EXAMINATION OF THE SOCIAL-ENVIRONMENTAL AND MOTIVATIONAL

PROCESSES OPERATING IN DANCE CONTEXTS: A SELF-DETERMINATION

THEORY APPROACH


by


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A thesis submitted to

the University of Birmingham

for the degree of

DOCTOR OF PHILOSOPHY


School of Sport, Exercise and Rehabilitation Sciences

University of Birmingham

April 2014

**ABSTRACT**

Grounded in the self-determination (SDT; Deci & Ryan, 1985, 2000) and achievement goal (Nicholls, 1989) theories this thesis had the broad aim of expanding current knowledge and theoretical understanding of motivational processes. This was achieved via four studies in dance addressing contemporary conceptual and methodological issues raised in the motivation literature. The studies aimed to progress the conceptualisation and measurement of key motivational constructs (i.e., the teacher-created motivational climate and motivation regulations) by examining their application in dance using quantitative and qualitative methods. Additionally, the studies aimed to enhance understanding of the motivational processes via which the motivational climate, as a multi-dimensional construct, predicts dancers' psychological well- and ill-being. Specifically, the mediating roles of basic psychological needs and motivation regulations between dancers' perceptions of the motivational climate and affective states were examined. Collectively the thesis supports the central features of the SDT framework, including Duda's (2013) conceptualisation of the motivational climate as multi-dimensional, and basic psychological need thwarting (as detailed in Bartholomew, Ntoumanis, Ryan, & Thøgersen-Ntoumani, 2011b). The studies in this thesis will substantiate the need for and inform theoretically-grounded interventions which aim to educate teachers in how they can support dancers' psychological well-being in a variety of dance settings.

## ACKNOWLEDGMENTS

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This thesis is comprised of the following four papers. Study design, data collection, statistical analysis and writing were conducted by Jennie Hancox. Dr Eleanor Quested and Professor Joan Duda advised on study design, data analysis and paper editing. Where listed, the secondary authors also advised on study design, data analysis and manuscript editing.

1. **Hancox, J., E.,** Quested, E., Viladrich, C., & Duda, J. L. (under review) Examination of the internal structure of the Behavioral Regulation in Sport Questionnaire among dancers. *International Journal of Sport and Exercise Psychology*

2. **Hancox, J., E.,** Quested, E., & Duda, J. L. (under review). Teachers' interpersonal style, basic psychological needs, motivations and affective states in recreational dance. *Research Quarterly in Exercise and Sport*

3. **Hancox, J., E.,** Quested, E., & Duda, J. L. (under review). Assessment of the content validity of the Perceived Motivational Climate in Sport Questionnaire-2 in dance settings: A think aloud approach. *Journal of Dance Medicine and Science*

4. **Hancox, J., E.,** Quested, E., Ntoumanis, N., & Duda, J. L. (in preparation). Teacher-created social environment, basic psychological need satisfaction/thwarting, and dancers' affective states during class: A diary study approach.

During the period of postgraduate study within the School of Sport, Exercise and Rehabilitation Sciences at the University of Birmingham, the following manuscripts and conference abstracts have been accepted for publication and/or presentation.

**Publication**

5. **Norfield, J. E.** & Nordin-Bates, S. (2012). How community dance leads to positive outcomes: a self-determination theory perspective. *Journal of Applied Arts and Health, 2*, 257-272.

**Conference Presentations**

6. Woodcock, C. & **Hancox, J. E**. (2013, November). *Introduction to mental skills for dancers.* Beyond the body: psychological tools for performance enhancement and well-being in dance, Birmingham, UK.

7. Quested, E., Woodcock, C., **Norfield, J. E.,** Cumming, J., & Duda, J. L. (2013, June). *Quality of participation and dancers' health.* Invited symposium presentation at the 18th Annual European College of Sport and Exercise Science Congress, Barcelona, Spain.

8. **Norfield, J. E.,** Quested, E., Duda, J. L., & Ntoumanis, N. (2013, June). *Dancers' daily experiences: a basic needs theory approach*. Paper presented at the 18th Annual European College of Sport and Exercise Science Congress, Barcelona, Spain.

9. **Norfield, J. E.** & Nordin-Bates, S. M. (2011, June). *Motivational climate, need satisfaction and psychological outcomes in community dance*. Paper presented at the 1st International Congress of Dance in Health, University of Bedfordshire, Bedford, UK.

10. Quested, E., Duda, J. L, Jauni , T., Castillo, I., Morales, V., Balaguer, I., Ntoumanis, N., Maxwell, J. P , Cumming, J., Nordin-Bates, S. M, & **Norfield, J. E.** (2011, June). Optimizing motivation and healthful engagement in dance: New research findings and applied implications, 1st International Congress of Dance in Health, University of Bedfordshire, Bedford, UK.

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**General Introduction**

Motivation is fundamental to all human endeavours as it is what energises, directs, and maintains behaviour (Deci & Ryan, 1985). Hence, motivation is critical to explaining why individuals think and behave as they do. In achievement contexts, such as sport and education, optimal motivation is critical for the attainment of goals, development of proficient performance, and sustained healthful engagement. Therefore, a large amount of research conducted in achievement contexts has focused on examining what motivation is, its antecedents or determinants, as well as what are the implications of 'differences' in motivation. Achievement contexts are ideal forums for studying motivational processes as individuals in such settings are constantly trying to energise and sustain their own and/or others' behaviour in pursuit of particular goals or outcomes. One achievement context in which motivation has important implications in terms of individuals' performance and well-being, but which has received scant attention, is dance.

Dance is an increasingly popular recreational and vocational pursuit (ACE, 2009). In the UK, dance is second only to football as the most popular activity among school children (Ofsted, 2005). It is estimated that there are in excess of 750,000 young people dancing each week in private dance schools[1] (ACE, 2009) and over 4.7 million people participating in community dance each year (FCD, 2002). At a vocational level, statistics suggest that approximately 17,000 young people take GCSE dance and around 10,000 students study dance at a higher education level in any one year (ACE, 2009).

As a varied physical activity accessible to all, regardless of age or ability, dance is uniquely positioned with the potential to engage a wide spectrum of people, including those who do not typically find competitive sport or exercise appealing (Youth Dance England,

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[1] Private dance schools are defined as organisations and/or individuals who offer dance tuition for profit. For example, a local dance school teaching a set syllabus regulated through an awarding body.

2010). Whether at the recreational or elite level, dance can provide opportunities for individuals to develop their artistic and physical skills and realise a sense of achievement and self-expression. Furthermore regular participation in dance also has the potential to result in a number of physical and psychological health benefits. For example, in children and young people, dance interventions have been found to result in physical benefits, such as, increased aerobic capacity (Connolly, Quin, & Redding, 2011; Blazy & Amstell, 2010), flexibility (Blazy & Amstell, 2010), and decreased Body Mass Index (Flores, 1995). In terms of psychological well-being, dance interventions have been shown to aid the development of children and young individuals' self-esteem (Daley & Buchanan, 1997; Connolly et al., 2011) and social relationships (Ells et al., 2009). For adults and older people, dance interventions have resulted in improved balance (Murcia, Kreutz, Clift, & Bongard, 2010; Wallmann, Gillis, Alpert, & Miller, 2009), reduced perceptions of pain (Murcia et al., 2010), and increased general physical fitness and ability (Hui, Chui, & Woo, 2009). Furthermore, adults have reported dance participation to elevate mood (Murcia et al., 2010), and enhance quality of life (Hui et al., 2009).

Considering the growing popularity and reported physical and psychological benefits of dance engagement, there has been increased political awareness of the valuable contribution dance can make to the healthy living agenda. In the UK over two thirds of the adult population (61% of males and 71% of females) do not meet the recommended daily guidelines for physical activity (BHF, 2012). Moreover, recent figures (HSCIC, 2014) show that 61.9% of adults and 28% of children (aged between 2 and 15) in the UK are overweight or obese. Hence, in order to tackle the growing obesity epidemic, encouraging regular participation in physical activities, such as dance, is a key focus of government agendas. For example, in 2006, the National Campaign for the Arts and Dance UK presented a 'Dance

Manifesto' to the current Minister for Culture, promoting the value of dance, and advocating for access to quality dance education for all young people. This act sparked the establishment of the first ever All Party Parliamentary Dance Group. Since, there has been a surge in political interest and involvement, with events and campaigns aimed at promoting dance and maximising the benefits that dance can bring society at every level. For example, a number of recent government initiatives, such as 'Be Active, Be Healthy: a plan for getting the nation moving' (DoH, 2009), 'Let's Dance with Change4Life' and 'Big Dance' have been developed to promote dance and increase participation rates in this activity. A clearer understanding of how to optimise individuals' motivation to engage and maintain participation in dance, therefore, is of great importance for ensuring the health of the nation. Such research may inform future interventions which aim to increase and maintain participation rates and ensure that individuals' accrue maximal benefits from their dance engagement.

Despite the potential benefits of dance, it has been recognised that individuals' experiences of dance participation, at both recreational and vocational levels, are not always optimal. Concerns about dancers' health and welfare have been recognised anecdotally and documented in research for many years. Previous research has reported vocational dancers to be at risk of a number of maladaptive physical and psychological outcomes such as eating disorders (e.g., Garner, Garfinkel, Rockert, & Olmsted, 1987; Arcelus, Witcomb, & Mitchell, 2013), low levels of self-esteem (Bettle, Bettle, Neumarker, & Neumarker, 2001), stress and performance anxiety (Marchant-Haycox & Wilson, 1992), burnout (Laws, 2005), and high attrition rates (Hamilton, Hamilton, Warren, Keller, & Molnar, 1997). In addition, the results of a nationwide survey by Dance UK (Laws, 2005) found that 80% of student dancers had been injured within the previous year.

A vocational dancer is a student dancer training to be a professional. Starting as young as 11 years of age, vocational dancers attend a specialised dance school in which they train for approximately 9 hours a day 5 or 6 days a week. These dancers take a variety of classes, have a number of different teachers, and have to master various styles/genres, for example, ballet, contemporary, tap, and jazz. Vocational dancers need to be highly motivated in order to sustain such an intense training regime. Examination of the motivational processes at play in such dance education environments and how they may impact vocational dancers' health and well-being is of critical importance in order to promote a healthier dance culture at elite levels.

However, concerns about dancers' well-being are not just confined to vocational dance contexts. Participation at a recreational level has also been found to be associated with negative physical and psychological outcomes. For example, Dworkin and Larson (2006) conducted focus groups with 55 adolescents taking part in sport, physical activity and/or dance at a recreational level and found them to report a variety of negative experiences, such as negative emotions, stress, and performance anxiety. Moreover, a systematic review (Hincapie, Morton, & Cassidy, 2008) of musculoskeletal injuries and pain in dancers revealed musculoskeletal injury to be an important health issue for dancers at all skill levels, not just for elite/student dancers. For example, Steinberg et al., (2012) screened 1336 young female recreational dancers (aged 8-16 years) and found 569 (42.6%) to be injured. Hence, examination of the possible causes of compromised health and well-being (as well as developing understanding of conditions that lead to adaptive engagement) of both recreational and vocational dancers is worthy of attention.

Considering the diverse nature of dance, its growing popularity, and the variability in associated health and well-being outcomes (with engagement being beneficial for some and

yet harmful for others), dance represents an interesting achievement context in which to examine the determinants and consequences of differential motivational processes. Furthermore, in order to continue to promote healthy and continued participation in dance at all levels, it is important to develop a strong body of reliable and valid research evidence that advances understanding of the mechanisms underpinning healthful dance involvement.

**Motivation: The 'Why' of Behaviour**

A brief review of the history of motivation research reveals a plethora of theories each with different definitions and approaches to interpret the construct (see Ford, 1992 for a review). In the past literature, the majority of motivational theories (e.g., Expectancy Theory, Vroom, 1964) have favoured a quantitative approach to motivation, emphasising higher amounts or intensity of energy and effort directed towards the targeted behaviour to yield more optimal outcomes. However, this conceptualisation of motivation as a unitary phenomenon does not take into account the different reasons underlying the behaviour (the why). In all domains of life, people are moved to act for a variety of reasons. For example, two dancers may be equally highly motivated to participate. However, one may engage in the activity out of curiosity and interest, alternatively, the other may be participating in order to gain approval from their parents. The amount of motivation does not vary but the underlying reasons, the quality of the motivation does.

Self-determination theory (SDT; Deci & Ryan, 1985, 2000) is a popular motivational framework which adopts a qualitative perspective. Deci and Ryan (1985) define motivation as the 'why' of behaviour; the internal and/or external forces that drive the direction, intensity, and regulation of behavioural engagement. SDT recognises that there are qualitatively different reasons underlying behavioural engagement and refer to these different

types of motivation as 'motivation regulations'. Deci and Ryan (2000) emphasise that the quality (or type) of motivation regulating behaviour is just as important as the quantity (or level) of motivation.

Originally two types of motivation were emphasised; intrinsic motivation (i.e., behaviour originates from within the person) and extrinsic (i.e., behaviour is initiated and controlled by external factors) (DeCharms, 1968; Deci, 1971; Heider, 1958). Thus, intrinsic motivation reflects an individual's natural tendency to strive for growth and seek new challenges. If an individual is intrinsically motivated then they voluntarily partake in an activity because they find the activity itself inherently interesting and enjoyable. Whereas, an individual who is extrinsically motivated may feel that they have to participate in an activity because the activity leads to some separable consequence, such as, rewards, avoidance of punishment, and/or gain of social approval (Ryan & Deci, 2000a).

Deci and Ryan's (1975) conceptualisation of extrinsic motivation builds on the perspectives of DeCharms (1968) and Heider (1958) by positing that there are various types of extrinsic motivation which vary with regards to their relative autonomy. Organismic Integration Theory (OIT; Deci & Ryan, 1985), one of five mini-theories within SDT, distinguishes between different types of extrinsic motivation (integrated, identified, introjected, and external regulations). Integrated regulation is the label applied to the most autonomous extrinsic regulation and is operating when an individual participates in an activity for reasons which are fully internalised and assimilated with the self. Although behaviour performed for integrated reasons is volitional and congruent with the individual's values and needs, it is still an extrinsic form of motivation because the behaviour is performed for its presumed instrumental value which is separate from the behaviour. Another form of extrinsic motivation which is considered to be more autonomous is identified regulation. An

individual's behaviour is identified when he or she personally values the benefits associated with the activity. Introjection is a relatively controlled form of regulation in which an individual feels pressure to engage in the activity for contingent consequences which are internal to the individual, such as to enhance or maintain feelings of self-worth or to avoid guilt. External regulation is the least autonomous form of extrinsic motivation as behaviours are performed in order to satisfy specific external demands or contingencies (e.g., to gain a reward or avoid punishment from significant others). Both intrinsic and extrinsic motivations are proposed to energise behaviour and together they stand in contrast to amotivation or being unmotivated, a state of having no intention to partake in the behaviour (Ryan & Deci, 2000a). Deci and Ryan (1985, 2000) theorised that motivation is best represented as a conceptual continuum of increasing self-determination (see Figure 1.1). Ryan and Connell (1989) tested the formulation of four of the five types of motivations posited by SDT (external, introjected, identified, and intrinsic) by investigating the reasons underlying students' achievement behaviours and prosocial behaviour. The four types of extrinsic motivations demonstrated a quasi-simplex pattern (the motivation regulations theoretically considered to be closer together on the continuum were more highly correlated than those more distant), providing evidence for an underlying continuum of autonomy (Ryan & Connell, 1989).
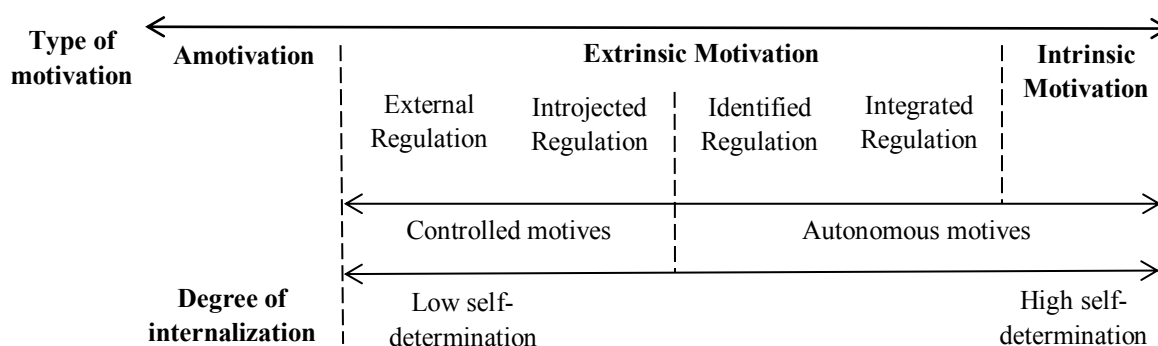


*Figure 1.1.* The self-determination continuum (Deci & Ryan, 2000)

The qualitatively various types of motivation differently predict cognitive, affective, and behavioural outcomes, and hence, are considered critical in understanding variation in individuals' performance, persistence, and experienced well- and ill-being. Previous studies in sport, education, and dance contexts have tested the tenets of SDT, generally finding the more autonomous regulations (e.g., intrinsic, integrated, & identified) to predict positive cognitive, affective, and behavioural outcomes, such as, high levels of positive affect (e.g., Quested & Duda, 2011a; Standage, Duda, & Ntoumanis, 2005), and persistence (Pelletier, Fortier, Vallerand, & Briere, 2001). Whereas, more controlled motivation regulations (e.g., introjected & external) and amotivation have generally been found to be related to indicators of maladaptive functioning and ill-being, such as, negative affect (e.g., Quested & Duda, 2011a; Standage et al., 2005), burnout (e.g., Hodge & Lonsdale, 2011), and dropout (e.g., Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002).

A limitation in the analysis of motivation in previous literature, centred on sport, education, or dance, is the inconsistency in how individuals' motivation regulations for engagement have been modelled. A variety of different scoring protocols have been developed and utilised with OIT-based measures of motivation. The most popular scoring protocol in the sport and education literature is the calculation of the Self-Determination Index (SDI, also known as the Relative Autonomy Index). The SDI is based on the quasi-simplex structure of the motivation regulations and involves creating a composite value by summing weighted scores according to their location on the self-determination continuum. An SDI is advantageous for researchers as it reduces the number of variables needed to represent the degree of self-determination underpinning individuals' motivation towards a particular activity, enabling examination of complex process models incorporating various antecedents and outcomes of motivation. However, it is important to acknowledge that the SDI is limited

and cannot be used to predict which self-regulatory style best predicts certain affective, cognitive, and/or behavioural outcomes (Vallerand, Pelletier, & Koestner, 2008).

Based on the theoretical premise that intrinsic motivation, internalisation, and amotivation are considered to be distinct types of motivation (Ryan & Deci, 2000a; Chatzisarantis, Hagger, Biddle, Smith, & Wang, 2003), some researchers in sport (e.g., Nien & Duda, 2008) and dance (Quested & Duda, 2011a) contexts have modelled intrinsic, extrinsic, and amotivation, separately. Alternatively drawing from the autonomous versus controlled motivation distinction (Deci & Ryan, 2008), other studies in sport (Hodge & Lonsdale, 2011) and dance settings (Balaguer, Castillo, Duda, Quested, & Morales, 2011) have modelled motivation by creating composite autonomous (i.e., intrinsic, integrated, & identified regulations) and controlled (i.e., introjected & external regulations) factors. In order to be able to compare findings across studies and contexts, there needs to be more consistency in the scoring protocols used. To date limited attention has been given to identifying the 'optimal' method of representing motivation scores (Wilson, Sabiston, Mack, & Blanchard, 2012). The scoring protocol employed has the potential to impact the interpretation of results and ensuing development of knowledge concerning motivation for engagement. For example, although often modelled as a composite (e.g., Balaguer et al., 2011; Hodge & Lonsdale, 2011) introjected and external regulations are considered in SDT to be theoretically different constructs and the implications of each regulation can only be understood if modelled separately. Hence, consideration as to the tenability and theoretical implications of using different scoring protocols to model the motivation regulations with OIT-based instruments is a useful line of enquiry.

**Self-determination Theory: An Organismic Dialectic Approach**

Most early theories of motivation have taken a deterministic and/or mechanistic approach, viewing humans as passive machine-like entities, driven by psychological needs, drives, incentives, and reinforces. In the 1960s, there was a shift towards social-cognitive theories which challenge the early theories, arguing that humans are not passive but active and purposive organisms who initiate action through the subjective interpretation of the achievement context. SDT takes an organismic dialectic approach; drawing from both traditional deterministic approaches to motivation and more contemporary social-cognitive perspectives and integrates these discrepant viewpoints into a comprehensive framework for understanding motivation. Similarly to deterministic approaches, SDT proposes that individuals have intrinsic psychological needs which must to be satisfied in order to energise behaviour.

Basic psychological needs theory (BPNT; Deci & Ryan, 2000), a mini-theory of SDT, posits that individuals have three basic nutriments, or innate psychological needs (namely, autonomy, competence, & relatedness) which are considered essential for optimal growth, development, and well-being. The basic psychological need for autonomy refers to individuals feeling a sense of control in and choice over their behaviours, which are perceived as self-initiated, volitional, and reflective of personal values (DeCharms, 1968). The basic psychological need of competence is satisfied when an individual feels they can successfully achieve their goals and function effectively in their environment (White, 1959). Finally, the basic psychological need for relatedness refers to the degree to which an individual feels meaningfully connected and cared for by significant others (Baumeister & Leary, 1995).

Ryan and Deci (2002) propose humans to be active, growth-orientated individuals with an inherent propensity for personality development and self-regulation of behaviour.

According to BPNT, humans' natural tendencies for growth and optimal functioning will be actualised so long as the basic psychological needs are satisfied. Hence, the satisfaction of basic needs for autonomy, competence, and relatedness are necessary for understanding both the content and process of goal pursuits and the conditions via which humans can most fully realise their potential (Deci & Ryan, 2000).

SDT (Deci & Ryan, 2000) also considers the negative consequences of individuals' basic psychological needs being thwarted. Deci and Ryan (2000) proposed that the thwarting or deprivation of the basic needs would lead to more controlled forms of motivation (i.e., introjected and external regulations) and negative affective, behavioural, and cognitive outcomes which may have severe consequences for individuals' health and well-being. However, due to the way in which basic psychological need thwarting has been operationalised and measured in the literature, there is a paucity of research evidence specifically examining the direct consequences of need thwarting. Up until 2011, low levels of need satisfaction were used by researchers as an indication of the basic needs being thwarted. However, Bartholomew, Ntoumanis, Ryan, and Thøgersen-Ntoumani (2011b) argued that low levels of basic need satisfaction do not equate to basic need thwarting as conceptualised by Deci and Ryan (2000). Low need satisfaction occurs when an individual feels that their basic needs are not being met. However, basic psychological need thwarting occurs when an individual's basic needs are obstructed or actively undermined within a given context (Bartholomew et al., 2011a). For example, a dancer might feel that her teacher is not giving her choices or options and hence, report low need satisfaction. However this is different to her autonomy being thwarted by the teacher intimidating her into performing a particular behaviour.

Bartholomew and colleagues (2011a) were the first to empirically distinguish between low levels of need satisfaction and need thwarting and directly assess the impact of need thwarting on diminished functioning and ill-being. Bartholomew et al. (2011a) (and subsequent studies; e.g., Bartholomew et al., 2011b) have reported a moderate negative correlation between basic need satisfaction and need thwarting supporting the notion that they are distinct constructs, as opposed to polar ends of the same continuum. They also have demonstrated that basic need satisfaction and need thwarting predict unique variance in targeted outcomes.

**What social-environmental conditions may predict variation in individuals' motivation and well-being and *how*?**

SDT theorises that humans are able to manage aspects of their basic needs and emotions via interactions with the social environment surrounding them (Deci & Ryan, 2000). Hence, a fundamental principle of SDT is the dialectic which occurs between integrative tendencies for growth and the specific social-contextual factors in which individuals operate. Thus, SDT can be used to explain *what* social-environmental conditions may nurture and/or hinder individuals' natural intrinsic propensity for optimal engagement, growth, and well-being and also *how*, by considering the processes via which this occurs (Ryan & Deci, 2000a).

SDT posits that there are specific social-contextual factors which support or thwart individuals' basic psychological needs and, in turn, influence the extent to which individuals' motivations are self-determined and ensuing psychological well-being (Deci & Ryan, 2000). Within this thesis, the role of the dance teacher and the extent to which they create an environment which is autonomy supportive, controlling, and/or, socially supportive (Deci & Ryan, 2000) is to be considered. It is important to note that it is not the actual social

environment that necessarily matters, but rather how an individual interprets it and what this interpretation means functionally in terms of supporting and or thwarting individuals' psychological needs (Deci & Ryan, 1987). Another theory which considers the role of significant others and the psychological environment which they create is achievement goal theory (AGT; Ames, 1992; Nicholls, 1989). AGT proposes that the motivational climate created by significant others can be more or less task- and/or ego-involving. Task and ego-involving dimensions have been included as part of the teacher-created social environment in SDT studies as they are considered to have important implications for individuals' basic need satisfaction/thwarting and motivational orientation (Duda, 2013). Each of the five dimensions of the teacher-created social environment mentioned above and examined within this thesis will be further explained and the relevant literature reviewed in more detail in the following sections.

**Autonomy Support and Control**

The majority of the research on the influence of social-environmental factors on intrinsic motivation has focused on the distinction between contexts which are autonomy supportive (i.e., promote choice) and those which are controlling (i.e., pressure individuals' towards particular outcomes) (Deci & Ryan, 1987). The autonomy support versus control distinction originated from Cognitive Evaluation Theory (CET; Deci 1975; Deci & Ryan 1980), another of SDT's mini-theories. CET focuses on the social-contextual factors that may undermine or enhance intrinsic motivation. According to CET, autonomy support and control lie at opposite ends of a bipolar continuum (Deci, Schwartz, Sheinman, Ryan, 1981). For example, a teacher can either acknowledge and encourage students' thoughts and feelings or actively dismiss them.

An autonomy supportive context is one in which a significant other, such as a teacher, acknowledges individuals' feelings and perspectives, and encourages choice and self-initiative (Black & Deci, 2000; Reeve, Bolt, & Cai, 1999). The benefits of significant others adopting an autonomy supportive teaching style have been well documented in the SDT literature across several contexts. For example, research in sport and physical education contexts has found that individuals who perceive their coach/teacher to be more autonomy supportive, experience more self-determined motivations (e.g., Amorose & Anderson-Butcher, 2007; Pelletier et al., 2001), and enhanced psychological well-being (e.g., Adie, Duda, & Ntoumanis, 2008).

An autonomy-supportive interpersonal style has been theorised (Ryan & Deci, 2000a) to enhance individuals' quality of motivation via the satisfaction of all three basic psychological needs. Within the context of vocational dance, the role of dancers' perceptions of autonomy support in predicting dancers' basic need satisfaction and, in turn, indicators of psychological well-being has been supported (e.g., Quested & Duda, 2010, 2011b; Quested, Duda, Ntoumanis, & Maxwell, 2013). For example, using a cross-sectional design, Quested and Duda (2010) found that dancers who perceive their teacher to generally (i.e., over the past month) be more autonomy supportive were more likely to experience higher levels of positive affect and self-esteem and lower levels of negative affect, social physique anxiety, and body dissatisfaction. Taking a longitudinal approach, Quested and Duda (2011b) found that decreases in dancers' perceptions of autonomy support over the school year predicted increases in burnout. In support of BPNT, the relationship between perceptions of autonomy support and experiences of burnout was mediated by vocational dancers' reported autonomy, competence and relatedness satisfaction. Hence, these findings suggest that it is important to sustain autonomy supportive environments throughout the school year in order to prevent

burnout. Finally, Quested and colleagues (2013) examined vocational dancers' daily experiences of autonomy support and basic need satisfaction and how this influences variation in reported well-being within a person over time (within-person variability).The findings of Quested et al. (2013) support BPNT at the within-person level and highlight the importance of daily provision of autonomy support for dancers' day-to-day experiences of well-being.

A pertinent finding across a number of studies with dancers (e.g., Quested & Duda, 2010, Quested et al., 2013) is that perceptions of autonomy support explained less variance in indices of ill-being (e.g., negative affect and emotional and physical exhaustion) compared to well-being. Moreover, in some cases (e.g., Quested & Duda, 2010) autonomy support did not even predict indices of ill-being (i.e., negative affect and exhaustion). Hence, it may be that other features of the social environment (such as teachers' controlling behaviours) facilitate prediction of, and explain more variance in indicators of ill-health.

A controlling interpersonal style is one in which a significant other is authoritarian and coerces individuals' to think and behave in certain ways (Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2010). Controlling contexts are theorised (Deci & Ryan, 1987) to induce a shift in perceived locus of causality from internal to external. Hence, the loss of control undermines and thwarts individuals' basic needs and self-determined motivations, contributing to the development of more controlled motivations (i.e., introjected and external regulations) and experiences of ill-being (Deci & Ryan, 2000).

To date, the relationships between interpersonal control, basic need thwarting, and indices of ill-being have been understudied in the SDT research literature. This may be due to limitations in how the constructs of teacher/coach control and basic need thwarting have been measured in past literature. As previously mentioned, up until 2011 no research study had empirically distinguished between low levels of need satisfaction and need thwarting. In terms

of the measurement of control, there has also been controversy over whether behavioural control is the exact opposite of autonomy support (e.g., teachers are either autonomy supportive or controlling) as theorised in CET. A growing body of research evidence in the sport (Bartholomew et al., 2010; Bartholomew et al., 2011a; Pelletier et al., 2001), and education (Assor, Kaplan, Kanat-Maymon, & Roth, 2005; Tessier, Sarrazin, & Ntoumanis, 2008) literature has reported a relatively modest and negative correlation between perceived autonomy supportive and controlling interpersonal styles, indicating them to be distinct constructs. Hence, teachers may demonstrate a variety of autonomy supportive and controlling behaviours simultaneously and to differing extents (Bartholomew et al., 2011a). For example, when asking a dancer to do something a teacher may explain the reasoning behind their request but then be less friendly with dancers if they do not see things his or her way. In order to better understand and differentiate the mechanisms by which social-environmental factors may impact motivation and well- and ill-being it is important that research measures both autonomy supportive and controlling interpersonal styles concurrently, considering them as separate constructs.

Although previous studies in education (Assor et al., 2005; Tessier et al., 2008) and sport (e.g., Pelletier et al., 2001) contexts have examined the effects of autonomy support and control exhibited by significant others on motivation and well-being, the measures via which teacher/coach control have been assessed has been limited and inconsistent (see Bartholomew, Ntoumanis, & Thøgersen-Ntoumani, 2009 for a review).  A comprehensive multi-dimensional measure of coaches' controlling interpersonal style in sport contexts (the Controlling Coach Behaviors Scale, CCBS, Bartholomew et al., 2010) has only relatively recently been developed and validated.

BPNT-framed studies in sport contexts (employing the CCBS) have supported a model in which athletes' perceptions of their coaches' autonomy supportive behaviours primarily predicted  basic need satisfaction and, in turn, indices of well-being (i.e., positive affect, vitality) (Balaguer et al., 2012; Bartholomew et al., 2011a, 2011b). In contrast, perceptions of coach controlling behaviours predicted athletes' need thwarting and, in turn, indicators of compromised health (i.e., disordered eating, burnout, depression, negative affect). Collectively, Balaguer and colleagues' (2012) and Bartholomew et al.'s (2011a, 2011b) studies suggest that when research examines predictors of ill-being, coach control and basic psychological need thwarting predict a larger amount of variance in maladaptive outcomes compared to autonomy support and basic need satisfaction.

To date, no research with dancers has examined the concomitants of controlling teacher behaviours and/or basic need thwarting. This is surprising considering the stereotype of a dance teacher is typically that of a demanding, autocratic figure (e.g., Van Rossum, 2004). In the media, dance teachers are often portrayed as using highly controlling and demanding teaching methods. An example is the 2010 film 'Black Swan' which portrayed the ballet profession as rife with rivalry, control, and extreme psychological pressures. Furthermore, more recently there have been a number of documentaries, such as 'Agony and Ecstasy: A Year with English National Ballet' (aired on BBC in 2011) and 'First Position' (released in 2012) which also provide an insight into the darker controlling sides of dance teaching. Controversial media portrayals are supported by anecdotal reports, such as that of a former professional dancer (Hamilton, 1997), who describes dance teachers as being feared figures that often exert control and humiliate dancers in public. Furthermore, research reports (Hamilton et al., 1997) have also reinforced such claims with 48% (of 1000 dancers surveyed) reporting having been unjustly humiliated in class and 24% having had a teacher who

expected them to dance on a serious injury. In order to explain the causes of diminished functioning in dancers therefore, it seems essential that future research examines both the 'lighter' and 'darker' sides of dance. For example, subsequent SDT-grounded research examining adaptive and maladaptive outcomes in dance contexts should assess both autonomy supportive and controlling teacher behaviours, and the satisfaction and thwarting of the basic psychological needs.

**Social Support**

Another related dimension of the teacher-created social environment considered by Deci and Ryan (2000) to be important for the satisfaction of the basic needs and fundamental for internalisation is social support (also referred to as interpersonal involvement; Skinner & Edge, 2002). Significant others, such as teachers, are socially supportive when they express empathy and authentic interest in the individual and demonstrate that they care about and value them (Reinboth, Duda, & Ntoumanis, 2004; Sarason, Sarason, Shearin, & Pierce, 1987). Previous research in sport (e.g., Reinboth et al., 2004) and dance (Quested & Duda, 2009b) contexts has found social support to be a determinant of basic need satisfaction and resulting motivation and well-being. Of the three basic needs, social support has been proposed (Deci and Ryan 2000; Ryan and Solky, 1996) and found (Reinboth et al., 2004) to satisfy the need for relatedness in particular. To date, only one study with vocational dancers (Quested & Duda, 2009b) examined the inter-relationships between dancers' perceptions of social support, basic need satisfaction and psychological outcomes (i.e., affective states, social physique anxiety (SPA), emotional and physical exhaustion). Analyses revealed perceptions of social support to positively predict dancers' basic need satisfaction (when modelled as a composite of all three basic needs) and, in turn, positively predict indicators of dancers' well-

being and negatively predict indicators of ill-being. Need satisfaction fully mediated the association between social support and dancers' reported positive affect, negative affect and SPA. These findings suggest that basic need satisfaction may be a central psychological mechanism linking perceptions of social support with stress-related emotional responses in dancers.

**Task- and Ego-Involving Dimensions**

A theoretical approach which is conceptually related to SDT is achievement goal theory (AGT; Ames, 1992; Nicholls, 1989). Similarly to SDT, AGT proposes that an important prerequisite for motivated behaviour is a desire to feel competent (Nicholls, 1984). According to AGT, individuals perceive their competence in achievement settings in relation to two goal perspectives; task- and ego-involvement. Individuals who operate a more task-involved goal perspective perceive themselves as successful when they try their best and improve their performance (Duda, 2001). In contrast, more ego-involved individuals compare their performance to others and feel successful only when their performance is superior (Nicholls, 1989).

AGT proposes that there are a number of factors which influence whether an individual adopts a more task- or ego-involved goal orientation in different settings. An important factor is the prevailing goal structure individuals perceive to be operating in situations, more widely known in the literature as the 'motivational climate'. Ames (1992) conceptualised the motivational climate as represented by a hierarchical framework, with two higher order dimensions (Task-Involving and Ego-Involving features). A task-involving climate is one in which the teacher positively reinforces effort and improvement, cooperative learning, and each individual has an important role (Ames, 1992; Newton, Duda, & Yin,

2000). Encouraging self-referenced judgements of ability promotes the adoption a more task-focused goal involvement in which mastery and improvement are considered criteria for success. In contrast, an ego-involving climate is one in which the teacher gives unequal recognition, punishes mistakes, and encourages rivalry (Ames, 1992; Newton et al., 2000). As a result of the focus on normative comparison when construing levels of competence, over time ego-involving motivational climates foster the development of athletes/students ego-focused goal involvement.  Primarily and strongly ego-involved individuals' compare themselves to others and feel successful only when their performance is superior (Nicholls, 1989).

Numerous studies, grounded in SDT, in sport (e.g., Reinboth & Duda, 2006), educational (e.g., Meece, Anderman, & Anderman, 2006; Ntoumanis & Biddle, 1999), and dance (e.g., Carr & Wyon, 2003; Quested & Duda, 2009a, 2010) contexts have included task- and ego-involving dimensions as relevant facets of the teacher-created social environment. In support of the tenets of AGT and SDT, task-involving climates have been found to positively predict basic need satisfaction (e.g., Standage, Duda, & Ntoumanis, 2003; Quested & Duda, 2010) and positive outcomes, such as, greater self-determined motivation for physical education in students (e.g., Standage et al., 2003) and higher levels of positive affect in vocational dancers (e.g., Quested & Duda, 2010). Ego-involving motivational climates have been found to be negatively associated with basic need satisfaction (e.g., Standage et al., 2003; Quested & Duda, 2010) and maladaptive outcomes, such as, lower levels of self-determined motivation and greater intentions to dropout in athletes (Sarrazin et al., 2002).

**Multi-dimensional Teacher-Created Social Environment**

Since the mid-1990s, researchers (e.g., Duda, Chi, Newton, Walling & Catley, 1995; Seifriz, Duda, & Chi, 1992) have examined conceptual and empirical links between key concepts in AGT and SDT. Studies in sport (e.g., Reinboth & Duda, 2006; Reinboth et al., 2004), physical education (e.g., Standage et al., 2003), and dance (e.g., Quested & Duda, 2009a, 2010) contexts have measured facets of the social environment underscored within both AGT and SDT. For example, Quested and Duda (2009a, 2010) measured both dancers' perceptions of teacher autonomy support and task- and ego-involving behaviours independently in the same study. Researchers have done this in order to create a more comprehensive picture of the social-environmental features which may hold implications for individuals' need satisfaction.

Furthering the integration of SDT and AGT, Duda (2013) proposed the consolidation of the prominent social-environmental dimensions which are motivationally relevant and have important implications for the satisfaction and/or thwarting of individuals' basic needs. Duda (2013) posits that the motivational climate can be more or less empowering (autonomy supportive, socially supportive, and task-involving) and/or disempowering (controlling and ego-involving) depending on which social-environmental characteristics are emphasised. A quick note with regards to the use of the term 'motivational climate'. Although originally coined by Ames (1992) and conceptualised in AGT to consist of just task- and ego-involving dimensions, we are moving towards a broader consideration of the motivational climate which also includes other motivationally relevant dimensions (i.e., autonomy support, social support and control). Thus the terms motivational climate and teacher-created social environment will be used interchangeably throughout the thesis.

A motivational climate which is more empowering is proposed to promote optimal engagement and psychological well-being via the satisfaction of the three basic psychological needs. In contrast, disempowering teacher climates are proposed to predict maladaptive psychological functioning via the thwarting of the basic psychological needs. Future research, pulling from Duda's (2013) multi-dimensional conceptualisation of the motivational climate (i.e., considering both empowering and disempowering dimensions) would advance understanding of *what* social-environmental conditions may predict variation in individuals' motivation and well-being and *how*. Figure 1.2 illustrates the central tenets of the SDT framework as conceptualised by Deci and Ryan (2000) and adapted to include Duda's (2013) conceptualisation of the multi-dimensional motivational climate and basic psychological need thwarting (as detailed in Bartholomew et al., 2011b).
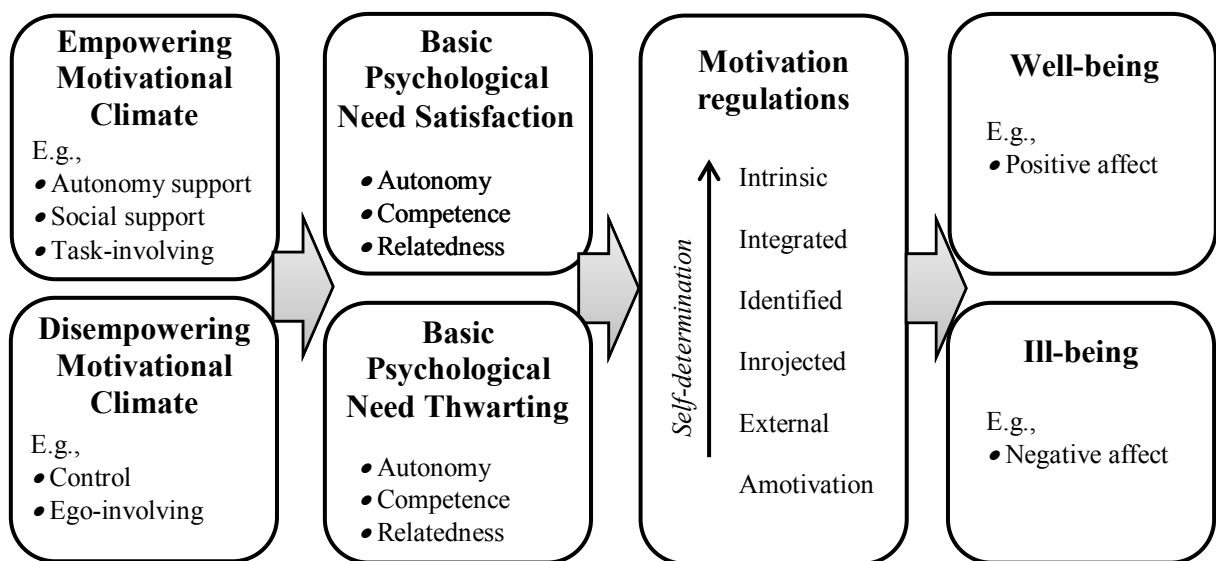


*Figure 1.2*. The central features of the self-determination theory framework (Deci & Ryan, 2000) adapted to include Duda's (2013) conceptualisation of the multi-dimensional motivational climate and basic psychological need thwarting (as detailed in Bartholomew et al., 2011b)

**Measurement and Conceptualisation of SDT Constructs in Dance Contexts**

Research investigating the social environment created in dance (from an AGT and/or SDT perspective) is only in its infancy; as a result dance-specific measure of the motivational climate has not yet been developed. Previous research involving dancers (Carr & Wyon, 2003; Nordin-Bates, Quested, Walker, & Redding, 2012; Quested & Duda, 2009a, 2009b, 2010, 2011a; 2011b; Quested et al., 2013; Walker, Nordin-Bates, & Redding, 2011) has relied on adapted measures of the perceived social environment that were originally developed for use in other contexts (e.g., the Perceived Motivational Climate in Sport Questionnaire-2 [PMCSQ-2; Newton et al., 2000], Health Care Climate Questionnaire [HCCQ; Williams, Grow, Freedman, Ryan, & Deci, 1996], and the Social Support Questionnaire [SSQ; Sarason et al., 1987). However, psychometric limitations with the modified versions, which may be attributable to the applicability of item content to dance, have been noted (Quested & Duda, 2009a, 2010). Hence, investigation into the validity of the current measures of the perceived social environment in dance would be valuable. In particular, Quested and Duda (2010) have asserted that researchers should proceed with caution when using the PMCSQ-2 with dancers. The PMCSQ-2 (adapted for dance by Quested & Duda, 2009a) has been employed in a variety of dance settings (e.g., Quested & Duda, 2010; Nordin-Bates et al., 2012; Norfield & Nordin-Bates, 2012), however, the content validity of the PMCSQ-2 with dancers has been questioned (Quested & Duda, 2010). In particular, Quested and Duda (2010) report psychometric issues with the items from the intra-team rivalry subscale and question whether the wordings of the items in the PMCSQ-2 capture the construct of intra-team rivalry as it is construed in dance settings. In order to confidently examine key social-environmental predictors of dancers' optimal development, performance, and well-being, it is of critical importance that the measure of the motivational climate in dance is robust.

Despite a plethora of research examining the antecedents and outcomes of quality motivation in sport and education contexts; motivation for dance engagement has received little attention. This may in part be due to the lack of a dance-specific measure of motivation. Previous research with vocational dancers (Balaguer et al., 2011; Quested & Duda, 2011a), grounded in SDT, have relied on adapted versions of measures designed for use in competitive sport contexts (e.g., the Sport Motivation Scale [SMS, Pelletier et al., 1995]; Behavioral Regulations in Sport Questionnaire [BRSQ, Lonsdale, Hodge, & Rose, 2008]). For example, Quested and Duda (2011a) employed the SMS to examine the relationships among vocational dancers' perceptions of autonomy support, motivation regulations, and self-esteem and body-related concerns. However, Quested and Duda (2011a) report psychometric limitations with the SMS and advocate that future research identifying a more effective assessment of dancers' motivational regulations in line with OIT is needed. Initial psychometric testing of the Spanish adaption of the BRSQ with vocational dancers seems promising (Viladrich, Torregrosa, & Cruz, 2011), however, the reliability and validity of the English version of the BRSQ (Lonsdale et al., 2008; Lonsdale, Hodge, & Rose, 2009) has yet to be examined in any dance context. Furthermore, the ability for the measure to accurately discriminate between the integrated and identified regulations and between the introjected and external regulations has been questioned (Holland, Sharp, Woodcock, Cumming, & Duda, 2010; Lonsdale et al., 2008, 2009; Mouratidis, Lens, & Vansteenkiste, 2010).

Theoretical development is largely associated with advances in measurement as research results are only as valid as the measures used. Hence, in dance contexts, examination of the antecedents and consequences of individuals' quality of motivation will only be possible if there is a valid measure with which to tap dancers' motivation regulations from an OIT perspective. When employing measures with new subgroups or in different contexts it is

critical to access whether the measure is viable for the new target population of interest, as a test may not always be valid across all situations (Messick, 1995). Therefore, examination of the internal structure and the tenability of different scoring protocols with the English version of the BRSQ among dancers is considered a worthy pursuit in order to advance the measurement of motivation in dance contexts.

**Aims and Purpose of the Thesis**

Grounded in SDT and pulling from AGT, this thesis is comprised of a series of studies with dance populations. Studies were conducted with a heterogeneous sample of dancers from a variety of ability levels and dance settings. This approach was taken in order to develop a greater understanding of how to promote healthy and continued participation in dance at all levels. As a body of research, these studies had a broad aim of expanding current knowledge and theoretical understanding of motivational processes. This aim was addressed by investigating key conceptual and methodological issues apparent in the dance as well as the wider SDT literature. Such knowledge and understanding can be used in the future to contribute to the development and testing of interventions that will serve to optimise dancers' health and motivation.

More specifically, the thesis aimed to:

1. Explore the conceptualisation and measurement of key motivational constructs (i.e., the teacher-created social environment and motivation regulations) and their applications in dance settings.

2. Investigate the motivational processes (in particular the mediating roles of basic need satisfaction and need thwarting, and motivation regulations) linking social-

environmental factors (such as the teacher-created social environment) to dancers'
affective states.

Study 1 addressed aim 1 of the thesis and explored current limitations with the
conceptualisation and measurement of individuals' motivation regulations. Despite the
popularity of dance, there is a paucity of research examining the correlates of dancers'
motives underlying engagement. This may be due to there currently being no valid and
reliable SDT-based measure of motivation validated with dancers. Furthermore, within the
sport, physical education, exercise, and dance literature there is inconsistency in how
individuals' motivation regulations for engagement are statistically modelled. This has
implications for the interpretation of results and the testing and advancement of theory.
Hence, the purpose of study one was to firstly examine the utility of the BRSQ (Lonsdale et
al., 2008) for measuring motivation in dance contexts and secondly, to explore the tenability
of using different scoring protocols to model the motivation regulations.

Building on study 1 and extending past research in dance, sport, and physical activity
contexts, study 2 addressed the second aim of the thesis and explored the psychosocial
mechanisms linking social-environmental factors (such as the teachers' interpersonal style) to
recreational dancers' affective states. The main aim of study 2 was to test a hypothesised
SDT-based model in which dancers' perceptions of their teachers' interpersonal style
(autonomy supportive and controlling behaviours) predict dancers' basic need satisfaction
and/or thwarting, which in turn, both directly and indirectly (via the motivational regulations)
predict dancers' reported positive affect and negative affect. The mediating role the basic
needs between dancers' perceptions of teacher interpersonal style and dancers' affective
states, and the mediating role of the motivation regulations between basic need

satisfaction/thwarting and dancers' positive and negative affect were examined. Study 2 builds on previous research in dance contexts as it is the first to examine the predictive utility of dancers' perceptions of controlling teacher behaviours and basic psychological need thwarting. Furthermore, this study is the first in any context to explore the mediating role of the motivational regulations (when modelled independently) between basic psychological need thwarting and individuals' affective states. Examination of the predictive utility attributable to each of the motivation regulations may enhance understanding of the possible causal mechanisms for variability in individuals' quality of motivation and emotional experiences in dance. Such knowledge can be used to promote positive participation and circumvent compromised, unhealthy engagement in dance via the application of motivational theories in dance teaching.

Study 3 builds on study 2 by drawing from AGT and considering other motivationally relevant dimensions of the motivational climate (i.e., task- and ego-involving features of the climate). This study further qualifies the relevance of these important motivationally relevant dimensions, thus, adding to the rationale to consider the climate as multidimensional in study 4. Study three addresses aim 1 of the thesis by employing a cognitive interviewing technique to examine the content validity of the 33-item PMCSQ-2 (as adapted for dance by Quested & Duda, 2009a) across a variety of dance populations. Furthermore, considering inconsistencies in previous research (Quested & Duda, 2009a, 2010; Nordin-Bates et al., 2012; Norfield & Nordin-Bates, 2012), study 3 aimed to determine whether the sub-dimensions of task- and ego-involving motivational climates captured in the subscales of the PMCSQ-2 are relevant and meaningful in dance contexts.

Building on studies 2 and 3, and previous research grounded in BPNT (Deci & Ryan, 2000), study 4 draws from Duda's (2013) conceptualisation of the multi-dimensional

motivational climate which consolidates the prominent social-environmental dimensions emphasised in SDT and AGT. Furthermore this study advances understanding of the underlying processes by being the first to examine, using a diary methodology, the mediating role of basic need thwarting at the within-person level. Hence the aims of study 4 were twofold; firstly to examine whether dancers' perceptions of empowering and disempowering teacher climates in dance class predict changes in dancers' affective states during class. Secondly, the study aimed to examine whether dancers' experiences of basic need satisfaction and basic need thwarting in class mediate the relationships between dancers' perceptions of empowering and disempowering teacher climates and changes in affective states during class. The findings of study 4 facilitate a greater understanding of the social-psychological mechanisms that may underpin fluctuations in individuals' optimal and compromised functioning within classes. This knowledge may be used in the future contribute to the development and testing of interventions to promote healthy, optimal engagement in dance on a daily basis.

**Examination of the internal structure of the Behavioral Regulation in Sport**

**Questionnaire among dancers**

**Abstract**

Objectives: Within the sport, physical education, and dance literature there is inconsistency in how individuals' motivation regulations for engagement are statistically modelled which has implications for the interpretation of results and the testing and advancement of theory. Furthermore, despite the popularity of dance, there is a paucity of research examining correlates of dancers' motivation due to there being no dance-specific measure of motivation. Hence, the purpose of this study was twofold; firstly to examine the utility of the Behavioral Regulations in Sport Questionnaire (BRSQ; Lonsdale et al., 2008) for measuring motivation in dance contexts and secondly, to explore the tenability of using different scoring protocols to model the motivation regulations.

Method: To address these aims a comprehensive examination of the hypothesised internal structure of the BRSQ when completed by recreational ($N = 344$) and vocational ($N = 868$) dancers was conducted.

Results: The data demonstrated good fit to the BRSQ and full scalar measurement invariance was achieved across dance level (recreational and vocational) and age ($< 18$ & $\geq 18$ years of age). Issues of discriminant validity were evident between introjected and external regulation subscales.

Discussion: Findings support the use of the six-factor BRSQ in dance contexts. The tenability of employing alternative scoring protocols for modelling the motivation regulations is discussed.

*Keywords:* Dance Psychology; Motivation; Self Determination Theory; Measurement; Scale Validity

Dance is a popular recreational and vocational activity, being second only to football as the most popular activity of school children in the UK (Ofsted, 2005). Despite a plethora of research examining motivation in sport and physical activity contexts, there has been a paucity of research examining determinants and consequences of motivation for dance engagement. The term 'motivation' can be understood to capture the 'why' of behaviour and is defined as the internal and/or external forces that drive the direction, intensity and regulation of behavioural engagement (Deci & Ryan, 1985). Self-determination theory (SDT, Deci & Ryan, 1985) is a popular theory of human motivation which has advanced understanding of motivation as a multi-dimensional construct. Currently no dance-specific measure of motivation exists. However, recent research with vocational (Balaguer et al., 2011) dancers in Spain has utilised the Spanish adaption (Viladrich et al., 2011) of the Behavioral Regulation in Sport Questionnaire (BRSQ; Lonsdale et al., 2008). The BRSQ was designed to tap athletes' motivation regulations for engagement in competitive sport, from an SDT perspective. In reference to work with dancers, Quested and Duda (2010) advise that caution should be taken when employing measures originally designed and validated for use with other populations. When employing measures with new subgroups or in different contexts it is critical to first assess whether the measure is viable for the new target population of interest. Despite growing use of the BRSQ in dance contexts, the factorial and discriminant validity of the measure is yet to be examined in this setting.  Thus, the first aim of this study was to test the validity of the BRSQ as a measure of motivation in dance contexts. Furthermore, in the sport, dance, and physical activity literature there is inconsistency in how individuals' motivation regulations for engagement are statistically modelled which has implications for the interpretation of results and theory testing. Hence, the second purpose of

this study was to explore the tenability of using different scoring protocols to model the motivation regulations.

**Self-determination Theory: The Conceptualisation of Motivation**

SDT (Deci & Ryan, 1985, 2000) posits that motivation is best represented as a conceptual continuum of increasing self-determination, whereby the regulations which are theoretically closer together on the continuum are more highly positively correlated than those further away (Ryan & Connell, 1989). For definitions of each of the motivation regulations please refer to Chapter 1 (p.7). SDT (Deci & Ryan, 1985) originally focused on the intrinsic versus extrinsic distinction. This approach was based on the theoretical foundation that intrinsic motivation, extrinsic motivation and amotivation are distinct processes (Ryan & Deci, 2000a; Chatzisarantis et al., 2003). However, the concept of internalisation along with the different forms of extrinsic regulations has led to a shift in the SDT literature from the intrinsic-extrinsic distinction to one of autonomous verses controlled motivation (Deci & Ryan, 2008). Intrinsic, integrated, and identified regulations are considered to be more autonomous motives because they regulate behaviour through an internal locus of control and the individual experiences a sense of choice and volition over behaviours (Ryan & Deci, 2006). In contrast, introjected and external regulations are considered controlled motives as they characterise behaviours which are enacted for instrumental reasons, such as, to please others, acquire rewards, or to avoid negative outcomes (Moller, Deci, & Ryan, 2006). The distinction between autonomous and controlled motives is important as they have different consequences for individual functioning and psychological well-being. For example, more autonomous regulations are predictive of adaptive functioning and positive cognitive, affective, and behavioural outcomes in sport, educational, and dance settings, such as, high levels self-esteem (Quested & Duda, 2011a), positive affect (Standage et al., 2005), and

persistence (Pelletier et al., 2001). Whereas, more controlled motivation regulations are related to indicators of maladaptive functioning and ill-being, such as, negative affect (Standage et al., 2005), burnout (Balaguer et al., 2011; Hodge & Lonsdale, 2011), and dropout (Sarrazin et al., 2002).

**The Behavioral Regulation in Sport Questionnaire**

The BRSQ was developed in response to limitations of previous contextual measures of sport motivation and most specifically, the Sport Motivation Scale (SMS; Pelletier et al., 1995). A key limitation of the SMS is the lack of an integrated regulation subscale. The BRSQ addresses this issue by including a subscale to capture athletes' integrated motives for engagement (Deci & Ryan, 1985). Furthermore, the SMS has been criticised for lacking internal consistency and factorial validity (see Lonsdale et al., 2008 for a review). In previous studies in sport (e.g., Nien & Duda, 2008) and dance (Quested & Duda, 2011a) contexts, problems with the factor structure of the SMS has led to the identified, introjected, and external regulations being modelled using a composite extrinsic motivation score. That is, the ability of the SMS to adequately capture the separability of each extrinsic motivation regulation has been highlighted as a major issue of concern (Lonsdale et al., 2008).

Mallett, Kawabata, Newcombe, Otero-Forero, and Jackson (2007) created a revised version of the SMS, the SMS-6. The authors modified items from the SMS based on statistical evidence and added a subscale measuring integrated regulation. Mallett et al. (2007) report the revised SMS-6 to be preferable to the original SMS. However, subsequent research (Kawabata & Mallett, 2013) has found the six-factor structure to not adequately fit the data, with cross-loadings of two items responsible for a lack of discriminant validity between the more autonomous regulations (i.e., intrinsic, integrated, & identified regulations).

In parallel to the work of Mallett et al. (2007), Lonsdale and colleagues (2008) developed a new pool of items from which the BRSQ was created. Initial evidence for the factorial validity, nomological validity, internal consistency, and test-retest reliability of the BRSQ with elite and non-elite athletes appeared promising (Lonsdale et al., 2008, 2009). In comparison to the SMS and the SMS-6, Lonsdale and colleagues (2008) report the factorial validity and internal reliability of the BRSQ to be equal or in some cases even superior.

Despite initial support for the BRSQ, psychometric issues are still evident. The BRSQ was originally designed and tested with individuals 14-58 years of age (Lonsdale et al., 2008). However, Holland et al. (2010) found the content validity of some of the items (in particular those designed to measure integrated motives) to be poor when employed with young athletes (aged 14-17 years). Holland and colleagues (2010) suggest that children may not have the cognitive or psychosocial development to accurately respond to certain items within the integrated regulation subscale. In contrast, a study examining the psychometric properties of the Spanish adaption of the BRSQ (Viladrich et al., 2011) conducted cognitive interviews and found athletes as young as 12 years of age to understand the integrated items. As research evidence in relation to the usability of the BRSQ with young athletes is equivocal, further examination is needed. Therefore, the current study will test whether the BRSQ is invariant across ages by comparing the factorial validity of the measure for young adolescents and adults.

A further concern regarding the BRSQ is that support for the discriminant validity. Some studies have reported the measure to have good discriminant validity (Assor, Vansteenkinste, & Kaplan, 2009; Viladrich et al., 2011); however, others have found a lack of discrimination between the integrated/identified and introjected/external subscales (e.g., Holland et al., 2010; Lonsdale et al., 2008, 2009; Mouratidis et al., 2010). It has been

recommended (Vallerand, Donahue, & Lafreniere, 2012) that further research is needed to examine if the BRSQ can discriminate all six self-regulatory styles as outlined by Deci and Ryan (2000). This study will contribute further evidence on the discriminant validity of the BRSQ and explore whether issues of discriminant validity are context specific by employing the measure with a sample of dancers.

It is important to note that in 2013, Pelletier et al. published another revised version of the SMS, the SMS-II. The SMS-II was developed to address limitations with both the original SMS and the SMS-6. Pelletier and colleagues (2013) report the SMS-II to perform as well as or better than the original SMS scale and to be superior to the BRSQ. In response, Lonsdale, Hodge, Hargreaves, and Ng (2014) compared evidence presented in Lonsdale et al.'s (2008) and Pelletier et al.'s (2013) papers and concluded that both the SMS-II and the BRSQ have relative strengths and weaknesses. Both the BRSQ and SMS-II report that scores were internally consistent. In terms of factorial validity, Lonsdale et al. (2013) argue that the BRSQ met Hu and Bentler's (1999) criteria for excellent model fit (Lonsdale et al., 2008); however, evidence for the SMS-II was mixed, with model fit falling below the suggested cut-off scores for excellent fit in some instances. With regards to discriminant validity, neither measure produced scores that conformed perfectly to a simplex structure. The BRSQ appeared to discriminate better among the autonomous motivation subscales scores, whereas, the SMS-II more clearly differentiated between the controlled motivation scores. Lonsdale et al., (2014) concluded that further research is needed to address limitations with both measures.

In the present study the BRSQ was chosen as the measurement of interested because the SMS-II was not available at the time of conducting the study. Furthermore, the BRSQ is a popular measure of motivation (in terms of frequency of use and validation) which has been translated into over nine different languages and a version adapted for use with young athletes

aged 9-15 years of age has demonstrated metric invariance across 5 European countries (Viladrich et al., 2013). Initial support for the BRSQ with Spanish vocational dancers appears promising (Balaguer et al., 2011); however, the English version of the measure is yet to be validated with dancers in any context.

**Scoring Protocols**

It is important to note that the way the motivation regulations have been statistically modelled in the SDT literature has varied. In the current study, four different scoring protocols were considered. Mullan, Markland, and Ingledew (1997) suggest averaging individuals' responses to items comprising each subscale to create a score for all self-regulatory styles. Thus, the first approach, underpinned by Deci and Ryan's (1985) distinction between the six different self-regulatory processes, is to model the motivational regulations independently. Modelling the motivational regulations independently allows researchers to identify which self-regulatory styles best predict certain affective, cognitive, and/or behavioural outcomes, explore changes in individuals' quality of motivation and examine the impact these changes may have on specific outcomes overtime (Pelletier & Sarrazin, 2007).

Alternative scoring protocols have been developed to reduce the number of variables representing the degree of self-determination underpinning behavioural engagement. Considering internalisation of extrinsic motivation as a distinct process (Ryan & Deci, 2000a; Chatzisarantis et al., 2003), some studies in sport (e.g., Nien & Duda, 2008) and dance (Quested & Duda, 2011a) contexts have utilised a model with a higher order extrinsic factor (Figure 2.1, Model 3). Another scoring protocol, previously supported in sport (Hodge & Lonsdale, 2011) and dance settings (Balaguer et al., 2011), is based on the autonomous versus controlled motivation distinction (Deci & Ryan, 2008), and has higher order autonomous and controlled factors (Figure 2.1, Model 4). The final modelling option (Figure 2.1, Model 2),

previously tested by Lonsdale et al. (2008), draws from both the intrinsic, extrinsic, amotivation distinction, and the differentiation between more autonomous (integrated & identified) and more controlled extrinsic (external & introjected) regulations.
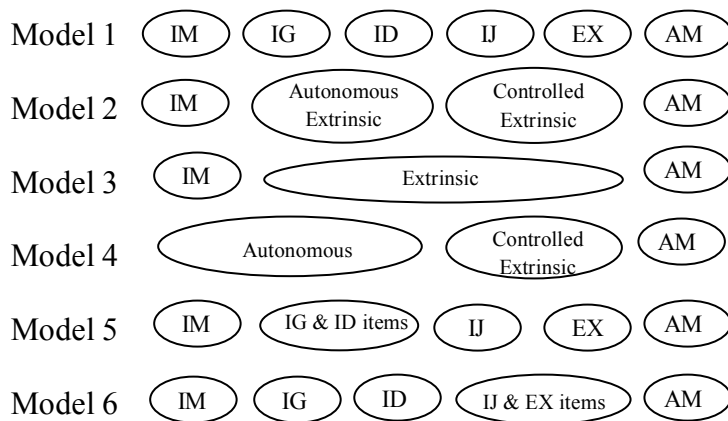


*Figure 2.1.* CFA models tested in this study. Models 1, 5, and 6 are first order factor models. Models 2-4 are second order factor models. Factor items are included in all tested models, as detailed by Lonsdale et al. (2008), but are not shown here for simplicity. IM = Intrinsic, IG = Integrated, ID = Identified, IJ = Introjected, EX = External, AM = Amotivation. Autonomous Extrinsic = second order factor of IG and ID. Controlled Extrinsic = second order factor of IJ and EX. Extrinsic = second order factor of IG, ID, IJ and EX. Autonomous = second order factor of IM, IG, and ID.

Few investigations (e.g., Lonsdale et al., 2008; Mullan et al., 1997; Wilson et al., 2012) examining measures of motivation from an SDT perspective have tested multiple scoring protocols applied to the same data. Only one (Lonsdale et al., 2008) has used the BRSQ. Lonsdale et al. (2008) found the six-factor model to fit the data (CFI = .99) better than any alternative models tested. However, a number of other models; including models 2 and 4 (Figure 2.1), also demonstrated adequate fit to the data (CFI > .95) in the work by Lonsdale and colleagues (2008). Drawing from the tenets of SDT (Deci & Ryan, 1985), and suggested scoring protocols from previous studies (Lonsdale et al., 2008), another key aim of this study is to examine the tenability of using different scoring protocols when employing the BRSQ with dancers. The findings will be used to form recommendations for scoring the BRSQ in future work.

## Method

**Participants and procedure**

Participants were 1212 dancers[2] (240 male, 954 female, 5 gender unspecified) participating at recreational ($N = 344$) or vocational ($N = 868$) levels. Recreational dancers were recruited from private dance schools in the UK that deliver evening and weekend classes in a range of styles. Vocational dancers were recruited from full-time dance schools in the UK. Dancers age ranged from 10-79 years ($M = 20.19$, $SD = 10.41$) and reported having danced for an average of 11.65 years (*range* = 6 months - 60 years). Adolescent dancers ($N = 572$) were aged 10-17 years of age ($M = 15.33$, $SD = 1.79$) and adult dancers ($N = 636$) were aged 18-79 years of age ($M = 24.56$, $SD = 12.73$). Five dancers did not specify their age. Prior to commencement of the data collection, the study was approved by a university ethics board.

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[2] BRSQ data for non-elite dancers were collated from Norfield & Nordin-Bates (2012) and Hancox, Quested, & Duda (under review).

Participation was voluntary and it was made clear that all answers would remain confidential. Informed written consent was gained from all dancers and parental consent was also obtained for dancers under 16 years of age.

**Measure**

Participants completed the 24-item Behavioral Regulations in Sport Questionnaire (BRSQ; Lonsdale et al., 2008), with minor adaptation of the wording to make the items applicable to dancers. The stem used was "I participate in dance…". The BRSQ has 6 subscales each with 4 items; intrinsic motivation (e.g., "because I enjoy it"), integrated regulation (e.g., "because it's part of who I am"), identified regulation (e.g., "because I value the benefits of dancing"), introjected regulation (e.g., "because I would feel guilty if I quit"), external regulation (e.g., "because people push me to dance"), and amotivation (e.g., "but I question why I continue"). The Likert scale ranged from 1 (*not at all true*) to 7 (*very true*).

**Data Analysis**

Analyses were conducted using SPSS and Mplus 7 (Muthén & Muthén, 2012). Data were screened for errors, missing values and normality. The item distributions had large floor and ceiling effects with skewness values ranging from -2.30 to 2.55 and kurtosis values from -7.07 to 8.98 (Table 2.1). Due to the non-normality of item distributions the responses were modelled and treated as ordered categorical data (Brown, 2006; Byrne, 2012). Missing value analysis revealed missing data to account for less than 5%. As the data was analysed as categorical and there was a low level of missing data the weighted least squares mean and variance corrected (WLMSV) estimator was employed and pairwise deletion used to replace missing data. WLMSV utilises polychoric correlations and has been shown to be relatively robust with non-normal categorical data (Brown, 2006; Flora & Curran, 2004).

Before performing the main analysis, the six-factor structure BRSQ model was examined for invariance across dance level (recreational & vocational) and age ($< 18$ & $\geq 18$ years of age). Age groupings were selected based on the findings of Holland et al. (2010) with dancers aged 14-17 years. When responding to the intrinsic motivation subscale items, dancers did not use the entire range of scores (1-7). Recreational dancers only utilised the top four categories (4-7) and vocational dancers only responded in the top five categories (3-7). In order to conduct meaningful multi-group comparisons, both groups need to share the same response categories. Consequently, response to categories 1-4 were collapsed into a single category labelled as "*somewhat true*".

Firstly, the model was tested separately for recreational and vocational dancers (Jöreskog, 1971). Secondly, invariance testing was conducted using a procedure of three nested models (configural, metric, & scalar; Jöreskog, 1971), adapted by Millsap and Yun-Tein (2004) for use with categorical data. Configural invariance tests whether the same basic factor structure (i.e., items loading onto their intended factors) holds for both groups. Metric invariance tests a more restrictive model as factor loadings are constrained to be equal across groups but thresholds are free. Finally scalar invariance is the most restrictive model as both factor loadings and thresholds are constrained to be equal across groups. The indicators used to compare the nested models were the chi-square difference as computed in Mplus for categorical variables, and differences in Comparative Fit Index (CFI), Tucker and Lewis Index (TLI), and Root Mean Squared Error of Approximation (RMSEA) (Marsh, Nagengast, & Morin, 2012). Based on Marsh et al.'s (2012) guidelines, the more parsimonious model should be selected only if changes in CFI ($\Delta$CFI) are less than .01 (Cheung & Rensvold, 2002), and TLI and RMSEA are equal to or better than that of the more complex model.

CFA was conducted to test the construct validity of the six-factor BRSQ model and 5 alternative nested models (Figure 2.1), all of which were derived from the principles of SDT (Deci & Ryan, 1985, 2000) and have been used previously in at least one published paper. Goodness of fit was assessed with the common fit indices (Jackson, Gillaspy, & Purc-Stephenson, 2009): $\chi^2$, CFI, TLI, and RMSEA. The standardized root mean squared residual (SRMR) is unavailable when using the WLSMV estimator. For categorical data there are few studies with recommendations for the cut off values, however, simulation studies by Yu (2002) concluded that a CFI > .96 would be safer. For quantitative data CFI and TLI values > .90 and RMSEA values < .08 advocate an acceptable fit (Marsh, Hau, & Wen, 2004) and CFI and TLI values > .95 and RMSEA < .06 are considered as indicators of excellent fit (Hu & Bentler, 1999) and they have been utilised with categorical data with some caution (e.g., Myers, Chase, Pierce, & Martin, 2011).

## Results

### Descriptive Statistics

Descriptive statistics by item for all dancers are displayed in Table 2.1. Item means indicate that dancers' motivation regulations were generally highly self-determined with mean scores on all autonomous subscales (intrinsic, integrated and identified) above the midpoint. Dancers reported low levels of controlled motivations (introjected and external) and amotivation with these three subscales falling below the mid-point. Inter-factor correlations (Table 2.2) conform to a simplex-like structure (Ryan & Connell, 1989), as factors theoretically closer together on the self-determination theory continuum were more highly positively correlated and those further away have negative correlations.

Table 2.1

*Percentage Floor and Ceiling Effects, Mean (M), Standard Deviations (SD), Skewness (S), Kurtosis (K), Factor Loadings (λ) and Standard*

*Errors (S.E.) by Item*

| Item | % floor | % ceiling | M | SD | S | K | λ | S.E. |
|---|---|---|---|---|---|---|---|---|
| IN1 because I enjoy it | 0.00 | 76.32 | 6.68 | 0.66 | -2.30 | 5.43 | .86 | .02 |
| IN2 because I like it | 0.17 | 74.98 | 6.62 | 0.78 | -2.67 | 8.98 | .90 | .02 |
| IN3 because it´s fun | 0.17 | 54.30 | 6.20 | 1.09 | -1.47 | 2.05 | .76 | .02 |
| IN4 because I find it pleasurable | 0.91 | 44.47 | 6.03 | 1.16 | -1.50 | 2.74 | .72 | .02 |
| IG1 because it's a part of who I am | 0.74 | 46.61 | 6.01 | 1.22 | -1.34 | 1.71 | .80 | .02 |
| IG2 because it's an opportunity to just be who I am | 2.15 | 31.74 | 5.51 | 1.43 | -0.96 | 0.68 | .78 | .02 |
| IG3 because dancing is an expression of who I am | 1.65 | 33.03 | 5.65 | 1.36 | -1.10 | 1.05 | .81 | .02 |
| IG4 because it allow me to live in a way that is true to my values | 9.45 | 19.82 | 4.65 | 1.85 | -0.48 | -0.71 | .63 | .02 |
| ID1 because the benefits of dance are important to me | 1.24 | 32.67 | 5.66 | 1.32 | -1.01 | 0.86 | .77 | .02 |
| ID2 because it teaches me self-discipline | 4.98 | 25.73 | 5.11 | 1.67 | -0.77 | -0.06 | .53 | .02 |
| ID3 because I value the benefits of dance | 1.00 | 39.17 | 5.87 | 1.25 | -1.26 | 1.72 | .85 | .02 |
| ID4 because it is a good way to learn things which could be useful to me in my life | 4.99 | 21.21 | 4.86 | 1.72 | -0.53 | -0.55 | .60 | .02 |
| IJ1 because I would feel ashamed if I quit | 40.59 | 6.27 | 2.76 | 1.95 | 0.81 | -0.61 | .80 | .01 |

| Item | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| IJ2 because I would feel like a failure if I quit | 45.08 | 5.38 | 2.61 | 1.91 | 0.92 | -0.41 | .84 | .01 |
| IJ3 because I feel obligated to continue | 45.93 | 3.57 | 2.44 | 1.75 | 1.05 | 0.02 | .80 | .02 |
| IJ4 because I would feel guilty if I quit | 45.12 | 5.12 | 2.50 | 1.82 | 1.06 | 0.00 | .81 | .01 |
| EX1 because if I don't other people will not be pleased with me | 57.27 | 1.74 | 1.98 | 1.47 | 1.59 | 1.80 | .85 | .01 |
| EX2 because I feel pressure from other people to dance | 68.21 | 0.99 | 1.67 | 1.25 | 2.19 | 4.48 | .92 | .01 |
| EX3 because people push me to dance | 75.00 | 0.74 | 1.54 | 1.17 | 2.55 | 6.22 | .81 | .02 |
| EX4 in order to satisfy people who want me to dance | 58.33 | 1.73 | 1.99 | 1.52 | 1.61 | 1.69 | .77 | .02 |
| AM1 but the reasons why are not clear to me anymore | 57.73 | 1.90 | 1.98 | 1.49 | 1.62 | 1.87 | .83 | .02 |
| AM2 but I wonder what the point is | 62.90 | 1.66 | 1.87 | 1.42 | 1.72 | 2.29 | .85 | .01 |
| AM3 but I question why I continue | 57.26 | 1.99 | 2.03 | 1.54 | 1.51 | 1.41 | .90 | .01 |
| AM4 but I question why I am putting myself through this | 45.22 | 3.24 | 2.46 | 1.76 | 1.03 | -0.07 | .78 | .02 |

*Note.* IN = Intrinsic, IG = Integrated, ID = Identified, IJ = Introjected, EX = External, AM = Amotivation

Table 2.2

*Factor Correlation Matrix (CFA – WLSMV)*

| Subscale | IM | IG | ID | IJ | EX |
|---|---|---|---|---|---|
| Intrinsic Motivation (IM) | | | | | |
| Integrated Regulation (IG) | .62** | | | | |
| Identified Regulation (ID) | .56** | .63** | | | |
| Introjected Regulation (IJ) | -.48** | -.15* | -.05 | | |
| External Regulation (EX) | -.51** | -.22** | -.09 | .81** | |
| Amotivation (AM) | -.69** | -.35** | -.29** | .73** | .72** |

*Note.* * = *p* < .01, ** = *p* < .001

**Invariance Analysis**

The results for multi-group CFA for dance level and age are displayed in Table 2.3. The model demonstrates acceptable fit to the data for recreational dancers ($X^2$ (237) = 754.94, $p < .001$; CFI = .94, TLI = .93, RMSEA = .08) and excellent fit for vocational dancers ($X^2$ (237) = 1027.24, $p < .001$; CFI = .96, TLI = .95, RMSEA = .06). Full scalar measurement invariance for dance level was achieved, with the most constrained model demonstrating acceptable fit to the data. Factorial invariance for dance level was supported by the change in CFI being < .01 between each increasingly constrained model. The BRSQ was also invariant across age reaching full scalar invariance with dancers grouped by age (< 18 & $\geq$ 18 years of age). Therefore, subsequent analyses were conducted with all dancers considered as one group.

**Confirmatory Factor Analysis**

The six-factor BRSQ model (Figure 2.1 & Table 2.4, Model 1) demonstrated good fit to the data ($X^2$ (237) = 1517.90, $p < .001$; CFI = .95, TLI = .94, RMSEA = .07, RMSEA 90% CI = .06-.07). No problems were observed with individual parameters. All factor loadings were statistically significant (range = .53 - .92) with low standard error values (see Table 2.1). Intra-factor correlations (Table 2.2) reveal a relatively high correlation between introjected and external regulations (.81) suggesting possible problems with discriminant validity. This is further supported by introjected and external regulations having similar correlations with amotivation (.73 and .72, respectively).

**Alternative Models**

Initially 3 alternative nested models were tested (Figure 2.1 & Table 2.4, Models 2-4). Analyses revealed none of the models to meet the criteria for excellent fit for categorical data (CFI > .96) as suggested by Yu (2002). Model 2 demonstrated good fit to the data (CFI = .95).

The ΔCFI value between the 6-factor model (Model 1) and Model 2 was less than the recommended cut off of .01 (Cheung & Rensvold, 2002), suggesting that the models are similar in fit. Model 3 had unacceptable fit to the data (CFI < .90). Furthermore, the ΔCFI value between Model 3 and Model 1 is > .01 indicating a statistical preference for the six-factor structure over a model with a higher order extrinsic factor. Model 4 revealed adequate fit to the data (CFI = .93). However, the ΔCFI value between Model 4 and Model 1 is > .01 indicating that in terms of factorial validity the six-factor structure is a preferable representation of the data.

To further explore issues of discriminant validity between integrated and identified regulations and between introjected and external items, 2 further alternative models (Figure 2.1 & Table 2.4, Models 5 & 6) were tested. The idea is to rule out the possibility that some items may not have a second order structure and load directly onto a higher first order factor instead (e.g., integrated and identified items both loading directly onto the autonomous extrinsic higher first order factor). In Model 5, integrated and identified items loaded freely onto the same higher order factor with acceptable fit (CFI = .94; factor loadings range = .45-.76). However, as the ΔCFI is greater than .01, the six-factor model is considered preferable over Model 5. In Model 6, introjected and external items loaded freely into one combined first higher order factor. The results demonstrated acceptable model fit (CFI = .94) with all items having high factor loadings (range = .74-.89) and a ΔCFI value below .01, suggesting only slight differences in fit between the 6-factor structure and Model 6.

Table 2.3

*Invariance Analysis of Dance Level and Age: Multi-group CFA Results*

|  | $X^2$(df) | *p* | Par | CFI | TLI | RMSEA | $\Delta X^2$(df) | *p* | $\Delta$CFI |
|---|---|---|---|---|---|---|---|---|---|
| **Dance Level** |  |  |  |  |  |  |  |  |  |
| Configural | 1739.81(474) | <.001 | 342 | .95 | .94 | .07 |  |  |  |
| Metric | 1662.94(492) | <.001 | 324 | .96 | .95 | .06 | 46.22(18) | <.001 | .00 |
| Scalar | 1961.61(594) | <.001 | 222 | .95 | .95 | .06 | 432.79(102) | <.001 | -.01 |
| **Age** |  |  |  |  |  |  |  |  |  |
| Configural | 1813.71(474) | <.001 | 342 | .95 | .94 | .07 |  |  |  |
| Metric | 1717.96(492) | <.001 | 324 | .95 | .95 | .06 | 39.50(18) | <.001 | .00 |
| Scalar | 1969.86(594) | <.001 | 222 | .95 | .95 | .06 | 255.91(102) | <.001 | -.01 |

*Note.* $\Delta X^2$ = chi-square difference, $\Delta$CFI = change in CFI, when comparing the fit of the more constrained model with the previous less constrained model (Cheung & Rensvold, 2002).

Table 2.4

*Confirmatory Analysis Results for all BRSQ Models Tested*

| Model | $X^2$(df) | $p$ | Par | CFI | TLI | RMSEA | $\Delta X^2$(df) | $p$ | $\Delta$CFI |
|---|---|---|---|---|---|---|---|---|---|
| 1. | 1517.90(237) | <.001 | 181 | .95 | .94 | .07 | | | |
| 2. | 1460.97(242) | <.001 | 176 | .95 | .95 | .06 | 29.69(5) | <.001 | .00 |
| 3. | 4514.57(245) | <.001 | 173 | .84 | .81 | .12 | 896.57(8) | <.001 | -.12 |
| 4. | 2187.10(244) | <.001 | 174 | .93 | .92 | .08 | 286.38(2) | <.001 | -.03 |
| 5. | 1890.03(242) | <.001 | 176 | .94 | .93 | .08 | 169.14(5) | <.001 | -.02 |
| 6. | 1718.18(242) | <.001 | 176 | .94 | .94 | .07 | 124.73(5) | <.001 | -.01 |

*Note.* Model numbers related to those in Figure 2.1. Models 2-6 are all nested in Model 1. In model 4 intrinsic motivation and the higher order autonomous factor were highly correlated, near the boundary of 1.

**Discussion**

The first aim of this study was to examine the validity of the BRSQ for measuring motivation in dance contexts. This study provides initial evidence regarding the factorial and discriminant validity of the BRSQ scores in recreational and vocational dancers. Similarly to previous research with athletes (e.g., Holland et al., 2010; Lonsdale et al., 2008, 2009; Viladrich et al., 2011) the validity evidence of the internal structure of the BRSQ (when tested with all dancers and not controlling for age) was generally supported as the six-factor model demonstrated good fit to the data. However, aligned with the conclusions of Lonsdale et al. (2008), issues of discriminant validity appear to be a characteristic of the BRSQ, particularly between introjected and external regulations. The second aim of the study was to determine the tenability of using different scoring protocols to model the motivation regulations. This study provides psychometric evidence for some scoring protocols utilised with the BRSQ, however, not all protocols were psychometrically supported. Findings have important implications for the use and scoring of the BRSQ in future studies in sport and dance contexts.

**Invariance of the BRSQ across Age and Dance Level**

In support of the first hypothesis, the BRSQ was found to be invariant across dance level with the measure demonstrating acceptable factorial validity with both recreational and vocational dance populations. This finding is in line Lonsdale et al. (2008) who reported the BRSQ to be valid with both elite and non-elite athletes and provides further support for the use of the measure with performers at differing levels of ability.

In contrast to the second hypothesis, results revealed the BRSQ to be invariant across age, with the factorial validity of the measure supported among adolescent and adult dancers. These findings are similar to those of Viladrich and colleagues (2011) who report the Spanish

adaption of the BRSQ to be valid when employed with athletes as young as 12 years of age. Hence, this study adds to the current evidence (Lonsdale et al., 2008; Viladrich et al., 2011) supporting the factorial validity of the BRSQ with young adolescents and suggests that the factor structure of the BRSQ may hold for dancers as young as 10 years of age. However, the quantitative methodologies conducted in this study do not allow difficulties experienced by young study participants when completing the BRSQ, in terms of the understanding and interpretation of items, to be captured. Hence, future research adopting a cognitive interview approach (Holland et al., 2010) may provide a more in depth insight into the usability of the measure with dancers of all ages.

**Issues of Discriminant Validity with the BRSQ**

The third aim of the study was to examine whether issues of discriminant validity are evident when the BRSQ is employed in dance contexts. The intra-factor correlations conformed to a simplex-like pattern (Ryan & Connell, 1989) in the present research. However, similarly to findings reported by Lonsdale and colleagues (2008), both introjected and external regulations had similar (positive) correlations with amotivation. Further exploration revealed a relatively high intra-factor correlation between introjected and external subscales. Moreover, a model in which the introjected and external items loaded directly onto a controlled extrinsic higher first order factor was found to have high factor loadings and similar fit to that of the six-factor BRSQ model. These findings suggest that the BRSQ may be unable to discriminate between individuals' introjected and external regulations. A possible explanation for the issue of discriminant validity is that the introjected and external items in the BRSQ may be ambiguous. For example, a dancer may feel obligated to continue because they would feel ashamed if they quit, or they may feel obligated to continue because of pressure from significant others. If the latter, then dancers' introjected regulations may be

strongly tied with their external regulations for engagement. Rewording of some items considered problematic may remove this ambiguity.

**The Tenability of Different Scoring Protocols**

The final hypothesis that modelling the motivational regulations independently would have the most acceptable factorial validity of all tested scoring protocols was partially supported. Modelling the motivational regulations using the six-factor structure revealed good fit to the data but there was a high correlation between external and introjected regulations. Furthermore, modelling the motivation regulations with higher autonomous extrinsic and controlled extrinsic factors (Figure 2.1, Model 2) showed similar fit to that of the 6-factor model. The findings suggest that the BRSQ is not completely accurate in terms of capturing the intended constructs and their inter-relations as defined by SDT.

In terms of the practical application of these results, it is important to consider both statistical preferences for model fit and the theoretical implications how the motivational regulations are modelled. Although Model 2 was statistically similar in fit to the 6-factor structure, reducing the number of constructs used to represent the degree of self-determination underpinning individuals' engagement results in loss of information central to the theory. Going forward, in order to enhance understanding of participants' experiences in sport, physical activity, and dance settings, future research examining the antecedents and outcomes of motivation regulations for engagement needs to focus on precision. Currently there is a large body of research evidence supporting the benefits of individuals reporting 'in general' to experience more autonomous motivation. However, there is a paucity of studies examining key questions such as specifically which self-regulatory styles best predict certain affective, cognitive, and/or behavioural outcomes, or how and why individuals' quality of motivation may change over time or within-individuals. Modelling the motivational regulations

independently allows examination of these important questions which will enable the development of a greater knowledge base. This knowledge base can then be used to aid the development of effective interventions which promote dancers' optimal motivation and psychological well-being.

If researchers need to utilise alternative scoring protocols in order to achieve the aims of their investigation, then based on the findings of this study it is recommended that model 2 (intrinsic, autonomous extrinsic, controlled extrinsic, and amotivation) or model 4 (autonomous, controlled extrinsic, and amotivation) are adequate options. Both of these approaches demonstrated adequate fit to the data and are theoretically aligned with current SDT literature which favours the autonomous verses controlled motivation distinction, over the intrinsic-extrinsic approach (Deci & Ryan, 2008). Based on the findings of this study it is recommended that researchers cease to model the motivation regulations using a higher order extrinsic factor as presented in model 3 (i.e., intrinsic, extrinsic, amotivation). The fit of this model was found to be unacceptable and the model does not reflect the more contemporary SDT approach that distinguishes between autonomous and controlled motivation regulations (Deci & Ryan, 2008).

**Conclusion**

In conclusion, this study provides initial evidence for the internal structure of the BRSQ with dancers. Due to the non-normality of item distributions (i.e., large floor and ceiling effects) responses were modelled and treated as ordered categorical data (Brown, 2006; Byrne, 2012). This approach has also been adopted in a previous study (Viladrich et al., 2013) which examined invariance of the BRSQ when completed by young athletes across five European countries. Analysing categorical data as continuous when large floor and ceiling effects are present (especially when data are skewed in opposite directions) can result in

inflated $X^2$, underestimated factor loadings, low standard error estimates, and attenuated Person's correlation co-efficients and parameter estimates (Brown, 2006; Byrne, 2012). Thus, it is recommended that future research adopt a similar approach to data analysis when this assumption of normality is violated.

The results suggest that the BRSQ is a valid measure with both recreational and vocational dancers. However, a note of caution is warranted in terms of the ability of the measure to effectively discriminate between all six self-regulatory styles. Further examination into the issues of discriminant validity between subscales is needed. Measurement development is an on-going process. The BRSQ was chosen as the measure of interest in this study based due to the SMS-II not being available at the time. However, going forward future research making direct comparisons between the performance of the BRSQ and the SMS-II when administered to the same sample is needed in order to determine which measure is 'superior' in terms of reliability and validity. Continued evaluation of measures of motivation is needed in order for the development of a 'gold standard' questionnaire which can be used to reliably and validly to assess individual differences in motivation in different settings.

**Teacher Interpersonal Style, and Dancers' Basic Psychological Needs,**

**Motivations and Affective States in Recreational Dance**

**Abstract**

Objectives: Grounded in self-determination theory (SDT; Deci & Ryan, 1985, 2000), the present study tested two hypothesised models; Model A and B. In Model A teachers' interpersonal style was hypothesised to predict dancers' basic need satisfaction and/or thwarting, and in turn, to both directly and indirectly (via the motivational regulations) predict dancers' reported positive affect and negative affect. Based on the proposition by Gunnell et al. (2014), Model B examined whether dancers' motivation regulations may be antecedents to the basic psychological needs. The theoretically-assumed mediating roles of the basic needs and motivation regulations were also considered.

Method: Two-hundred and sixty (11 male, 249 female) recreational dancers (*M*age = 20.75, *SD* = 12.34) completed a cross-sectional questionnaire measuring the variables of interest.

Results: Path analysis revealed Model A to demonstrate excellent fit (CFI = .96) and explain 39% of variance in dancers' positive affect and 43% of variance in dancers' negative affect. Model B had acceptable fit (CFI = .92), however, explained less variance in dancers' affective states. The basic psychological needs mediated the relationships between teacher interpersonal style and affective states. Identified regulation and amotivation significantly mediated the relationship between dancers' basic need satisfaction and positive affect.

Discussion: Findings provide initial support for the tenets of SDT in recreational dance settings. The results suggest that theoretically, basic need thwarting may operate differently to need satisfaction, playing a more direct role in the prediction of negative affect. This study has important implications for the delivery of sport, exercise, and dance programmes and provides evidence that can be drawn upon in the future to promote continued healthful participation in these contexts.

*Keywords:* Dance; Autonomy support; Control; Basic needs; Motivation

**Introduction**

Dance has become an increasingly popular and easily accessible form of recreation (Arts Council England, 2009) and engages a wide spectrum of people including those who do not typically find sport or exercise appealing (Youth Dance England, 2010). Regular physical activity, such as that which can be accrued via dance, is considered vital for the enhancement of physical and psychological well-being (Biddle & Mutrie, 2008). However, it has been recognised that individuals' experiences of dance participation is not always optimal and that variability in experiences may be dependent upon social environmental factors and motivational processes (e.g., Quested & Duda, 2011a).

Self-determination theory (SDT; Deci & Ryan, 1985, 2000) is a popular motivational framework used to examine the social-environmental conditions which promote optimal growth and development in a variety of contexts. This study will focus on examining the integration of two mini-theories of SDT; Basic psychological needs theory (BPNT) and Organismic integration theory (OIT). In line with SDT (Deci & Ryan, 1985, 1991) and Vallerand's (1997) hierarchical model of intrinsic and extrinsic motivation, previous research (e.g., Edmunds, Ntoumanis, & Duda, 2006; Ng et al., 2012; Vallerand & Losier, 1999) has tended to integrate BPNT and OIT by testing a model in which variation in key social-environmental factors influence individuals' basic psychological needs, which in turn, determine quality of motivation, and ensuing cognitive, emotional, and behavioural outcomes.

In support of BPNT, previous research with vocational dancers (e.g., Quested & Duda, 2010, 2011b; Quested et al., 2013) have found dancers' experiences of basic need satisfaction to mediate the relationship between perceptions certain social-environment dimensions (i.e., autonomy support, social support, and task- and ego-involving features) and psychological outcomes (e.g., affective states). Past research with dancers (e.g., Balaguer et al., 2011;

Norfield & Nordin-Bates, 2012; Quested & Duda, 2011a) has also supported OIT finding perceptions of the teacher-created social-environment (i.e., autonomy support, social support, and task- and ego-involving features) to influence individuals' quality of motivation and psychological well-being. However, to date research with dancers has not tested both BPNT and OIT within the same model. Furthermore, previous research in dance has predominantly targeted vocational settings and neglected to examine key components of SDT (i.e., controlling teacher behaviours, basic psychological need thwarting, and the mediating role of the motivation regulations).

Drawing from SDT, the purpose of this study was to explore the psychosocial mechanisms linking social-environmental factors (such as the teachers' interpersonal style) to recreational dancers' affective states. This study builds on previous research in dance contexts by being the first to consider the 'darker side of dance' and examine the predictive utility of dancers' perceptions of controlling teacher behaviours and basic psychological need thwarting. This is important as it has been proposed (Quested, 2010) that more maladaptive features of the social environment (such as teachers' controlling behaviours) and basic need thwarting may explain more variance in indicators of dancers' ill-being. Furthermore, this study is the first to explore the mediating role of the motivational regulations (when modelled independently, as recommended in study 1) between basic psychological need satisfaction and thwarting and individuals' affective states, not just in the context of dance literature but in any context. Examination of the predictive utility and distinct role attributable to each of the motivation regulations enhances understanding of the possible causal mechanisms for variability in individuals' quality of motivation and emotional experiences. Such knowledge can be used to promote positive participation and circumvent compromised, unhealthy engagement in dance via the application of adaptive motivational principles.

**The Role of the Social-Environment and Basic Psychological Needs**

The degree to which significant others (e.g., teachers) are autonomy supportive and/or controlling is understood to be important to the facilitation of autonomous regulation and psychological well-being. An autonomy supportive style actively engages individuals and nurtures volitional intentions. A teacher who adopts an autonomy supportive interpersonal style tends to acknowledge students' perspectives, provide rationale, promotes choice and solicits input (Mageau & Vallerand, 2003). In contrast, a controlling interpersonal style is exhibited when teachers are authoritarian, coercive, and pressure students to behave and think in certain ways (Bartholomew et al., 2010). Previous research in vocational dance settings (Quested & Duda, 2010, 2011a, 2011b, 2011c) has supported the role of dancers' perceptions of teacher autonomy support in predicting dancers' quality of engagement and indices of psychological well- and ill-being. However, to date no research has considered dancers' perceptions of teacher control; which is surprising considering the typical stereotype of dance teachers as demanding, autocratic figures (Van Rossum, 2004).

BPNT (Deci & Ryan, 2000) posits that the relationship between dimensions of the social environment and indicators of optimal functioning and well- or ill-being is mediated by the satisfaction or thwarting of three basic psychological needs; autonomy, competence, and relatedness. The basic psychological need for autonomy refers to individuals feeling a sense of control in and choice over their behaviours, which are perceived as self-initiated and reflective of personal values (DeCharms, 1968). The basic psychological need of competence is satisfied when an individual feels they can successfully achieve their goals and function effectively in their environment (White, 1959). Finally, the basic psychological need for relatedness refers to the degree to which an individual feels meaningfully connected, understood, and cared for by others (Baumeister & Leary, 1995).

Basic psychological need thwarting occurs when individuals' feel that their needs are being obstructed or actively undermined within a given context (Bartholomew et al., 2011a). For example, a dancer might feel her need for competence is thwarted because the teacher criticises her ability in a demeaning manner. Previous research with athletes (Bartholomew et al., 2011a; Bartholomew et al., 2011b) has found a moderate negative correlation between need satisfaction and need thwarting supporting the notion that they are not polar ends of the same continuum but distinct constructs which predict unique variance in targeted outcomes.

BPNT-framed studies in sport contexts have supported a model in which athletes perceptions of their coaches' autonomy supportive behaviours primarily predicted basic need satisfaction and, in turn, indices of well-being (i.e., positive affect, vitality) (Balaguer et al., 2012; Bartholomew et al., 2011a, 2011b). In contrast, perceptions of coach control predicted athletes' need thwarting and, in turn, indicators of compromised health (i.e., disordered eating, burnout, depression, negative affect). Collectively, Balaguer and colleagues' (2012) and Bartholomew et al.'s (2011a, 2011b) studies suggest that measures of both coach control and basic psychological need thwarting should also be included in research examining predictors of ill-being, as they better account for variation in maladaptive outcomes. This point is particularly relevant in dance research given that previous studies (Quested & Duda, 2010, 2011a, 2011b) have recognised that engagement is not always positive and can result in negative psychological outcomes, such as, negative affect, low levels of self-esteem, and burnout. However, past work with dancers (e.g., Quested & Duda, 2010, 2011a, 2011b) has not measured basic need thwarting which could have accounted for further variance in the targeted indicators of diminished functioning.

**Motivational Regulations and Affective States**

Individuals' motivation regulations (i.e., the range of motives underlying behaviour), are considered to be organised on a continuum of self-determination (Ryan & Deci, 2000a). For details of each of the motivation regulations please refer to Chapter 1 (p.7). Research in sport, physical education, and dance contexts has generally supported the SDT premise that more autonomous forms of motivation are associated with positive outcomes such as higher perceived levels of effort and persistence (Standage, Duda, & Ntoumanis, 2006), subjective vitality (Gagne, Ryan, & Bargmann, 2003), and positive affect (Quested & Duda, 2011a). Whereas, more controlled forms of motivation (i.e., introjected, external regulations) or amotivation are associated with more maladaptive outcomes such as, dropout (Pelletier et al., 2001), higher levels of negative affect (Ntoumanis, 2005), and burnout (Balaguer et al., 2011).

Testing mediation models of psychological processes allows researchers to develop a greater understanding of how they work and identify possible causal mechanisms (Shrout & Bolger, 2002). Research in sport, exercise, and physical education settings (e.g., Blanchard, Amiot, Perreault, Vallerand, & Provencher, 2009; Edmunds, Ntoumanis, & Duda, 2006; Ntoumanis, 2005) has supported the mediating role of motivational regulations between basic need satisfaction and indices of psychological well- and ill-being. To date, no research has examined the assumed mediating role of motivational regulations in dance contexts. Furthermore, no studies to our knowledge have investigated the mediating role of the motivational regulations between basic need thwarting and psychological outcomes in any context. Considering a key tenet of SDT is that basic psychological need satisfaction and/or thwarting are relevant in determining the degree of self-determination underpinning behavioural engagement, which in turn, predicts positive and negative outcomes, it is pertinent that this part of the theory not be overlooked in the literature. Hence, this study builds on previous research by extending the SDT model tested by Bartholomew et al. (2011a,

2011b) and Balaguer and colleagues (2012) to include motivational regulations as mediating variables between basic need satisfaction and thwarting, and positive and negative affective states.

It is important to note that the way the motivational regulations have been modelled has varied in the literature. In analyses a number of researchers (e.g., Standage et al., 2006), have used a self-determination index which involves creating a composite value by summing weighted scores according to their location on the self-determination continuum. Other studies have reduced the motivation regulations into composite scores, such as, autonomous and controlled motivation (e.g., Hodge & Lonsdale, 2011) or intrinsic, extrinsic, and amotivation (e.g., Quested & Duda, 2011a). Reducing the number of constructs used to represent the degree of self-determination underpinning individuals' engagement, results in loss of information central to the theory. However, modelling the motivational regulations independently (e.g., Ntoumanis, 2001; Pelletier et al., 2001) allows researchers to identify which self-regulatory styles best predict certain affective, cognitive, and/or behavioural outcomes. Furthermore, the findings of Study 1 (Chapter 2) support the six-factor structure of the BRSQ with recreational dancers. Hence, the motivational regulations were modelled independently in this study. Affective states were selected as outcome variables because they are considered an essential component of subjective well-being (Diener, 2000) and allow for comparison and progression on from previous literature in dance (e.g., Quested & Duda, 2009a, 2010) and sport (e.g., Bartholomew et al., 2011a) contexts which have assessed dancers'/athletes' affective states.

A recent study by Gunnell et al. (2014) argues that it is important to examine where the motivation regulations sit in the SDT sequence by testing alternative models, rather than just assuming their role. Testing alternative models is an important step theory development

(Kline, 2010) that helps to avoid confirmation bias (MacCallum & Austin, 2000). Modelling the basic needs as antecedents of motivation implies that the psychological needs have an indirect relationship with well-being outcomes. This hypothesis is consistent with the internalisation component of OIT (Ryan & Deci, 2000a), but not in line with BPNT which asserts that variation in need fulfilment directly predicts variations in well-being outcomes (Deci & Ryan, 2000). Building on this line of thought Gunnell and colleagues (2014) proposed and found support for a model in which motivation predicts satisfaction of the three basic psychological needs.

Gunnell et al. (2014) report need satisfaction to mediate the relationships between changes in autonomous motivation and increases in vitality, positive affect and decreases in negative affect, over a 6 month period. Changes in controlled motivation directly and positively predicted changes in individuals' negative affect; however, in contrast to their hypothesis, Gunnell et al. (2014) found that changes in need satisfaction did not mediate the relationship between controlled motivation and negative affect. Drawing from Bartholomew et al.'s (2011a, 2011b) theorising on basic need satisfaction and thwarting being distinct (yet inter-related) constructs which produce differential outcomes, Gunnell and colleagues (2014) suggest that basic need thwarting may better explain the relationship between individuals' controlled motivations and negative affect. The present study builds on the work of Gunnell et al. (2014) by examining the relationships between dancers' motivation regulations and both experiences of need satisfaction and need thwarting.

Theoretically both a model in which basic psychological needs are antecedents to motivation and a model in which motivation precedes the psychological needs could be considered plausible (Deci & Ryan, 2000; Vallerand, 1997). Thus, it is important to test which model provides the best account of the data. Therefore, in addition to examining

whether basic need satisfaction/thwarting predict dancers' motivation regulations and, in turn, affective states, the current investigation will also test an alternative model wherein motivation precedes psychological need satisfaction/thwarting.

**Aims and Hypotheses**

The main aim of the present study was to test a hypothesized SDT-based model (Figure 3.1, Model A) in which recreational dancers' perceptions of their teachers' interpersonal style (autonomy supportive and controlling behaviours) predict dancers' basic need satisfaction and/or thwarting, which in turn, both directly and indirectly (via the motivational regulations) predict dancers' reported positive affect and negative affect.

Within model A the mediating role both basic psychological need satisfaction and need thwarting between dancers' perceptions of teacher autonomy support and control and dancers' affective states was examined. Based on BPNT (Deci & Ryan, 2000) it was hypothesised that basic need satisfaction would mediate the relationship between dancers' perceptions of teacher autonomy support and reported positive affect. In addition, basic need thwarting was expected to mediate the relationship between dancers' perceptions of controlling teacher behaviours and negative affect.

The mediating role of the motivation regulations between basic need satisfaction/thwarting and dancers' positive and negative affect was also examined. In line with the SDT proposition that the basic needs both directly and indirectly lead to more adaptive forms affective responses (Deci & Ryan, 1985, 2000), it was hypothesized that the motivational regulations would mediate the relationships between basic need satisfaction/thwarting and reported affective states. A sub-aim of the present study was to test an alternative model (Figure 3.1, Model B), proposed and supported by Gunnell et al. (2014), in which the motivation regulations are antecedents to the basic psychological needs.

**Model A**
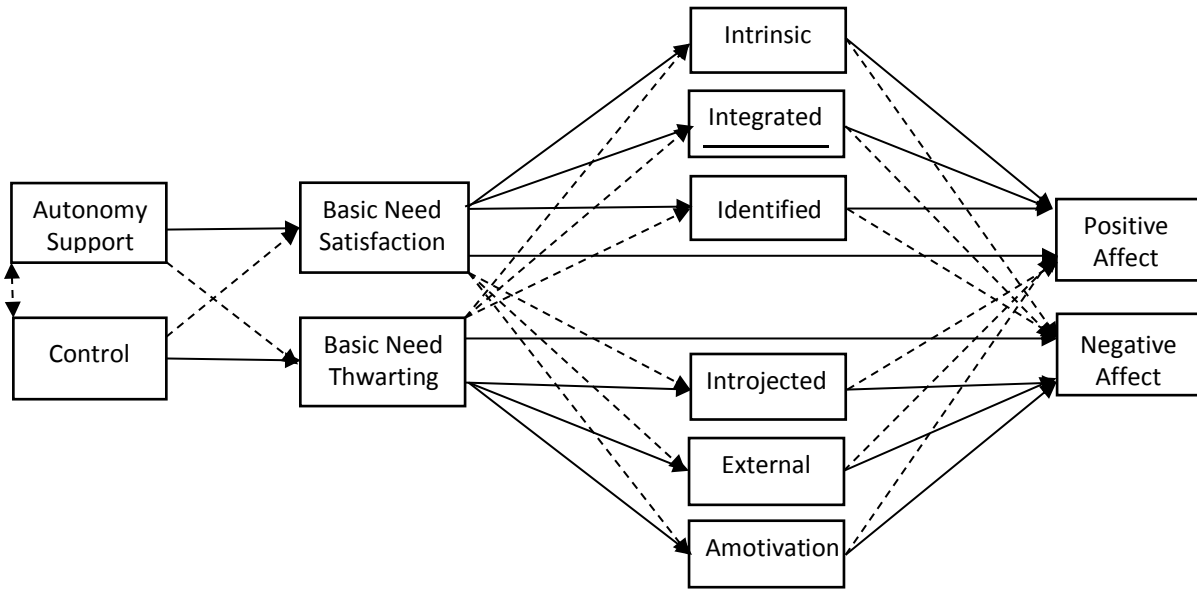


**Model B**
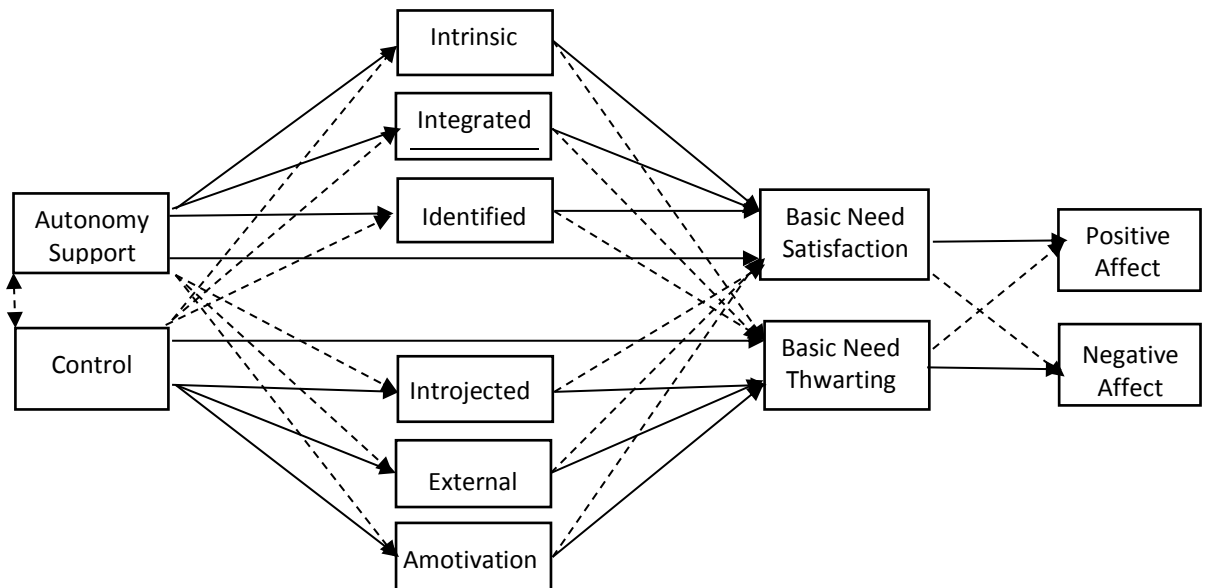


*Figure 3.1.* Hypothesised models A and B. Positive and negative relationships are represented by solid and dashed lines (respectively). Although not included in the figure for visual simplicity, error terms of the motivational regulations were allowed to correlate. This approach is in line with previous research (e.g., Ntoumanis, 2001; Quested & Duda, 2011a) and was considered appropriate as theoretically as the motivational regulations are proposed to be interrelated (Deci & Ryan, 1985).

**Method**

**Participants**

Participants were 260 (11 male, 249 female) recreational dancers aged 10-75 years of age ($M = 20.75$, $SD = 12.34$). Dancers were recruited from recreational dance schools that provide classes in a variety of styles including ballet, tap, jazz, street, freestyle, and ballroom, in the Midlands and South East England. The majority of dancers (82%) reported that they participated in more than one dance style ($M = 3.59$, $range = 1$-11). Dancers had danced for an average of 11.22 years ($SD = 9.32$), attended their current dance school for on average 7.61 years ($SD = 5.70$), and spent on average 5.07 hours ($SD = 3.81$) dancing per week.

**Procedures**

After receiving ethical approval from a university ethics board, private dance schools were contacted and permission requested to invite their dancers (aged 10 years and over) to take part in the project. Once permission was gained, parental consent was obtained for dancers under 16 years of age and informed written consent was secured from all dancers. A multi-section questionnaire, which took approximately 20 minutes to complete, was administered to the consenting dancers by the principal investigator. Dancers were asked to respond to the questionnaires independently and honestly. It was made clear that taking part was voluntary and that all answers would remain confidential.

**Measures**

**Autonomy Support.** Dancers' perceptions of their teachers' autonomy support was measured using the Health Care Climate Questionnaire (HCCQ; Williams et al., 1996) adapted for dance by Quested and Duda (2010). The questionnaire instructed dancers to think about what their main dance teacher normally says or does. Following the stem "During the last month, in this dance group…" dancers responded to 7 items (e.g., "My teacher gives

dancers choices and options") on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The reliability and validity of dancers' scores on this scale have been supported in previous research in dance settings (Quested & Duda, 2010, 2011a, 2011b).

**Perceptions of Controlling Teacher Behaviours.** The 15-item Controlling Coach Behaviors Scale (CCBS; Bartholomew et al., 2010) was used to measure dancers' perceptions of their teachers' controlling behaviours. Dancers responses were scored on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). The wording was subject to minor modifications to make it applicable to dancers. Dancers were asked to consider the kind of atmosphere created by their main dance teacher during the past month. The measure comprises four subscales tapping dimensions of controlling teacher behaviour; controlling use of rewards (e.g., "My teacher only uses rewards/praise so dancers stay focused on tasks during class"), negative conditional regard (e.g., "My teacher is less supportive of dancers when they are not performing well"), intimidation (e.g., "My teacher shouts at dancers in front of others to make them do certain things"), and excessive personal control (e.g., "My teacher expects dancers whole life to centre on their dance participation"). Bartholomew et al. (2010) report the CCBS to have adequate internal consistency, invariance across sport type and gender, and good content and factorial validity.

**Basic Psychological Need Satisfaction.** All measures of basic psychological need satisfaction employed the stem "During the last month, in this dance group I felt..." and were rated on a 7-point Likert scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Minor modifications were made to the wording of some items to make them applicable to dancers. Autonomy satisfaction was measured using six items (e.g., "I felt free to express my ideas and opinions") targeting the degree to which individuals felt that they had choice and could make decisions in terms of their dance engagement (Deci et al., 2001). Previous research with

vocational dancers (Quested & Duda, 2011b, 2011c) has supported the measures internal reliability.

To assess participants' perceptions of their competence in the dance sessions the 5-item perceived competence sub-scale of the Intrinsic Motivation Inventory (IMI; Ryan, 1982) adapted for sport by McAuley, Duncan, and Tammen (1989) was employed. An example item is "after practising a particular routine/movement for a while, I felt pretty competent". Previous research with dancers has reported this measure to produce reliable (Quested & Duda, 2010, 2011b, 2011c) and valid (Quested & Duda, 2010, 2011b) scores.

Satisfaction of the need for relatedness was measured using the 5-item (e.g., "people valued me") acceptance subscale of the Need for Relatedness Scale (NRS-10; Richer & Vallerand, 1998). This scale has been found to demonstrate adequate internal consistency (e.g., Quested & Duda, 2011c) and validity (Quested & Duda, 2010, 2011b) in vocational dance settings.

**Basic Psychological Need Thwarting.** Dancers' basic psychological need thwarting was measured using the 12-item Psychological Need Thwarting Scale (PNTS; Bartholomew, et al., 2011b). The stem and Likert scale were the same as used for basic need satisfaction and a few items were reworded to make the content dance specific (e.g., "training regime" was replaced with "dance schedule"). The measure consists of three subscales; autonomy thwarting (e.g., "I feel pushed to behave in certain ways"), competence thwarting (e.g., "There are situations where I am made to feel inadequate"), and relatedness thwarting (e.g., "I feel rejected by those around me"). In previous research, the PNTS is reported to demonstrate good internal consistency, validity, and invariance marked by gender and sport type (Bartholomew et al., 2011b).

**Motivation regulations.** Dancers' motivation regulations were measured using the 24-item Behavioral Regulation in Sport Questionnaire (BRSQ; Lonsdale et al., 2008). The stem used was "I participate in this dance group…". The BRSQ has 6 subscales each with 4 items; intrinsic motivation (e.g., "because I enjoy it"), integrated regulation (e.g., "because it's part of who I am"), identified regulation (e.g., "because I value the benefits of dance"), introjected regulation (e.g., "because I would feel guilty if I quit"), external regulation (e.g., "because people push me to dance") and amotivation (e.g., "but I question why I continue"). A 7-point Likert scale from 1 (*not at all true*) to 7 (*very true*) was employed. Balaguer and associates (2011) report the BRSQ to have acceptable construct validity in vocational dance contexts.

**Affective outcomes.** The Positive and Negative Affect Scale (PANAS; Watson, Clark, & Tellegen, 1988) was used to tap the extent to which dancers experienced positive affect (e.g., "interested") and negative affect (e.g., "upset"). Dancers were asked to indicate the extent to which they experienced particular emotions when dancing with their group over the past month. The 20 items were rated on a 7-point Likert scale (1 = *not at all* to 7 = *extremely*). Previous research (Quested & Duda, 2010) has demonstrated the PANAS to have adequate reliability and validity when administered to vocational dancers.

**Data Analysis**

Analyses were conducted using SPSS and AMOS version 19 (Arbuckle, 1999). Data were screened for errors, missing values, univariate and multivariate outliers, and normality following the guidelines of Tabachnick and Fidell (2007). Skewness values ranged from -1.27 to 1.69 and kurtosis values ranged from -0.62 to 2.71 meeting the criteria for univariate normality (see Kline, 2010). Mahalanobis distances revealed three multivariate outliers, which were subsequently removed. Missing data accounted for less than 5% and was missing

completely at random (MCAR). Expectation maximization was used to replace missing data as it is considered a reasonable imputation approach for low levels of missing data which is MCAR (Tabachnick & Fidell, 2007).

Descriptive statistics, alpha coefficients, and bivariate correlations were calculated and Confirmatory Factor Analysis (CFA) was conducted to test the factor structure of each measure. Consistent with previous research with athletes (e.g., Balaguer et al., 2012), due to the large number of parameters in the model, path analysis, using scale means as single item indicators, was employed to test the hypothesised models (Figure 3.1). Deci and Ryan (2000) propose that each of the three basic psychological needs are uniquely independent, yet interrelated constructs. Thus, a key consideration is how to model the basic psychological needs for analysis purposes. A range of modelling approaches have been adopted in previous research. Some studies (e.g., Quested & Duda, 2011b) have modelled the basic needs independently and correlated the error terms in order to account for shared error variances. In other studies (e.g., Balaguer et al., 2012; Bartholomew et al., 2011a) a composite value to represent overall satisfaction of the three basic needs has been created. Modelling the motivation regulations, basic psychological need satisfaction and basic psychological need thwarting with each regulation and each need modeled independently would result in a highly complex model (i.e., with 89 parameters to be estimated, with 63 degrees of freedom). Thus, considering the argument by Raykov and Marcoulides (2000) that each additional degree of freedom gives the model greater potential for error and rejection it was decided to test a more parsimonious model by utilizing composite scores for basic psychological need satisfaction and thwarting. The three basic need satisfaction scales were used to create a composite latent variable representing basic psychological need satisfaction, and basic psychological need thwarting was modelled as a latent factor comprised of the sum of the three PNTS subscales.

A key focus of this paper was to build on the findings of Study 2 and examine the predictive utility and mediational role of each of the motivation regulations. This was a key focus because examination of the predictive utility attributable to each of the motivation regulations may enhance understanding of the possible causal mechanisms for variability in individuals' quality of motivation and emotional experiences in dance. Therefore, the motivation regulations were modeled independently to enable exploration of these research questions. This resulted in a hypothesised model with 59 parameters to be estimated and 31 degrees of freedom. However, it should be acknowledged that the decision to model the motivation regulations independently may not be in line with a parsimonious model.

Fit indices were examined to establish whether the data demonstrated an adequate fit to the model. Considering the sample size in the present study (n = 257), when determining model fit the Comparative Fit Index (CFI) and Standardized Root Mean Square Residual (SRMR) were used as the primary consideration as they have been found to perform relatively well in small samples (Hu & Bentler, 1999). CFI values > .90 and SRMR values < .06 provide evidence for a model with good fit to the data (Hu & Bentler, 1999).

Multiple mediation analysis was conducted to firstly examine whether dancers' experiences of basic psychological need satisfaction and thwarting mediated the relationships between dancers' perceptions of their teachers' interpersonal style and dancers' affective states. Secondly, the mediating role of the motivation regulations between dancers' basic need satisfaction/thwarting and reported affect was tested. As the motivation regulations were found to conform to a simplex pattern (Ryan & Connell, 1989), error terms were allowed to covary in order to get unbiased estimates of indirect effects (Preacher & Hayes, 2008). To test for multiple mediation a bootstrapping procedure was employed (Preacher & Hayes, 2008). The bootstrapping technique is recommended over the commonly used Baron and Kenny

(1986) and product-of-coefficients (Sobel, 1986) methods as it maintains reasonable control over Type 1 error rates, reduces the likelihood of parameter bias as a result of omitted variables and does not rely on the assumption of multivariate normality (Preacher & Hayes, 2008; Shrout & Bolger, 2002). As recommended by Preacher and Hayes (2008), bias-corrected and accelerated 95% confidence intervals (BCa 95% CI) were used and 5000 bootstrapped samples requested. Total, direct, indirect, and specific indirect mediation effects were calculated in AMOS. Specific indirect effects for each mediation path were examined using the phantom model approach (Macho & Ledermann, 2011). This approach enables specific indirect effects to be tested in AMOS and involves creating a new latent variable model for each specific effect to be tested (i.e., each motivation regulation pathway) and constraining parameter estimates to those within the primary model (Macho & Ledermann, 2011).

## Results

### Descriptive Statistics

Descriptive statistics, alpha coefficients, and bivariate correlations for the sample are displayed in Table 3.1. With the exception of the identified regulation subscale of the BRSQ ($\alpha = .67$), all Cronbach's alphas were $> .70$ indicating acceptable internal reliability. The alpha co-efficient for the identified regulation subscale is considered to be within the lower level of acceptability for established scales with few items (Hair et al., 2006). However, results stemming from this subscale should be interpreted with caution.

The mean scores indicated that dancers on average over the previous 4 weeks, perceived their main dance teacher to display relatively high levels of autonomy support and low levels of controlling behaviours. Typically dancers reported moderate-high levels of basic

Table 3.1

*Descriptive Statistics, Internal Reliability Coefficients, and Bivariate Correlations for Study Variables*

| Variable | M | Min | Max | SD | α | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Range | | | | | | | | | | | | | | |
| 1. Autonomy Support | 3.82 | 1.86 | 5.00 | .63 | .80 | | | | | | | | | | | |
| 2. Control | 1.95 | 1.00 | 4.27 | .64 | .88 | -.29** | | | | | | | | | | |
| 3. Basic Need Satisfaction | 4.97 | 2.56 | 7.00 | .85 | .75 | .54** | -.24** | | | | | | | | | |
| 4. Basic Need Thwarting | 2.35 | 1.00 | 5.08 | .96 | .79 | -.30** | .66** | -.39** | | | | | | | | |
| 5. Intrinsic motivation | 6.51 | 4.00 | 7.00 | .60 | .73 | .37** | -.36** | .48** | -.35** | | | | | | | |
| 6. Integrated regulation | 5.33 | 1.00 | 7.00 | 1.15 | .79 | .28** | -.05 | .44** | -.03 | .43** | | | | | | |
| 7. Identified regulation | 5.47 | 3.00 | 7.00 | 1.02 | .67 | .23** | .05 | .28** | -.03 | .31** | .55** | | | | | |
| 8. Introjected regulation | 2.28 | 1.00 | 7.00 | 1.36 | .81 | -.17** | .46** | -.22** | .48** | -.33** | -.10 | -.01 | | | | |
| 9. External regulation | 1.63 | 1.00 | 5.00 | .88 | .76 | -.19** | .38** | -.25** | .46** | -.33** | -.09 | -.06 | .61** | | | |
| 10. Amotivation | 1.65 | 1.00 | 5.00 | .94 | .78 | -.21** | .35** | -.36** | .45** | -.47** | -.22** | -.18** | .56** | .55** | | |
| 11. Positive affect | 5.60 | 1.90 | 7.00 | .94 | .83 | .45** | -.21** | .50** | -.32** | .45** | .33** | .33** | -.35** | -.41** | -.47** | |
| 12. Negative affect | 1.84 | 1.00 | 4.80 | .78 | .88 | -.21** | .45** | -.33** | .64** | -.32** | -.05 | -.09 | .37** | .39** | .42** | -.28** |

*Note.* ** = $p < .001$

psychological need satisfaction and moderate-low levels of need thwarting. Mean scores for

dancers' more autonomous motivation regulations (i.e., intrinsic, integrated, and identified

regulations) were above the midpoint. Whereas, dancers' mean scores for the more controlled

motivation regulations (i.e., introjected and external) and amotivation were below the

midpoint. These findings indicate recreational dancers' motivations for engagement to

generally be highly self-determined. In general, dancers reported high levels of positive and

low levels of negative affect. Correlations between the motivation regulations corresponded

with a simplex pattern, meaning they were more strongly correlated with the regulations that

are closer on the self-determination continuum than those theoretically assumed to be further

away (Ryan & Connell, 1989).

**Construct Validity**

Measures of perceived teacher control (CFI = .93), autonomy satisfaction (CFI = .99),

competence satisfaction (CFI = .99), relatedness satisfaction (CFI = 1.00), and need thwarting

(CFI = .91) all demonstrated acceptable construct validity. The measures of autonomy support

(CFI = .88), and positive (CFI = .87) and negative affect (CFI = .89), initially revealed poor fit

to the data. Modification indices were taken into consideration and when deemed to make

theoretical and empirical sense, error terms were correlated. Modification indices

recommended correlating error terms of the autonomy support items 'My teacher encourages

dancers to ask questions' and the item 'When my teacher asks dancers to do something, he or

she tries to explain why this would be good to do'.  A key aspect of autonomy support is

ensuring that participants understand the rationale underpinning the activity (Mageau &

Vallerand, 2003). Both these items capture whether dancers' perceive their teacher to be

interested in whether the dancers understand the rationale for the activity/focus of the class.

Thus, it is theoretically plausible that the error terms for these items may share variance

because if a teacher is willing to take the time to explain things then they are likely to also take time to encourage dancers to ask questions. After modification the model demonstrated acceptable fit to the data (CFI = .91). For the measure of positive affect the error terms of the items 'Alert' and 'Attentive' allowed to covary resulting in a CFI of .91. The rationale for correlating these error terms is that both feeling alert and attentive are to do with the focus of attention and thus theoretically could be considered inter-related constructs. For the measure of negative affect, based on the modification indices and the fact that 'Jittery' is a synonym for 'Nervous' the error terms of these items were allowed to covary. Subsequently, the measure of negative affect (CFI = .90) demonstrated acceptable fit to the measurement model. For continuity of testing the factor structure of all measures within this study in the same way, initially the factor structure of the BRSQ data was analysed as continuous data using AMOS. These analyses revealed the construct validity of the BRSQ to be poor (CFI = .87). Thus, following the recommendations of study 1, due to large item floor and ceiling effects, the BRSQ data were analysed as ordered categorical data using Mplus as AMOS currently does not have the option to treat data as categorical. When analysed as ordered categorical the six-factor model demonstrated acceptable fit to the data (CFI = .94). These findings provide further support the contention that when large floor and ceiling effects are present (especially when data are skewed in opposite directions) data should be analysed as categorical.

**Path Analysis**

Model A (Figure 3.1) demonstrated excellent fit to the data ($X^2$ (20) = 71.12, $p < .001$; CFI = .96; SRMR = .04). See Figure 3.2 for standardized coefficients of significant paths. The model explained 39% of variance in dancers' reported positive affect and 43% of variance in dancers' negative affect. Non-significant paths were between dancers' perceptions of their teachers' controlling behaviours and basic psychological need satisfaction ($\beta$ = -.09, $p$ = .10);

basic psychological need satisfaction and introjected ($\beta$ = -.03, *p* = .59) and external ($\beta$ = -.08, *p* = .18) regulations; basic need thwarting and dancers' identified regulation ($\beta$ = .09, *p* = .13); dancers' integrated ($\beta$ = .01, *p* = .84) and introjected ($\beta$ = -.06, *p* = .38) motivation regulations and reported positive affect; and dancers' intrinsic ($\beta$ = -.05, *p* = .36), integrated ($\beta$ = .06, *p* = .35), identified ($\beta$ = -.06, *p* = .28), introjected ($\beta$ = -.01, *p* = .84), and external ($\beta$ = .07, *p* = .29) regulations and negative affect. Removal of non-significant paths resulted in a slight decrease in the fit of the data ($X^2$ (31) = 81.66, *p* < .001; CFI = .96; SRMR = .07). However, the CFI remained within Hu and Bentler's (1999) cut-off criteria for excellent fit.

Model B (Figure 3.1), with non-significant paths included, demonstrated acceptable fit to the data ($X^2$ (20) = 107.719, *p* < .001; CFI = .93; SRMR = .07). See Figure 3.3 for standardized coefficients of significant paths. The model explained 25% of variance in dancers' reported positive affect and 40% of variance in dancers' negative affect. Removal of all non-significant paths resulted in a slight decrease in the model fit to the data ($X^2$ (32) = 122.63, *p* < .001; CFI = .92; SRMR = .08). The final model (Figure 3.3) explained 24% of variance in dancers' reported positive affect and 40% of variance in dancers' negative affect. As model A was superior to that of model B, both in terms of model fit and percentage of variance explained, subsequent analysis was conducted based on relationships between variables in model A.

**Multiple Mediation**

**Mediating role of the Basic Psychological Needs**. There was a significant total/indirect effect ($\beta$ = .25, *SE* = .04, BCa 95% CI .17, .32, *p* < .01) of dancers' perceptions of autonomy support on positive affect. Basic psychological need satisfaction significantly mediated the relationship ($\beta$ = .15, *SE* = .04, BCa 95% CI .08, .24, *p* < .01) between dancers' perceptions of autonomy support and positive affect. There was a significant total/indirect

effect ($\beta$ = .39, *SE* = .04, BCa 95% CI .32, .46, *p* < .001) of dancers' perceptions of controlling teacher behaviours on dancers' experiences of negative affect. Basic psychological need thwarting was a significant mediator ($\beta$ = .35, *SE* = .04, BCa 95% CI .27, .44, *p* < .001) in the relationship between dancers' perceptions controlling teacher behaviours and reported of negative affect.

**Mediating role of the Motivation Regulations**. There was a significant total effect of dancers' basic need satisfaction on positive affect ($\beta$ = .44, *SE* = .05, BCa 95% CI .33, .54, *p* < .01). The total effect was made up of the direct effect ($\beta$ = .28, *SE* = .06, BCa 95% CI .18, .43, *p* < .01) and indirect effect via the motivation regulations ($\beta$ = .15, *SE* = .04, BCa 95% CI .07, .24, *p* < .01). Of the motivation regulations, identified regulation ($\beta$ = .06, *SE* = .03, BCa 95% CI .02, .13, *p* < .01) and amotivation ($\beta$ = .04, *SE* = .02, BCa 95% CI .01, .09, *p* < .01) significantly mediated the relationship.

There was a significant total effect of dancers' basic need thwarting on negative affect ($\beta$ = .62, *SE* = .04, BCa 95% CI .53, .69, *p* < .01). The direct effect was significant ($\beta$ = .54, *SE* = .05, BCa 95% CI .44, .65, *p* < .005). However the indirect effect was non-significant ($\beta$ = .08, *SE* = .04, BCa 95% CI -.01, .16, *p* = .059) with none of the motivation regulations significantly mediating the effect.
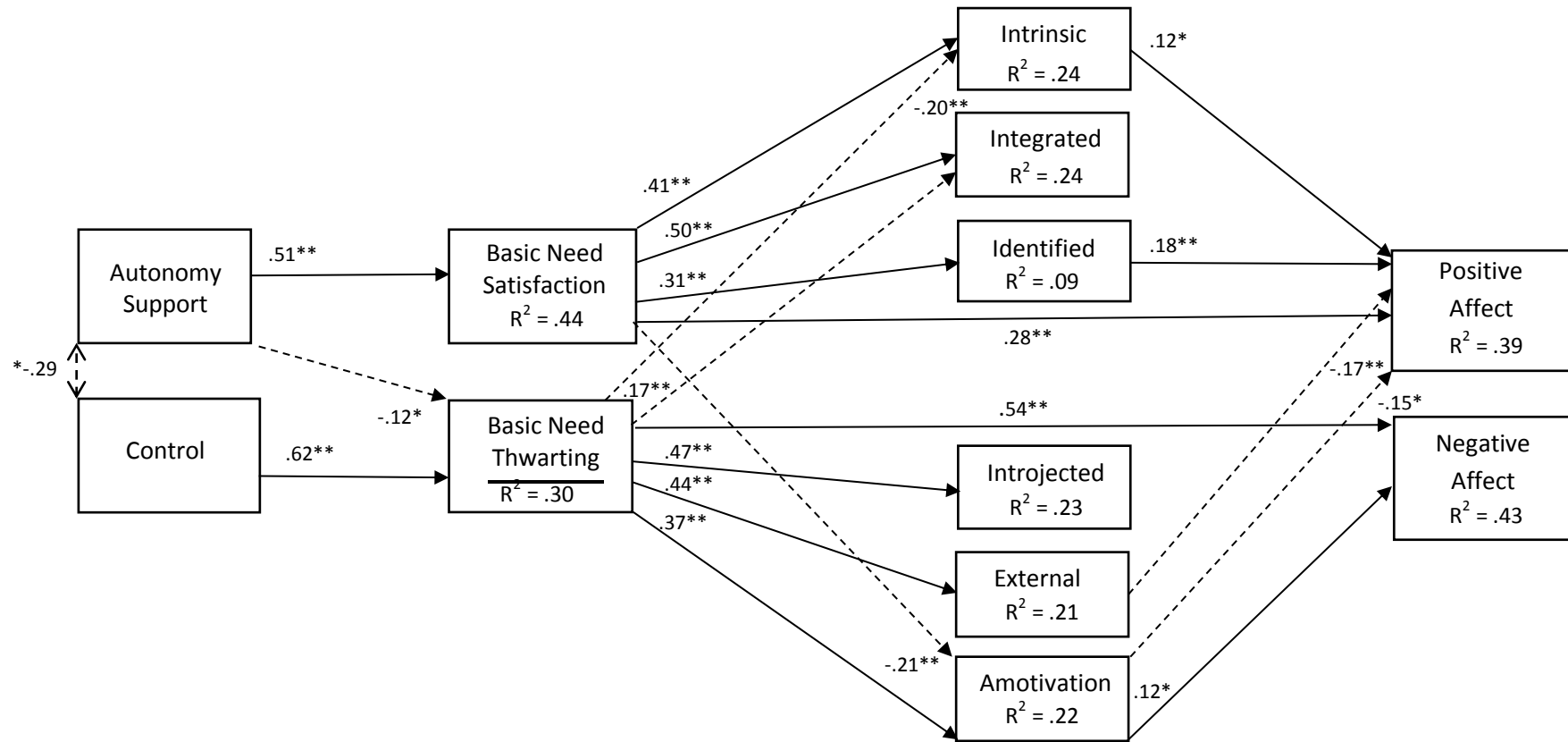
*Figure 3.2.* Model A. Path analysis results. All significant standardized coefficients are presented (* = *p* < .05, ** = *p* < .01). Positive and negative relationships are represented by solid and dashed lines (respectively). For visual simplicity error terms are not presented in the figure. Correlations between the error terms in the model were as follows: IN↔IG = .33, IN↔ID = .24, IN↔IJ = -.19, IN↔EX, = -.19, IN↔AM = -.32, IG↔ID = .49, IG↔IJ = -.10, IG↔EX = -.05, IG↔AM = -.15, ID↔IJ = .02, ID↔EX = -.03 ID↔AM = -.12, IJ↔EX = .50, IJ↔AM = .44, EX↔AM = .42.

*Note.* IN = Intrinsic, IG = Integrated, ID = Identified, IJ = Introjected, EX = External, AM = Amotivation
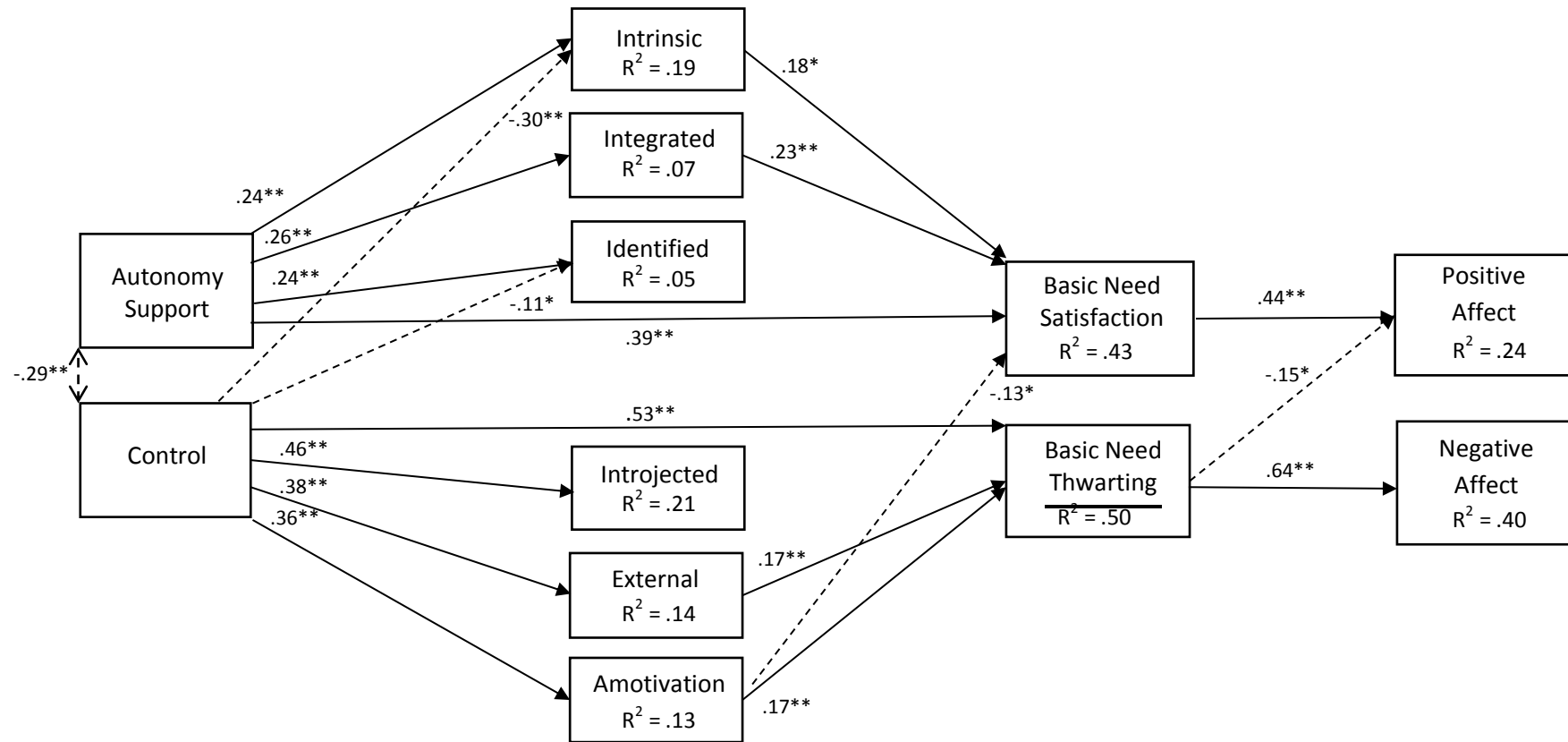
*Figure 3.3.* Model B. Path analysis results All significant standardized coefficients are presented (* = *p* < .05, ** = *p* < .01). Positive and negative relationships are represented by solid and dashed lines (respectively). For visual simplicity error terms are not presented in the figure. Correlations between the error terms in the model were as follows: IN↔IG = .39, IN↔ID = .31, IN↔IJ = -.19, IN↔EX, = -.22, IN↔AM = -.38, IG↔ID = .52, IG↔IJ = -.08, IG↔EX = -.05, IG↔AM = -.19, ID↔IJ = -.03, ID↔EX = -.07 ID↔AM = -.18, IJ↔EX = .53, IJ↔AM = .48, EX↔AM = .48.

*Note.* IN = Intrinsic, IG = Integrated, ID = Identified, IJ = Introjected, EX = External, AM = Amotivation

**Discussion**

Drawing from SDT, the purpose of this study was to explore the psychosocial mechanisms linking teachers' interpersonal style to recreational dancers' affective states. This study tested two hypothesized SDT-based models (Figure 3.1). A model in which recreational dancers' perceptions of their teachers' autonomy supportive and controlling behaviours predict dancers' basic need satisfaction and/or thwarting, which in turn, both directly and indirectly (via the motivational regulations) predict dancers' reported positive affect and negative affect was found to have the best fit to the data. The mediating role of dancers' basic psychological need satisfaction/thwarting was supported in the relationships between teacher autonomy supportive and controlling behaviours and dancers' affective states. Furthermore, identified regulation and amotivation significantly mediated the relationship between dancers' basic need satisfaction and positive affect. Thus, the findings of this study provide initial support for the tenets of SDT in recreational dance settings. Moreover, they suggest that theoretically, basic need thwarting may operate differently to need satisfaction, playing a more direct role in the prediction of negative affect.

**The Role of the Social-Environment and Basic Psychological Needs**

On inspection of mean scores, this study revealed relatively high levels of perceived autonomy support and low levels of perceived teacher control. This finding is in contrast to the typical stereotype of dance teachers as demanding, autocratic figures (Van Rossum, 2004) and generally paints a positive picture of teaching practices in recreational dance contexts. However, it is important to note that there was variation in the dancers' perceptions of teachers' interpersonal styles (autonomy support range = 1.86 - 5.00; control range = 1.00 - 4.27), suggesting that not all dancers perceived the social environment created by their dance teachers to be high in teacher autonomy support and low in control. Therefore, the findings

highlight that there is a need for dance teacher education on how to integrate autonomy supportive approaches and avoid controlling behaviours in dance teaching practices.

Aligned with BPNT (Deci & Ryan, 2000) and previous research in sport settings (e.g., Balaguer et al., 2012; Bartholomew et al., 2011a, 2011b), the relationship between dancers' perceptions of autonomy support and positive affect was mediated by the fulfilment of dancers' basic psychological needs. Furthermore, the active thwarting of dancers' psychological needs mediated the relationship between perceived controlling teacher behaviours and dancers experiences of negative affect. The findings suggest that when teachers are autonomy supportive (i.e., provide dancers with opportunities for choice, acknowledge their perspectives and encourage self-directed behaviours), then recreational dancers are more likely to report feeling autonomous, competent and related to those around them and thus experience positive emotions. Whereas, when dance teachers are controlling (i.e., behave in a coercive manner and assert their control), recreational dancers are more likely to feel that their basic needs are actively being impeded and undermined, and hence may experience negative emotions. Therefore, the findings suggest that the satisfaction and/or thwarting of dancers' basic needs is the psychological mechanism linking dancers' perceptions of teachers interpersonal style with their emotional experiences in recreational dance.

This is the first study to examine the role of controlling teacher behaviours in dance contexts and the results highlight the detrimental psychological impact teachers could have on dancers if they exhibit highly controlling behaviours. Furthermore, the findings emphasise the importance of dance researchers measuring dancers' perceptions of teacher control and basic need thwarting when examining predictors of ill-being, as they better account for variation in potentially maladaptive outcomes. For example, in this study, teacher control and basic need

thwarting accounted for 40% of variation in dancers' reported negative affect, whereas, autonomy support and basic need satisfaction explained only 11% of variation in this outcome.

**Motivational Regulations and Affective States**

In line with the SDT-based hypothesis, and previous research in sport, exercise, and physical education settings (e.g., Blanchard et al., 2009; Edmunds et al., 2006; Ntoumanis, 2005), dancers' basic need satisfaction both directly and indirectly (via the motivation regulations) predicted dancers' positive affect. Modelling the motivation regulations independently allowed for examination of the predictive ability and distinct role attributable to each motivation regulation. Findings revealed identified regulation and amotivation to significantly mediate the relationship between dancers' basic need satisfaction and reported positive affect. Hence, in a recreational dance context if dancers' feel that their basic psychological needs are satisfied, then they are more likely to freely engage in their dance group/class because they identify with the associated benefits, less likely to lack intention to engage, and hence, more likely to experience positive emotions.

To our knowledge, this is the first study to examine the mediating role of the motivation regulations between basic need thwarting and affective states in any context. In contrast to the hypothesised model basic need thwarting positively predicted dancers' integrated regulation. Conceptually it is hard to explain why dancers' who feel that their basic needs are generally undermined in classes may feel motivated to participate for integrated reasons. Examination of the bivariate relationship revealed a non-significant negative correlation. These results indicate that suppression or multi-collinearity within the multivariate model may have produced this anomalous finding. Future research further

investigating the relationship between basic need thwarting and integrated regulation would clarify this speculation.

Contrary to the hypothesis, dancers' motivation regulations did not mediate the relationship between dancers' basic need thwarting and negative affect. Instead there was a strong direct effect of basic need thwarting on dancers' negative affect. Hence, when dancers' basic psychological needs are thwarted, this may have such an impact that it directly leads to dancers' experiencing negative emotions when dancing with their group, irrespective of the reasons for their dance engagement. Theoretically, these results suggest that basic need thwarting may operate differently to basic need satisfaction and play only a direct role in the prediction of affective states. Hence, it is vital that future research examine individuals' basic need thwarting as this is an under-studied area which is of conceptual and practical importance. Future research examining the mediating role of the motivation regulations between basic need thwarting and other cognitive (e.g., self-esteem) and behavioural outcomes (e.g., attendance to dance sessions) would further enhance understanding of the possible causal mechanisms for variability in individuals' experiences in sport, physical activity, and dance contexts.

The non-significant mediating role of the motivation regulations between dancers' experiences of basic need thwarting and negative affect may be due to the non-significant and relatively weak relationships between dancers' motivation regulations and reported negative affect. It is important to note that previous research (e.g., Ntoumanis, 2001; Teixeira, Carraça, Markland, Silva, & Ryan, 2012) has also found controlled motivation to have little predictive effect on maladaptive outcomes. It may be that a stronger relationship between controlled motivations and maladaptive emerges overtime.  For example, Gunnell et al. (2014) report that over a six month period changes in individuals' controlled motivation predicted changes

in experiences of negative affect. Thus, the weak relationships between dancers' controlled

motivations and negative affect within the present study may be due to the cross-sectional

design. To address this hypothesis, future research could employ a multi-wave longitudinal

design to further explore the role of controlled motivation in accounting for variation in

indices of dancers' ill-being.

A sub-aim of the present study was to test an alternative model (Figure 3.1, Model B),

previously proposed and supported by Gunnell et al. (2014), in which the motivation

regulations are considered as antecedents to the basic psychological needs. The results

revealed the model to have acceptable fit to the data (CFI = .92). However, Model A was

found to have a greater fit, thus, is considered to better account for the data. Furthermore,

although both models explained similar variance in dancers' negative affect (40% vs. 43%),

Model A explained 15% more variance in dancers' positive affect compared to that accounted

for by model B. The present findings support Vallerand's (1997) hierarchical model of

intrinsic and extrinsic motivation, OIT, and previous research (e.g., Edmunds, Ntoumanis, &

Duda, 2006; Ng et al., 2012; Vallerand & Losier, 1999) which considers individuals' basic

psychological needs to facilitate the process of internalisation and determine individuals'

quality of motivation.

**Limitations**

Although this study provides important insights into the determinants and

consequences of the motivational processes involved in recreational dance participation, it is

not without limitations. Due to the size of the sample and number of variables in this study it

was not possible to conduct analyses using structural equation modelling (SEM), which

controls for measurement error. Kline (2010) recommends a sample size of 5-20 times the

number of parameters to be estimated, hence, a sample greater than 1000 would be needed in

order to test the hypothesised theoretical model using SEM. Moreover, due to the present study being exploratory nature a cross-sectional design was adopted, hence, causality cannot be inferred. Furthermore, as all measures were self-report questionnaires, the results may be subject to common method variance (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Error terms were correlated in a few of the measures (i.e., autonomy support, motivation regulations, and positive and negative affect), due to initial poor fit to the data. Although error terms were only correlated when deemed to make theoretical and empirical sense, correlating error terms in a cross-sectional study can artificially inflate fit indices, hence the findings should be interpreted with caution. The questionable construct validity of some of the measures with dancers highlights the value of conducting a comprehensive examination the psychometric properties of measures, such as the BRSQ, which were originally developed for use in other populations.

**Conclusions and Practical Implications**

Overall, this study provides initial support for the applicability of the extended SDT model in the case of recreational dance. The findings highlight the importance of including measures of perceived teacher control and basic psychological need thwarting in future research with dancers in order to better account for variability in maladaptive outcomes. The present findings enhance understanding of the motivational processes involved in recreational dance participation and have important practical implications for the promotion of healthful engagement. In order to foster dancers' more self-determined motivations, the findings suggest that teachers should be encouraged to create an environment which is conducive to satisfying rather than thwarting individuals' basic psychological needs. Dance teachers can do this by exhibiting more autonomy supportive and reducing/eliminating controlling behaviours. Future research, which develops and evaluates an SDT-based intervention

educating dance teachers as to how they can create and sustain an autonomy supportive

teaching environment would be the next key step in the path towards promoting quality of

engagement and psychological well-being in recreational dance contexts.

**Assessment of the content validity of the Perceived Motivational Climate in Sport**

**Questionnaire-2 in dance settings: A think aloud approach**

**Abstract**

Objectives: The Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2; Newton, Duda, & Yin, 2000) adapted for dance by Quested and Duda (2009a) has been employed in a variety of dance settings. However, the content validity of the measure and relevance of particular subscales (e.g., intra-team member rivalry) have been questioned (Quested & Duda, 2010). Thus, the aims of this study were twofold: firstly examine the content validity of the PMCSQ-2 across a variety of dance populations, identifying any problematic items, and the nature and frequency of such problems experienced by dancers whilst completing the measure. Secondly, to determine whether the sub-dimensions of task- and ego-involving climates captured in the subscales of the PMCSQ-2 are relevant and meaningful in dance contexts.

Method: Think aloud interviews were conducted with 21 dancers (10 male, 11 female) from a variety of dance settings. Think-aloud interviews were transcribed and analysed according to the recommendations of Someren, Barnard, and Sandberg (1994).

Results: The majority (72%) of participant responses to the items revealed no problems with understanding, interpretation, retrieval, judgment, or responding. Items on the intra-team member rivalry subscale were the most challenging in terms of frequency of problems. The dancers' thoughts articulated 'out loud' indicated that they had trouble judging what response to give due to the varied nature of performance in dance.

Discussion: The implications for use of the PMCSQ-2 in dance, and other contexts (i.e., sport and exercise) and important issues for researchers to consider when designing and using self-report questionnaires are discussed.

Keywords: Measurement, Dance, Motivational Climate, Validity, 'think aloud'

The relevance of the motivational climate created by coaches and teachers for supporting the achievement strivings and psychological well-being of those engaged in sport (e.g., Boyce, Gano-Overway, & Campbell, 2009), physical activity (e.g., Ntoumanis & Biddle, 1999), and dance (e.g., Quested & Duda, 2010) has been widely recognised. To date, the most popular measure of the motivational climate applied in sport and dance research is the Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2; Newton, Duda, & Yin, 2000). The reliability and factorial validity of the PMCSQ-2 has been supported in various competitive sport settings (e.g., Newton et al., 2000; Reinboth & Duda, 2006; Vazou, Ntoumanis, & Duda, 2006). The PMCSQ-2 (adapted for dance by Quested & Duda, 2009) has also been employed in a variety of dance settings including, elite/vocational dance (Carr & Wyon, 2003; Quested & Duda, 2009a, 2010), Centres of Advanced Training (CAT; Nordin-Bates, Quested, Walker, & Redding, 2012), and community dance (Norfield & Nordin-Bates, 2012). However, the reliability and validity of the PMCSQ-2 when utilised in research involving dancers has been questioned (Quested & Duda, 2010).

The PMCSQ-2 was originally designed for use in competitive sport contexts; hence, the phrasing or examples used in the items may not be representative of 'reality' in dance contexts. Furthermore, Quested and Duda (2010) report psychometric issues (i.e., cross-loading) with the items from the intra-team rivalry subscale and question whether the wordings of the items in the PMCSQ-2 capture the construct of intra-team rivalry as it may be realised in dance settings. For example, Quested and Duda (2010) propose that due to the subjective nature of dance performance, dancers may have trouble with the interpretation and comprehension of the idea of "outperforming" other dancers.

The results of research are only as valid as the measures used; therefore, it is of critical importance that the measure of the motivational climate in dance is robust in order for future

researchers to confidently examine key social-environmental predictors of dancers' optimal development, performance, and well-being. Hence, the aims of the current study were twofold; firstly to examine the content validity of the 33-item PMCSQ-2 (as adapted for dance by Quested & Duda, 2009a) across a variety of dance populations, to identify any problematic items, and to reveal the nature and frequency of such problems experienced by dancers whilst completing the measure. Secondly, to determine whether the underlying themes of task- and ego-involving motivational climates captured in the subscales of the PMCSQ-2 are relevant and meaningful in dance contexts.

**Motivational Climate**

The concept of the 'motivational climate' is originally derived from work stemming from achievement goal theory (AGT; Ames, 1992; Nicholls, 1989). The 'perceived motivational climate' was employed as a phrase to capture the prevailing goal structure that a student, athlete or dancer views to be operating in the achievement context (Ames, 1992). More specifically, Ames (1992) conceptualised the motivational climate as represented by a hierarchical framework, with two higher order dimensions (task-involving and ego-involving features). Nicholls (1984) considered competence to be an important prerequisite for motivated behaviour. Thus, task- and ego-involving dimensions of the motivational climate were hypothesised to have an impact on how individuals' construe their competence in achievement settings; whether it is self-referenced (task-involved goal perspective) or other-referenced (ego-involved goal perspective).

A task-involving climate is one in which  significant others (i.e., teacher/coach) positively reinforce effort and skill development, cooperative learning, and each individual having an important role (Ames, 1992; Newton et al., 2000). Encouraging self-referenced judgements of ability promotes the adoption a more task-focused goal involvement in which

mastery and improvement are considered criteria for success (Nicholls, 1989). Task-involved

individuals are more likely to exhibit adaptive achievement behaviours such as working hard

and persevering in challenging situations, regardless of the performers' perceived level of

ability (Duda & Hall, 2001; Nicholls, 1989). Hence, task-involving climates have found to be

predictive of benefits, such as, greater self-determined motivation for engagement in physical

education (e.g., Standage et al., 2003) and higher levels of positive affect in vocational

dancers (e.g., Quested & Duda, 2010).

In contrast, an ego-involving climate is one in which significant others punish

mistakes, encourage normative comparison, and give unequal recognition (Newton et al.,

2000). It is assumed that ego-involving motivational climates foster the development of a

more ego-focused goal involvement as a result of the focus on normative comparison as a

judge of competence. An ego focus is hypothesised to be maladaptive regardless of whether

the individual perceives themselves to be high or low in ability (Nicholls, 1989).  Ego-

involved individuals who perceive themselves as low in ability may not believe that they can

perform better than their peers. As a result they may display maladaptive achievement

behaviours such as exerting little or any effort, avoiding challenges or dropping out in order to

avoid demonstrating incompetence (Nicholls, 1989). However, if an individual's perception

of ability is high then he/she will try and use the least amount of effort to demonstrate

superiority and competence in comparison to others (Roberts, 2012). Hence, ego-involving

motivational climates are associated with negative outcomes such as, lower levels of self-

determined motivation and greater intentions to dropout (Sarrazin et al., 2002).

**Application of the PMCSQ-2 in Dance Contexts**

Interest in the motivational climate in dance contexts began in 2003 with the work of

Carr and Wyon who examined the impact of motivational climate on dance students'

achievement goals, trait anxiety, and perfectionism. Carr and Wyon (2003) measured the

climate via the PMCSQ-2 with minor re-wordings to suit the vocational dance setting. The

PMCSQ-2 was also independently reworded by Quested and Duda (2009a). Alterations to the

wording of the measure to suit elite and vocational dance environments included replacing

"On this team" with "In this dance school/company", "coach" with "teacher", "player" with

"dancer", and "game" with "performance". Certain items had to be further adapted to make

them applicable to dance contexts. For example the item "On this team, only the players with

the best 'stats' get praise" is not easily adaptable as dancers do not have an objective measure

via which they rank performance (i.e., game 'stats'). Therefore, the item was re-worded to

"Only the best dancers get praise". By removing reference to 'stats' this leaves what

participants use as their gauge of "the best dancer" when completing this item open to

interpretation.

To date, only two studies (Nordin-Bates et al., 2012; Quested & Duda, 2010) have

conducted confirmatory factor analysis (CFA) to assess the factorial validity of the PMCSQ-2

when it has been employed with dancers. In their work with vocational dancers, Quested and

Duda (2010) found the PMCSQ-2 to have poor construct validity. Two of the items ["The

teachers think that only the lead dancers contribute to the success of a performance" and

"Each dancer feels as if he/she is an important team member"] loaded poorly onto the

intended factors and were removed from analyses. Quested and Duda (2010) also report that

two of the items measuring the dancers' perceptions of 'intra-team member rivalry' ["Dancers

are encouraged to outperform the other dancers" and "Dancers are "fired up" (positively

excited) when they perform better than their fellow dancers in a performance"] loaded onto

other factors. Quested and Duda (2010) propose these cross loadings may be attributable to

the applicability of item content to dance, due to the dancers having trouble with the

interpretation and comprehension of the idea of "outperforming" other dancers. Quested and Duda (2010) removed the intra-team rivalry dimension from further analyses in their study because they believed that intra-team rivalry may be less relevant to vocational dancers than to sports team members.

Subsequently, the intra-team rivalry scale was omitted in research with dancers in CAT (Nordin-Bates et al., 2012; Walker et al., 2011) and community (Norfield & Nordin-Bates, 2012) dance settings. Without the intra-team rivalry scale, Nordin-Bates et al. (2012) reported that with minor modifications (the addition of three correlations between error terms) CFA supported the construct validity of the PMCSQ-2 with CAT dancers. On the one hand, removal of items that were not accurately measuring the constructs they were intended to measure will have strengthened the validity of the PMCSQ-2 with the sample of dance students in Quested and Duda's (2010) study. However, on the other hand, by dropping the intra-team rivalry construct researchers (Nordin-Bates et al., 2012; Norfield & Nordin-Bates, 2012; Quested & Duda, 2010) have changed the measure so that it cannot assess the motivational climate as originally intended. The arbitrary selection of factors increases the indeterminacy (i.e., lack of clarity and continuity) in the factors (Velicer & Jackson, 1990), and hence, weakens the validity of the measure. Moreover, by omitting the intra-team rivalry subscale, these studies have failed to measure an important feature originally revealed to contribute to the prevalence of ego-involving climates in sport. Therefore the measurement of the climate in previous research with dancers (e.g., Nordin-Bates et al., 2012; Norfield & Nordin-Bates, 2012; Quested & Duda, 2010) cannot be inferred as representative of all aspects of the climate as defined in the original hierarchical model. Although Quested and Duda (2010) hypothesise that this feature of the environment may be less relevant in student dance settings, this may not be the case in reality. It may simply be that intra-team rivalry in

dance would be better captured with more dance specific items than re-works of the sport items from the PMCSQ-2. Thus, it is unknown whether this feature of the environment is equally relevant in dance as it is in sport contexts. Thus, it would be prudent to identify whether intra-team rivalry is a feature of ego-involving climates which is meaningful in dance settings.

**Summary and Aims**

In order for future researchers to confidently examine key social-environmental predictors of dancers' optimal development, performance, and well-being, it is important that measures of the motivational climate in dance are robust. Quantitative psychometric assessments rely on respondents interpreting the meaning of the questions as intended (Hughes, 2004). However, previous research (Quested & Duda, 2010) has questioned whether the wording of the adapted PMCSQ-2 is contextually relevant to dance contexts. Therefore, the first aim of the present study was to examine the content validity of the 33-item PMCSQ-2 (as adapted for dance by Quested & Duda, 2009a) across a variety of dance populations, with the goal of identifying any problematic items, and determining the nature and frequency of such problems experienced by dancers whilst completing the measure. Previous research in dance (Quested & Duda, 2010) has also questioned whether the construct of intra-team rivalry, as defined in AGT and represented in the wordings of the items in the PMCSQ-2, exists in dance settings. Hence, the second aim of this study was to examine whether the sub-dimensions of task- and ego-involving climates captured in the subscales of the PMCSQ-2 are relevant and meaningful in dance contexts.

To achieve the aims of this study, a cognitive interviewing approach known as 'think aloud' (Ericsson & Simon, 1993; Green & Gilhooly, 1996) was employed. The think aloud method requests participants to verbalise all their thoughts overtly, as they complete a

questionnaire (Green & Gilhooly, 1996). The participants are not asked to explain the

reasoning behind their thoughts but just to say aloud what they are thinking about as they

work through the items. Think aloud interviews have been reported as a valid method of

investigating thought processes during a cognitive task (Ericsson & Simon, 1993) and have

been used by a number of researchers to explore difficulties experienced by individuals whilst

completing self-report questionnaires (e.g., Darker & French, 2009; Holland et al., 2010).

Quantitative psychometric assessment may highlight which items are not performing as

intended (capturing the first aim of this study); however, cognitive interview techniques allow

insight into why (addressing the second aim), by exploring participants' cognitive processes

while responding to the items. The 'think aloud' method can be used to identify problems and

enhance wording and construction of instruments, improving the reliability (e.g., by refining

ambiguously worded items) and validity (e.g., by addressing the relevance and clarity of

items; see Knafl et al., 2007) of the measure.


## Method

### Participants

Participants were 21 dancers (10 male, 11 female) from the UK. Dancers ranged from

12-36 years of age ($M_{age}$ = 22.71, $SD$ = 6.34). The inclusion criteria were that dancers

needed to be 10 years and older and be able to verbalise their thoughts.  A heterogeneous

sample was recruited to gain a broad view of the dance population as a whole. Five

classifications of participation were included; recreational non-performance ($N$ = 3; attend

open dance classes but do not take part in any dance performances or exams), recreational

performance ($N$ = 4; attend a private dance school or group and take part in dance exams

and/or performances), academic ($N$ = 3; studying dance at college or university), vocational

($N = 6$; studying dance at a performing arts school or conservatory), and professional ($N = 5$; perform professional work either freelance or for a company on a regular basis). The majority of dancers (81%) reported that they participated/performed in more than one dance style. Dance styles of participants included ballet, contemporary, jazz, tap, street/hip hop, modern, African and tango. Dancers had danced for an average of 12.57 years ($SD = 6.14$, range = 2 - 24) and spent on average 18.08 hours ($SD = 13.89$; range = 2 - 40) dancing per week.

**Design and procedure**

Prior to commencement of the study, ethical approval was gained from the ethics board of a large UK university. Potential participants were given information sheets including written indications that participation was voluntary, that interviews would be audio-recorded and that all data would be kept confidential and any quotes included in analysis would be made anonymous. All participants completed written consent forms before taking part in the study. For dancers less than 16 years of age, parental consent was obtained prior to inviting the dancer to take part. Demographic information (including age, gender, dance styles studied, years of dance experience and hours spent in dance classes each week) was obtained from all participants, via the completion of a short questionnaire.

All interviews were conducted in a quiet room at a convenient location for the participant. The first author read the participant standardised instructions adapted from Green and Gilhooly (1996). The instructions outlined that participants should verbalise their thoughts constantly whilst completing the questionnaire, they should not plan what to say but just act as if they are alone in the room talking to themselves and that there is no right or wrong way to think. Dancers were given a warm up task to familiarise them with the think aloud method. The researcher dealt with any questions at this time. If they did not do so in the warm up, dancers were asked to read the question aloud first before answering. To minimise

influence, the researcher sat out of the line of sight of the participants and remained silent unless the participant stopped talking for longer than 20 seconds, at which stage the researcher asked the participant to 'please keep talking'. The interviews lasted approximately 30 minutes each.

**Materials/Measures**

Dancers completed the 33-item PMCSQ-2 (Newton et al., 2000) adapted for dance (Quested & Duda, 2009a). The stem "In this dance school/company/group..." was used. The PMCSQ-2 has 6 sub-scales: 3 measuring task-involving aspects of the motivational climate; (important role, e.g., "Each dancer has an important role"; cooperative learning, e.g., "Dancers help each other learn" and effort/improvement, e.g., "Dancers feel successful when they improve") and 3 measuring ego-involving features (punishment for mistakes, e.g., "The teachers get mad when a dancer makes a mistake"; intra-team member rivalry, e.g., "The teachers praise dancers only when they outperform other dancers"; and unequal recognition, e.g., "The teachers have their own favourites"). Dancers responded to items on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

**Data Analysis**

Firstly, descriptive statistics, alpha coefficients, and bivariate correlations were calculated using SPSS (version 19). This was done to examine the internal reliability and factor structure of the measure and check that participants responded to the measure in a way comparable to previous research. This approach has also been used in past work (Kaklamanou, Armitage, & Jones, 2013) which employed the think aloud methodology to examine the reliability and validity of the compensatory health beliefs scale.

Secondly, the audio recordings of all interviews were transcribed verbatim and segmented into text relating to each item in the PMCSQ-2. Participants' responses were analysed thematically using QSR NVIVO software (version 10). Following recommendations by Someren, Barnard, and Sandberg (1994), each item segment was individually analysed to identify if the participant experienced any problems in answering. Problems were identified and coded using the integrated model of the components of response categories, as outlined by Holland et al. (2010; see Table 4.1). The processes underlying individuals' item responses are assumed to be multi-dimensional, consisting of a number of component phases (Tourangeau, Rips, & Rasinki, 2000). The integrated model combines all five component phases (understanding, interpretation, retrieval, judgement, & responding) identified by Tourangeau et al. (2000). Any issue that could be categorised into one of the five component phases was considered a 'problem' with completing item.

For every item, each participant's response was individually analysed with the nature and frequency of problems experienced by that participant recorded. The total number of participants experiencing problems with each item was calculated (see Table 4.3, column 3). The subscale with the highest average number of participants experiencing problems per items was reported. As each participant may experience more than one problem per item, the total frequency of problems with each item was calculated (see Table 4.3, column 10). The number of problems per item within each of the component phases (Tourangeau et al., 2000) was also analysed (see Table 4.3, columns 4-9). In addition, the total overall number of problems experienced by dancers whilst completing the measure was also reported.

Table 4.1

*Integrated Model of the Components of Response as Outlined by Holland et al. (2010)*

| Coding Number | Component | Description |
| --- | --- | --- |
| 0 | No problems | The participant does not appear to experience any problems whilst completing the item. |
| 1 | Understanding | The participant has problems comprehending the language used. For example, respondents are unable to read or understand the words and phrases used within the question. This may be due to a difficult grammatical construction or an unfamiliar word or phrase. |
| 2 | Interpretation | The participant has trouble correctly comprehending sentences used in the question. For example they incorrectly interpret the meaning and content of the question as it was originally intended (in line with the construct the item is trying to capture). For example, is the participant clear what the question is actually asking? Do they misinterpret the question or answer a different question to the one which was asked? Is the content of the question relevant? |
| 3 | Retrieval | The participant has problems gathering the necessary information from their memory or value system in order for them to form an appropriate answer. |
| 4 | Judgement | The participant has trouble using the information retrieved from their memory or value system to make a judgement as to what response they will give to the question. |
| 5 | Responding | The participant experiences difficulty with the questionnaire's response format and have trouble selecting an appropriate number on the provided Likert-scale. |
| 6 | Insufficient Thinking Aloud | The participant seems to experience problems when answering the item but does not give enough information to identify the reason. |

*Note.* The integrated model combines all five component phases (understanding, interpretation, retrieval, judgement, & responding) identified by Tourangeau et al. (2000).

Consistent with previous think aloud protocols (e.g., Darker & French, 2009; Kaklamanou et al., 2013), the item response category selected (i.e., agree/disagree) on the questionnaire was considered during analysis of participants' think aloud responses. All transcripts were coded by the main author. To establish trustworthiness of the coding scheme, five think aloud transcripts were selected at random for independent coding by the second author and another trained rater. Responses were compared and discussed and subsequently agreement between coders increased to 100%.

## Results

### Descriptive Statistics and Scale Reliability

Descriptive statistics (displayed in Table 4.2) revealed dancers to generally perceive the teacher-created motivational climate to be more task-involving than ego-involving. All mean scores for task-involving subscales were above the mid-point and all mean scores for ego-involving subscales below the mid-point. Cronbach's alpha coefficients (Cronbach, 1951) were calculated to examine the internal consistency of each subscale and the higher-order task-involving and ego-involving dimensions. Both higher-order scales and all three task-involving subscales demonstrated acceptable internal consistency with Cronbach alpha's > .70. In terms of the ego-involving subscales, the unequal recognition subscale was found to be internally consistent, but the alphas for intra-team member rivalry and punishment for mistakes subscales were considered to be within the lower level of acceptability for established scales with few items (Hair, Black, Babin, Anderson, & Tatham, 2006). Bivariate correlations between the PMCSQ-2 subscales and higher order factors conform to the expected patterns as outlined by Newton et al. (2000), supporting the factor structure of the measure.

Table 4.2

*Descriptive Statistics: Mean, SD, Cronbach's Alpha Coefficient, and Correlations between the PMCSQ-2 Subscales and Second-Order Factors*

| | M | SD | α | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Effort/Improvement | 4.33 | .75 | .86 | | | | | | | |
| 2. Important Role | 4.02 | .80 | .75 | .70** | | | | | | |
| 3. Cooperative Learning | 4.18 | .77 | .72 | .77** | .87** | | | | | |
| 4. Punishment for Mistakes | 2.79 | .78 | .67 | -.27 | -.50** | -.64** | | | | |
| 5. Unequal Recognition | 2.86 | .90 | .85 | -.34 | -.33 | -.42 | .64** | | | |
| 6. Intra-team Member Rivalry | 2.18 | .83 | .67 | -.01 | -.20 | -.28 | .59** | .67** | | |
| 7. Task Climate | 4.43 | .75 | .92 | .91** | .91** | .93** | -.43 | -.37 | -.10 | |
| 8. Ego Climate | 2.72 | .74 | .84 | -.25 | -.41 | -.49* | .86** | .93** | .79** | -.38 |

**Think Aloud Interview Results**

Analysis revealed that out of the 693 responses to the items from participants, the majority (72%) presented no problems. However, no participant completed the whole measure without experiencing any difficulty/confusion. The number of problems per person ranged from 1 to 25 ($M = 8.81$). Problems identified are presented in relation to the five component phases (understanding, interpretation, retrieval, judgement, & responding) of questionnaire response. Interpretation of items was the most frequent problem and understanding the item was the least common problem experienced by the dancers.

Table 4.3 presents the frequency and nature of problems identified by item. The most problematic item was "Dancers are not selected for the best roles if they make mistakes" which resulted in a total of 17 problems experienced by 13 (62 %) of the participants. There was no item that was found to be completely unproblematic. Of all the subscales, intra-team member rivalry was found to have the highest frequency of problems per item, with on average 9 dancers (43%) experiencing problems with items on this subscale.

**Understanding**

Less than 1% of problems identified were due to dancers having difficulty comprehending the language used. Only two participants, both of whom spoke English as a second language, experienced problems with understanding. For example, in response to the item "The teacher praises dancers only when they outperform other dancers" a professional dancer (P23, aged 34) said "When they outperform other dancers. I don't understand this question so I skip [leaves blank]".

Table 4.3

*Number of Participants Experiencing Problems, Types of Problems Identified for the 21 Respondents and Frequency Total Displayed per Item*

| Item | Subscale | Number of participants experiencing problems | Number of problems by component phase of response (coding numbers correspond to those in table 2) | | | | | | Total number of problems |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | |
| 1. Dancers are not selected for the best roles if they make mistakes. | PM | 13 | 0 | 7 | 4 | 2 | 2 | 2 | 17 |
| 2. Dancers are "fired up" (positively excited) when they perform better than their fellow dancers in a performance. | IMR | 13 | 1 | 5 | 0 | 8 | 0 | 2 | 16 |
| 3. Trying hard is rewarded in rehearsals and performances. | EI | 10 | 0 | 8 | 1 | 0 | 1 | 0 | 10 |
| 4. The teachers praise dancers only when they outperform other dancers. | IMR | 8 | 1 | 5 | 0 | 3 | 1 | 1 | 11 |
| 5. If you want to be cast for the best roles you must be one of the best dancers. | PM | 8 | 0 | 7 | 3 | 4 | 0 | 0 | 12 |
| 6. The teachers yell at dancers for messing up. | PM | 8 | 0 | 3 | 2 | 4 | 2 | 0 | 11 |
| 7. Only the top dancers "get noticed" by the teachers. | UR | 8 | 0 | 5 | 0 | 3 | 2 | 0 | 10 |
| 8. Each dancer has an important role. | IR | 8 | 0 | 6 | 1 | 1 | 1 | 1 | 10 |
| 9. Dancers at all skill levels have an important role in performances. | IR | 7 | 0 | 7 | 1 | 1 | 0 | 2 | 11 |
| 10. The teachers believe that all of us are crucial to the success of a performance. | IR | 7 | 1 | 4 | 2 | 1 | 1 | 1 | 10 |
| 11. Each dancer contributes in some important way. | IR | 7 | 0 | 5 | 1 | 0 | 1 | 1 | 8 |
| 12. Dancers are encouraged to outperform the other dancers. | IMR | 7 | 0 | 5 | 0 | 0 | 2 | 1 | 8 |
| 13. The teachers want us to try new skills/movements/expressions. | EI | 7 | 0 | 5 | 0 | 1 | 1 | 1 | 8 |
| 14. Each dancer feels as if they are an important team member. | IR | 6 | 0 | 5 | 1 | 1 | 0 | 0 | 7 |
| 15. Dancers are punished when they make a mistake. | PM | 6 | 0 | 4 | 0 | 1 | 1 | 0 | 6 |

| | | 0 | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|
| 16. Dancers are afraid to make mistakes. | PM | 6 | 0 | 5 | 0 | 0 | 1 | 0 | 6 |
| 17. The dancers really "work together" as a team when it comes to performances. | CL | 6 | 0 | 4 | 1 | 0 | 1 | 0 | 6 |
| 18. Dancers feel good when they try their best. | EI | 5 | 0 | 5 | 0 | 1 | 0 | 0 | 6 |
| 19. The teachers think that only the lead dancers contribute to the success of a performance. | UR | 5 | 0 | 4 | 1 | 1 | 0 | 0 | 6 |
| 20. The teachers get mad when a dancer makes a mistake. | PM | 5 | 0 | 3 | 0 | 1 | 2 | 0 | 6 |
| 21. Only the best dancers get praise. | UR | 5 | 0 | 2 | 0 | 2 | 2 | 1 | 7 |
| 22. The teachers make it clear who they think are the best dancers. | UR | 4 | 0 | 1 | 2 | 1 | 1 | 1 | 6 |
| 23. The focus is to improve each class /rehearsal /performance. | EI | 4 | 1 | 2 | 0 | 1 | 1 | 0 | 5 |
| 24. The dancers help each other to get better and excel. | CL | 4 | 0 | 2 | 1 | 1 | 1 | 0 | 5 |
| 25. The teachers have their own favourites. | UR | 4 | 0 | 1 | 0 | 1 | 2 | 0 | 4 |
| 26. The teachers favour some dancers more than others. | UR | 4 | 0 | 2 | 0 | 2 | 0 | 0 | 4 |
| 27. The teachers emphasise always trying your best. | EI | 4 | 0 | 3 | 0 | 0 | 1 | 0 | 4 |
| 28. The teachers make sure dancers improve on skills or movements they're not good at. | EI | 3 | 0 | 1 | 0 | 2 | 1 | 0 | 4 |
| 29. Dancers are encouraged to work on their weaknesses. | EI | 3 | 0 | 2 | 0 | 0 | 1 | 0 | 3 |
| 30. The teachers give most of their attention to the "stars". | UR | 3 | 0 | 1 | 0 | 2 | 0 | 0 | 3 |
| 31. Dancers help each other learn. | CL | 2 | 0 | 0 | 0 | 0 | 1 | 1 | 2 |
| 32. The teachers encourage dancers to help each other. | CL | 1 | 0 | 0 | 1 | 1 | 1 | 0 | 3 |
| 33. Dancers feel successful when they improve. | EI | 1 | 0 | 0 | 0 | 1 | 1 | 0 | 2 |
| TOTAL | | | 4 | 119 | 22 | 47 | 32 | 15 | 239 |

*Note.* CL = Co-operative Learning, IR = Important Role, EI = Effort/Improvement, PM = Punishment for Mistakes, UR = Unequal Recognition, IMR = Intra-team Member Rivalry. Coding numbers correspond to those in table 4.1 (0 = No problems, 1 = Understanding, 2 = Interpretation, 3 = Retrieval, 4 = Judgement, 5 = Responding, 6 = Insufficient Thinking Aloud).

**Interpretation**

Half of all problems identified (50%) were related to the misinterpretation of items. Many dancers ($n = 13$) had trouble interpreting items in relation to the general motivational climate operating in their dance school, company or group, as instructed in the stem. The most problematic item, with 6 dancers not interpreting it in relation to their current dance context was "If you want to be cast for the best roles you must be one of the best dancers". Four participants interpreted this item in relation to other dance contexts in which they had trained or worked. Other items (items 1, 6, & 9 in Table 2.3) were also appraised in relation to other contexts by some ($n = 3$) dancers. For example, a recreational non-performance dancer, interpreted the item "Dancers at all skill levels have an important role in performances" in relation to her experiences from when she was younger and in a different dance context to her present setting: "Yes definitely, I mean, when I used to dance in a school when I was really young…..I was like four or something and I still had something to do [Agree]" (P17, recreational non-performance, aged 20).

Some dancers ($n = 6$) also expressed their own opinions and values, rather than reflecting on those facets of the climate emphasised by the teacher-created climate. For example, in response to the item "Dancers feel good when they try their best" a dancer (P1, recreational performance, aged 27 years) said "Do you mean in terms of myself, so I would feel good when I try my best, or erm the teacher makes us feel good when we try our best? OK so erm, I'm going to take it that that means, based on me." A few dancers ($n = 2$) interpreted the items in relation to their own teaching practices rather than that of the climate in which they participate as a dancer; "…when I am teaching it doesn't matter how technical you are. It doesn't matter how good you are in the studio. You always give attention to the

student who trying to be their best. So yes the teachers always emphasise trying your best. I think that's a good thing and that yes, I agree [Agree]" (P23, professional, aged 34).

Dancers also experienced problems with the interpretation of certain words and phrases, such as, 'important role' ($n = 6$), 'rewarded' ($n = 6$), 'best dancers' ($n = 5$), and 'mistakes' ($n = 3$).

**Important Role.** Six dancers had trouble with the interpretation of the construct of important role in dance contexts. For example, one dancer said "So...erm...so I'm wondering what do you mean with important role, for what?  For the ensemble or for... so um I guess for the group dynamic?" (P15, academic). The items of the important role subscale seem to lack discriminant validity as quite a few ($n = 5$) of the dancers' responses were more related to the construct of co-operative learning than to that of every dancer having an important role. For example, in response to the item "Each dance contributes in some important way" a professional dancer (P27, aged 26) responded "Yes definitely. Everyone helps everyone. Everyone learns from everyone [Strongly Agree]."

**Rewarded.** Six dancers had problems interpreting the item "Trying hard is rewarded in rehearsals and performances." Two dancers questioned the meaning and context surrounding the term rewarded: "Erm I wonder rewarded in which way?" (P15, academic, aged 24). Three of the dancers referred to providing themselves with reward rather than being rewarded by the climate that they were operating in. For example one dancer said "Erm, I think that the reward comes from yourself. So, you end up feeling good [Agree]" (P1, recreational performance, aged 27). A young vocational dancer (P33, aged 12) interprets the item in relation to the long-term extrinsic rewards associated with effort and improvement in a professional dance career "I strongly agree with that one as then, if you are in the cours de ballet you may be offered a soloist job if you try your best everyday" [Strongly Agree]. While

potentially relevant to a task-involving climate, both these items highlight that the dancers were not judging their responses based on whether the dance school specifically encourages effort and improvement, as the item intends.

**Best Dancers.** Six dancers had trouble with the interpretation the 'best' or 'top' dancers. For example, in response to an item from the punishment for mistakes subscale ("If you want to be cast for the best roles you must be one of the best dancers"), a vocational dancer questioned, "What is the best dancer? Every piece or performance suits someone different.  Er so you might be the best technician but not necessarily the best suited to a particular piece or casting. Um ye... I'll put that in the middle [Neutral]" (P9, vocational, aged 23). Another dancer in response to the unequal recognition item, "Only the best dancers get praise" said "Erm... I think, best, the best dancer is not really um the right way of describing, because what is the best dancer? What, what defines a good dancer anyway? So this question is strange. Erm… but yes dancers that seem to be serious about their work, whatever it is, they get um acknowledged and recognised I guess. Erm… but I refuse to answer this question as I don't know what you mean with best dancer [left blank]" (P15, academic, aged 24). One dancer interpreted 'best dancers' to mean those that try the hardest. For example, in response to the item "Only the best dancers get praise," a young vocational dancer (P31, aged 12) said "Erm…they when they um do really, really well like noticeably well then the teacher will give you loads of praise because she's happy that you've worked hard and got better. Um 4 [Agree]." The item "Only the best dancers get praise" is intended to tap the construct of unequal recognition, a dimension of ego-involving climates. However, in the above example the young dancer appears to misinterpret the item to capture the concept of effort and improvement which is relevant to task-involving climates.

**Mistakes.** Three participants had trouble interpreting the purpose of the use of the word 'mistakes' within the item context due to multiple possible meanings. For example, in response to the item "Dancers are afraid to make mistakes," a vocational dancer thought aloud "Erm…to make mistakes I think… I don't understand so much err… er making mistakes. Does it mean like physical or does it mean er like general like… I'm not sure [Agree]" (P19, vocational, aged 22). The same dancer when answering the item "Dancers are not selected for the best roles if they make mistakes" explained "…well in a dance school environment you can make loads of mistakes. You can like make mistakes by not turning up every day. But the people that didn't turn up every day still managed to get the roles so… kind of…erm kind of doesn't apply really like…no so I would disagree with that one [Strongly Disagree]".

**Retrieval**

Nine percent of problems were due to dancers having trouble gathering the necessary information from their memory or value system in order for them to form an appropriate answer. The majority (64%) of issues with retrieval were experienced by recreational non-performance and performance dancers. For these dancers, problems with retrieval appeared to be mainly due to a lack of experience in dance performance contexts. For example, three dancers had trouble retrieving an appropriate memory when answering the item "If you want to be cast for the best roles you must be one of the best dancers" as they had not experienced being cast for roles in their dance school/company/group. For example, one dancer stated "If that's a question about my dancing now, we aren't necessarily being cast for any roles. Oh. I don't know. Oh well [Strongly Agree]" (P3, recreational performance, aged 23).

**Judgement**

Nineteen percent of problems were due to participants having trouble using the information retrieved from their memory or value system to make a judgement as to what

response to give. The most problematic item in in terms of judgement was "Dancers are "fired up" (positively excited) when they perform better than their fellow dancers in a performance". Three dancers struggled to make a judgement due to the varied nature of performance in dance. For example, a young vocational dancer (P33, aged 12) said "I think that one's neutral as it all depends what sort of performance you are in really [Neutral]". Another dancer explained "If you are solo you don't compete with anybody. So, dancers get fired, fired up when they perform better in classes than the other ones yes you get a little 'yes I'm doing good', but not in performances, so I would say that I don't have an answer to that question so that's a 3 [Neutral]" (P29, vocational, aged 22). Three dancers experienced trouble making a judgment about whether they outperformed other dancers because of not being able to see their fellow dancers perform. For example, one dancer stated, "normally you wouldn't know [be]cause you're on stage at the same time" (P9, vocational, aged 23) and another dance also commented "you aren't able to kind of see the other person's technique to be able to be excited, fired up [Neutral]" (P5, recreational performance, aged 19). Two recreational non-performance dancers had trouble making a judgement as they felt that the context of the question was not relevant for them. For example, one of the dancers thought aloud "I mean, I don't perform so it's hard to say, but I'm sure it's a bit of a team effort. So a bit neutral on that one [Neutral]" (P17, recreational non-performance, aged 20).

**Responding**

Thirteen percent of problems were due to participants experiencing difficulty with the questionnaire's response format and not selecting an appropriate number on the provided Likert-scale. Sixty-six percent of the problems in responding were encountered by one particular dancer. His choice of category on the Likert scale did not match up with what he verbalised for 22 of the items. For example, in response to the item "Dancers are not selected

for the best roles if they make mistakes" he said "So I will put strongly agree" but selected strongly disagree on the questionnaire. A few (*n* = 4) other dancers' choice of response category also did not match up with what they thought aloud. Four dancers found the response categories to be restricting with three participants selecting both Neutral and Agree and another dancer thinking aloud "I would like to say 3 and a half but as I cannot say it then, let's just say 3 [Neutral]" (P29, vocational aged 22).

## Discussion

Employing a 'think aloud' methodology (Ericsson & Simon, 1993; Green & Gilhooly, 1996), the current study aimed to examine the content validity of the 33-item PMCSQ-2 (as adapted for dance by Quested & Duda, 2009) across a variety of dance populations. Specifically, the focus was to identify any problematic items, and the nature and frequency of such problems experienced by dancers whilst completing the measure. Think aloud interviews revealed 72% of the participant responses to the items presented no problems, indicating the measure to have a degree of content validity. However, in the case of 28% of item responses, problems were encountered in relation to at least one of the five component phases (understanding, interpretation, retrieval, judgement, & responding) identified by Tourangeau et al. (2000).

The second aim of the study was to examine whether the sub-dimensions of task- and ego-involving climates captured in the subscales of the PMCSQ-2 are meaningful and relevant in dance contexts. Overall, the results supported the relevance of the sub-dimensions. However, the wording of some of the items may not be appropriate for capturing key constructs (e.g., intra-team member rivalry) as construed in dance contexts. Although this study focused specifically on the use of the PMCSQ-2 in dance settings, only a small

percentage (5%) of the problems identified were purely dance specific. This is encouraging in terms of the potential utility of sport-based measures in dance or at least this particular sport-reference instrument.

**Relevance of Questions**

The main problem experienced by participants whilst completing the measure was the misinterpretation of items. Many participants interpreted items in relation to their own opinions or their experiences in or views regarding the status quo in other settings. In the case of the PMCSQ-2, this was not appropriate as the questionnaire items were specifically intended to provide an assessment of the general motivational climate currently operating in their dance school, company or group (i.e., the focus of the stem). This misinterpretation of items occurred despite instructions being provided and the stem being repeated at the top of each page. The stem asked participants to respond in relation to their dance school/company/group. In order to examine relations between individuals' perceptions of the motivational climate in which they participate and variables of interest to researchers concerned with motivational processes in dance, it is of critical importance that participants interpret questions in relation to the particular context being examined. Otherwise, the assessments taken and subsequent results of such studies are compromised. One way to address this problem is to repeat the stem in each item. For example, in the original PMCSQ-2 (Newton et al., 2000), each item starts with "On this team", reinforcing the context in question. However, previous research that employed a think aloud method to assess usability and validity of a theory of planned behaviour questionnaire (Darker & French, 2009) revealed participants were irritated by repetition of a stem within each item. Hence, future studies employing the PMCSQ-2 in dance contexts may want to consider an alternative way to combat this issue, for example, repeating the stem "In this dance school/company/group"

(deleting appropriately depending upon the dance context) at regular intervals (e.g., every five items). Other ways in which the stem could be made more prominent include emboldening, highlighting, and/or the importance of the stem being regularly stressed by the research assistant when administering the questionnaire.

For some of the dancers, the misinterpretation of items was due to the content of the question not being relevant for them. The PMCSQ-2 was originally designed for use in competitive team sports settings and then re-worded by Quested and Duda (2009a) for elite and vocational dance contexts. For example, in their revision, the word "game" was replaced with "performance" as taking part in performances is an integral part of elite and vocational dancers training. Hence, the PMCSQ-2 (adapted for dance) contains nine performance related items. It is important to note, however, that dance is a diverse activity that can be individualistic and/or group/team based, competitive and/or non-competitive. Furthermore, the occurrence and nature of performances vary depending upon the context in which they take place. The findings of this study revealed recreational non-performance dancers to have trouble interpreting items related to performance within their context of interest and they also experienced problems retrieving relevant memories. Instead they tended to answer in relation to past performance experiences in other dance contexts or what they believe might happen when dancers do perform. Based on the findings of this study, it would seem that the performance-related items (e.g., "Dancers at all skill levels have an important role in performances") are not relevant or appropriate for community, social, or recreational dance groups/classes where public performance is not an integral focus. One possible solution to this issue for six of the items that refer to performances (items 2, 3, 9, 10, 17, 23 in Table 4.3) could be to remove the reference to rehearsals and performances and capture the relevant feature of the environment without contextualising it within performance. For example,

"Trying hard is rewarded in rehearsals and performances" could simply read "Trying hard is rewarded". However, three of the items that refer to performance (items 1, 5 & 19 in Table 4.3; e.g., "If you want to be cast for the best roles you must be one of the best dancers") can only be contextualised in performance-focused dance contexts and it may not be possible to alter these to be suitable for all dance environments. For example, in community, social, or recreational dance settings, dancers are not cast for roles within the group/class. Therefore, these three performance-related items could be omitted when employing the measure in such non-performance dance contexts.

It is important to note that the results of previous research (Norfield & Nordin-Bates, 2012) employing the PMCSQ-2 (adapted for dance) with community dancers should be interpreted with caution as the dancers may not have all engaged in performances, and thus, may have struggled with these particular items. Furthermore, researchers adapting the PMCSQ-2 for use in other contexts (e.g., Huddleston, Fry, & Brown, 2012) which are not always competitive and/or team-based in nature (i.e., exercise, physical activity, individual sports) should consider the relevance of items, in particular the items contextualised within team game/performance situations.

**Capturing Constructs**

Dancers experienced problems with regards to interpreting certain terms such as 'reward', 'important role', 'mistake', and the 'best' or 'top' dancers. This may be due to 'vague concepts' (Tourangeau et al. 2000, p.45) which could have multiple meanings. For example, the wording of some of the items from the unequal recognition (e.g., "Only the best dancers get praise") and punishment for mistakes (e.g., "If you want to be cast for the best roles you must be one of the best dancers") subscales leaves the interpretation of what constitutes the 'best' dancer up to the respondent. In this study, the ambiguity of the term led

to six dancers not being clear what the question was asking, with one dancer refusing to answer the question as a result of not knowing what criterion to use to interpret 'best dancer'. The measure is assessing dancers' perceptions of the teacher-created motivational climate, hence, it is the dancers' perceptions of who the teacher favours or considers to be the 'best' dancer that is of interest. Thus, it could be argued that it does not matter how the dancer interprets 'best' dancer as long as the criterion is one which the teacher could use to create a hierarchy of unequal recognition. For example, one dancer interpreted the 'best' dancer from the item "Only the best dancers get praise" to mean those that tried the hardest. The ambiguity of the term could lead to the item being misinterpreted to capture the construct of effort and improvement as opposed to unequal recognition based on ability differences. However, if the teacher still creates a hierarchy based on effort (or whatever criterion the dancer uses to interpret 'best' dancer) then issues of unequal recognition could still be present. In this case, the participant's thoughts articulated out loud did not make clear as to whether the dancer felt that the teacher created a hierarchy based on effort. Follow-up questions (probes) from the interviewer could have clarified the respondent's interpretation of the item. Thus, future research using the think aloud method should consider the use of scripted or unscripted probes (Beatty & Willis, 2007).

In the current study, a number of items from the important role subscale appeared to lack conceptual clarity. For example, quite a few ($n = 5$) dancers' responses were related to the construct of co-operative learning, rather than capturing the extent to which dancers' feel important and that their contribution is valued within their group. This finding is in line with previous research undertaken with vocational dancers (Quested & Duda, 2010) which report the item "Each dancer feels as if he/she is an important team member" to be problematic, as it loaded poorly onto the important role factor and cross-loaded with co-operative learning.

Hence, examination of what is it about the nature of the constructs and the wording of items within the important role and co-operative learning subscales that is leading to this cross-loading is necessary.

**Intra-team Member Rivalry**

The results revealed the intra-team member rivalry subscale to be the most problematic subscale in terms of frequency of problems per participant. The item "Dancers are 'fired up' (positively excited) when they perform better than their fellow dancers in a performance" from the intra-team member rivalry subscale was found to be particularly challenging. It appeared from the think aloud data that participants struggled with making a judgement as to what response to give to the item due to the varied and subjective nature of dance performance. For example, a young vocational dancer stated "it all depends what sort of performance you are in really". Responses given by dancers indicated that in some dance contexts (e.g., a solo performance), there may not be any fellow dancers to compare their performance against. Also, in group performances, dancers may not be able to see their fellow dancers due to being off stage or in a different section of the performance, whereas, in team sport contexts players are all visible to each other during a game. Furthermore, in sport contexts, athletes are given a score (whether objective or subjective) that can be used to compare performance against others. However, in most dance contexts (the exception being dance competitions), scores are not given. Hence, although not uncovered in the think aloud interviews in this study, it could be speculated that the lack of performance 'stats' may contribute towards dancers' finding it hard to and make a judgement as to whether or not they have performed better than their fellow dancers.

Previous research with vocational dancers (Quested & Duda, 2010) report that the item "Dancers are "fired up" (positively excited) when they perform better than their fellow

dancers in a performance" and another item from the intra-team rivalry subscale "Dancers are encouraged to outperform the other dancers" cross-load onto other factors. The findings of the current study support Quested and Duda's (2010) proposition that these cross-loadings may be attributable to dancers having trouble identifying when they outperform other dancers. However, this does not mean that the construct of intra-team rivalry is less relevant or meaningful in dance contexts. For example, in the present study a recreational performance dancer articulated out loud that they get 'fired up' when they perform better than their fellow dancers "in class, but not in performance" (P3, recreational performance dancers, aged 23). Thus, rivalry between members of the same dance group may occur if teachers encourage dancers to compare themselves against others within class. In response to the item "Dancers are encouraged to outperform other dancers" a vocational dancer (P37, aged 16) said "Erm ye I guess we are because in auditions and stuff you have to stand out and you have to otherwise you won't get anywhere you have to be better than the others basically [Strongly Agree]." Hence, rivalry or interpersonal comparison with dancers from other groups or schools may occur if dancers are competing in an audition for the top roles/jobs in a production/company. Thus, it may be that the wordings of the items in the PMCSQ-2 do not accurately capture the construct of rivalry/interpersonal comparison in dance settings. Future research employing focus groups with dancers to explore what words or phrases, if any, are used in dance contexts to refer to rivalry or interpersonal comparison between dancers. The focus groups could also explore when dancers may feel a sense of rivalry and under what sort of circumstances (i.e., does the occurrence of rivalry differ between class, rehearsal, audition, and performance contexts?). Furthermore, it would be interesting to explore what criterion dancers use for normative comparison (e.g., most artistic/expressive, most athletic, most technical). Findings of the focus groups may aid the generation of alternative wording that may be more

appropriate for capturing the construct of intra-team member rivalry/interpersonal comparison in dance contexts.

The findings of this study could also lead us to speculate about the content validity of the PMCSQ-2 intra-team member rivalry items with athletes. Past research in sport contexts (Appleton, Ntoumanis, Quested, & Duda, 2013; Newton et al., 2000; Vazou et al., 2006) has reported the intra-team rivalry subscale to be problematic in terms of internal consistency. The PMCSQ-2 has also more recently been adapted for other non-sport settings, such as physical education classes (e.g., González-Cutre, Scicilia, Moreno, & Fernandez-Balboa, 2009) and exercise contexts (Huddleston, Fry, & Brown, 2012). González-Cutre et al., (2009) also report the intragroup member rivalry subscale to have poor internal consistency in physical education contexts with a Cronbach's alpha co-efficient of .61. Thus, future research investigating how rivalry is manifested in the different achievement contexts and whether the intra-team rivalry items in the PMCSQ-2 fully capture this construct as it is construed within sport, physical education, exercise, and dance contexts would be valuable.

**Limitations and Future Directions**

Although thematic analysis is useful for identifying problems experienced by individuals whilst completing a questionnaire, caution should be exercised in deciding the importance of problems based merely on the frequency of occurrence (Braun & Clarke, 2006). A heterogeneous sample was recruited to reflect the fact that the PMCSQ-2 (adapted for dance) has been employed with dancers from a variety of dance settings. Although a total of 15-25 participants is considered to be sufficient (Willis, 2005), the results are limited by small sample sizes within each classification of participation. Research with larger sample sizes within each dance setting would need to be conducted before robust conclusions about the content validity of the PMCSQ-2 with different populations of dancers can be reached.

Furthermore, quantitative examination of the factor structure and invariance of the PMCSQ-2 with different dance populations would be highly valuable.

**Conclusion**

In conclusion, this is the first study to employ a 'think aloud' methodology to examine the appropriateness of any dance psychology related measure. Examination of the content validity of measures is particularly important when the measures of interest were originally developed for use in other contexts (i.e., the PMCSQ-2). The results revealed the majority of participant responses to present no problems when completing items, indicating the measure to demonstrate a degree of content validity when employed with dancers. A small percentage (5%) of problems identified were dance specific. Thus, the results highlighted some limitations of employing measures which were originally designed for use in a different context, as not all items may easily translate to another setting. For example, some dancers experienced problems with interpretation and judgement as to what response to give due to the varied nature of performance in dance and the variety of criterion on which to judge performance. However, overall this study generally supports the potential utility of employing this particular sport-reference instrument in dance contexts.

The majority of problems identified were not dance specific and highlight important issues for researchers to consider when designing and using self-report questionnaires. Based on the findings of this study it is recommended that in future, researchers employing questionnaire methodologies should ensure the relevance of questions, clearly (and repeatedly) specify the context of interest, and avoid use of ambiguous terminology. Findings also have wider implications of the use of the PMCSQ-2, in particular the relevance and ability of the intra-team rivalry items to accurately capture the construct as it is construed within sport, exercise, physical education, and dance contexts. In order to be able to validly

and reliably examine the relationships between the motivational climate and individuals'

optimal functioning, development, and well-being in future research it is vital that any

problems experienced by participants whilst completing the measure are reduced. Thus, future

research determining the severity of problems identified and how they might be resolved

would be of value.

**Teacher-created social environment, basic psychological need satisfaction/thwarting,**

**and dancers' affective states during class: A diary study approach**

**Abstract**

Objectives: Building on previous research grounded in Basic Psychological Needs Theory (BPNT; Deci & Ryan, 2000) and pulling from Duda's (2013) conceptualisation of the multi-dimensional motivational climate, the study had two aims: (1) to examine whether dancers' perceptions of empowering and disempowering teacher climates in dance class predict changes in dancers' affective states during class, and (2) to examine whether dancers' experiences of basic need satisfaction and need thwarting in class mediate the relationships between dancers' perceptions of empowering and disempowering teacher climates and changes in affective states during class.

Method: Three hundred and thirty-nine vocational dancers completed self-report measures before (affective states) and after (affective states, teacher climate, basic need satisfaction and need thwarting) their first and last dance technique class each day for 5 consecutive days.

Results: Multivariate Multilevel Modelling (MVML) analyses revealed basic need satisfaction to mediate the relationship between dancers' perceptions of empowering climates experienced in class and dancers' changes in positive affect during class. Basic need thwarting mediated the relationship between disempowering class climates and changes in dancers' negative affect during class.

Discussion: Findings support the tenets of BPNT at the inter-individual level, advancing current understanding of the social-psychological mechanisms that may underpin dancers' optimal and compromised functioning within vocational dance classes.

*Keywords:* Teacher motivational climate, Dance class, Empowering, Disempowering, Basic Psychological needs, Affective states

Changes in affective (emotional/mood) states can be a part of students' everyday life. The extent to which affective states vary above and below a person's typical level is considered an essential component of subjective well-being (Diener, 2000). Furthermore, students' affective or mood states have been found to be related to quality of learning and achievement in education contexts (Bryan, Mathur, & Sullivan, 1996; Pekrun, Elliot, & Maier, 2009; Villavicencio & Bernardo, 2013). Vocational dance students in particular have been identified as a group with a high prevalence of emotional problems (Laws, 2005). Hence, the examination of the determinants of dancers' changes in positive and negative affect is a worthy pursuit.

Contemporary theories of motivation, namely achievement goal theory (AGT; Ames, 1992; Nicholls, 1989) and self-determination theory (SDT; Deci & Ryan, 1985, 2000) have focused on the role of significant others, such as the teacher, in creating a social-environment that is conducive to the enhancement of individuals' optimal engagement and psychological well-being. The majority of past studies in sport (e.g., Reinboth et al., 2004), physical education (e.g., Ntoumanis, 2005), and dance (e.g., Quested & Duda, 2010) contexts have employed cross-sectional designs, which are limited by their ability to only capture a snap shot in time. Furthermore, these studies have tended to examine whether social-environmental factors predict variation between individuals in terms of certain affective, behavioural, and/or cognitive outcomes (between-person variability). Less research (e.g., Bartholomew et al., 2011a; Gagne et al., 2003; Quested et al., 2013) has explored the social-environmental factors that may underlie variation in reported indices of well- and ill-being that occur within a person over time (within-person variability). Examination of within-person variation can determine the antecedents and consequences of individuals' dynamic experiences, such as

fluctuations in affective states. Furthermore, within-person analyses reduce errors associated with between-person confounds, such as, the effect of individual differences.

Recent research grounded in SDT, in sport (Bartholomew et al., 2011a) and dance (Quested et al., 2013) contexts, have highlighted certain features of the coach/teacher-created motivational climate to independently predict within-person variation in athletes'/dancers' positive and negative affective states during training/class. The present study extends prior research on the social-environmental factors predicting within-person variation in students' affective states by adopting Duda's (2013) approach, consolidating the prominent social-environmental dimensions emphasised in AGT and SDT. Furthermore, this study aims to examine the processes via which the teacher-created social-environment may account for changes in dancers' affective states during class.

**Theoretical Underpinnings**

Duda (2013) proposed a framework that allows theoretical integration regarding key concepts within AGT and SDT, consolidating the prominent social-environmental dimensions and the mechanisms via which significant others (e.g., teachers) may impact individuals' experiences. Duda (2013) posits that the motivational climate can be more or less 'empowering' and/or 'disempowering' depending on which social-environmental characteristics are emphasised. Empowering climates are more autonomy supportive (teachers provide rationale, promote meaningful choice, and solicit input; Mageau & Vallerand, 2003), task-involving (teachers positively reinforce student development, encourage co-operation, and emphasise self-referenced competence; Ames, 1992; Newton et al., 2000), and socially supportive (teachers value their students as individuals, not just as students; Reinboth et al., 2004; Sarason et al., 1987). Whereas, disempowering climates are more controlling (teachers exhibit coercive behaviours, and intimate and pressurise students into behaving and thinking

in certain ways; Bartholomew et al., 2010) and highly ego-involving (teachers may punish

mistakes, give unequal recognition, and encourage normative comparisons of ability (Ames,

1992; Newton et al., 2000).

SDT (Deci & Ryan, 1985, 2000) proposed that particular aspects of the teacher-

created social environment (i.e., autonomy support, social support, and control) influence

individuals' affective, cognitive, and behavioural outcomes via the satisfaction and/or

thwarting of three basic psychological needs. Basic Psychological Needs Theory (BPNT;

Deci & Ryan, 2000), a mini-theory of SDT, posits that three innate psychological needs exist

which are essential for optimal functioning and well-being; namely, the need for autonomy

(feeling that behaviours are self-initiated and volitional), competence (feeling capable of

meeting environmental demands), and relatedness (feeling meaningfully connected and cared

for by significant others; Deci & Ryan, 2000; Ryan & Deci, 2000a, 2000b). Satisfaction of the

basic needs predicts more autonomous motivations and positive affective, cognitive, and

behavioural outcomes (Ryan & Deci, 2000a, 2000b).

Basic psychological need thwarting is when individuals perceive their needs to be

actively obstructed or undermined (Bartholomew et al., 2011a). BPNT holds that the

thwarting of the basic needs is associated with more controlled behavioural engagement and

maladaptive outcomes (i.e., disordered eating, burnout, depression, negative affect;

Bartholomew et al., 2011a; Bartholomew et al., 2011b; Ryan & Deci, 2000a, 2000b). A

critical component of Deci and Ryan's (2000) BPNT is that the basic needs are proposed to

mediate the relationship between social-environmental factors and individual's subjective

well-being and/or experienced ill-being.

**Empowering Climates, Basic Need Satisfaction and Affective States**

Features of the motivational climate considered as empowering (i.e., autonomy support, social support, and task-involving) have previously (at the between-person level) been independently found to predict basic psychological need satisfaction and, in turn, indices of well-being in sport (e.g., Reinboth et al., 2004), physical education (e.g., Ntoumanis, 2005), and dance (e.g., Quested & Duda, 2010) contexts. Hence, a teacher-created climate which is more empowering is proposed to promote individuals' optimal engagement and psychological well-being via the satisfaction of the three basic psychological needs (Duda, 2013). The only feature of an empowering climate that has been examined at the within-person level is teacher autonomy support (Bartholomew et al., 2011a; Quested et al., 2013). Both Bartholomew et al. (2011a) and Quested and colleagues (2013) found coach/teacher autonomy support provided in training/class to independently predict athletes'/dancers' basic need satisfaction and, changes in positive affect during training/class. To date, only one study (Quested, 2010) has specifically examined the mediating role of basic need satisfaction at the within-person level. Quested (2010) found relatedness and competence satisfaction to mediate the relationship between dancers' perceptions of autonomy support in class and changes in positive affect realised during the class.

A limitation of previous research (Quested, 2010; Quested et al., 2013) examining within-person variation in social-environmental predictors of dancers' affective states during class is that the researchers neglected to consider the 'darker side' of dance (i.e., dancers' perceptions of disempowering facets of the motivational climate and basic need thwarting). Measuring disempowering aspects of the teacher-created climate during class and reported experiences of active frustration of the basic needs should facilitate predication of, and explain more variance in, maladaptive outcomes (i.e., changes in dancers' negative affect during class).

**Disempowering Climates, Basic Need Thwarting and Affective States**

Duda (2013) posits that a disempowering teacher created climate will be predictive of maladaptive psychological functioning via the thwarting of the basic psychological needs. The only disempowering feature of the climate to be investigated within the context of sport at the within-person level is coaches' controlling behaviours. Bartholomew et al. (2011a) reported coach controlling behaviours to positively predict athletes' basic need thwarting (as opposed to need satisfaction) during training and, in turn, predict changes in athletes' negative affect pre- to post-training. A limitation of Bartholomew and colleagues (2011a) study, however, is that they did not test the theoretically assumed mediating role of athletes' basic need satisfaction and/or thwarting in the social-environment to affective states relationship.

Hence, the current study will build on previous research with dancers (Quested, 2010; Quested et al., 2013) and athletes (Bartholomew et al., 2011a; Gagne et al., 2003) firstly, by drawing from Duda's (2013) more comprehensive, multi-dimensional conceptualisation of the motivational climate (i.e., considering both empowering and disempowering features which are emphasised within AGT and SDT). Secondly, extending past work, the relationships between dancers' perceptions of empowering and disempowering teacher-created climates and changes in affective states at the within-person level will be examined. Further, and also at the within-person level, this study will test whether dancers' basic need satisfaction and thwarting mediates the relationships between perceptions of the motivational climate and changes' in affective states during class.

**Summary, Aims and Hypothesis**

In the current research, a diary methodology was adopted to examine whether the teacher-created climate during class, predicts within-person changes in students' affective states during class, and the psychological processes via which this may occur. Diaries were

chosen as this method can capture individuals' dynamic experiences and emotional states in the natural context in which they occurred. Furthermore, diary studies minimise bias from retrospective accounts of thoughts, feelings and occurrences, typically problematic with traditional cross-sectional questionnaire methodologies (Bolger, Davis, & Rafaeli, 2003; Reis & Gable, 2000).

The present study aimed to firstly, examine whether dancers' perceptions of empowering (i.e., autonomy supportive, task-involving, and social supportive) and disempowering (i.e., controlling and ego-involving) climates in dance class predict changes in dancers' affective states during class. It was hypothesised that dancers' perceptions of an empowering teacher climate in class would positively predict changes in dancers' positive affect during class. Dancers' perceptions of a disempowering teacher climate was proposed to positively predict changes in dancers' negative affect during class.

Secondly, this study tested whether dancers' basic psychological need satisfaction/thwarting in class mediated the relationships between dancers' perceptions of the teacher created climate in class and changes in affective states during class. It was hypothesised that dancers' basic need satisfaction would mediate the relationship between dancers' perceptions of an empowering teacher climate in class and changes in positive affect during class. Dancers' basic psychological need thwarting was expected to mediate the relationship between dancers' perceptions of a disempowering teacher climate in class and changes in negative affect during class.

**Method**

**Participants and Procedure**

Three hundred and thirty-nine dancers (99 male, 239 female, 1 gender unspecified, *M*age = 15.59, *SD* = 2.27) were recruited from four different full-time vocational dance

schools within the UK. Vocational dancers train for approximately 9 hours a day 5-6 days a week. During a typical day vocational dancers will attend a variety of classes in various genres taught by different teachers. The dancers had been at the school for an average of 2.38 years ($SD = 2.05$) and had been dancing, on average, since they were 4.97 years old ($SD = 2.95$).

Ethical approval was gained prior to commencement of the study. With authorisation from the appropriate dance school personnel, dancers were given information letters informing them as to the nature of the study and what their potential participation would involve. A researcher explained to the dancers that participation was voluntary and that their anonymity would be maintained. Written informed consent was gained from all dancers who were willing to participate. For dance schools with pupils less than 16 years of age, parental consent was gained prior to the dancers being given information letters.

All consenting dancers completed an initial questionnaire measuring demographic information (i.e., age, gender, years of dance experience, and years at current school), under the supervision of a trained researcher. Within one week following the administration of the initial questionnaire dancers were given a diary booklet. Dancers were asked to complete the diary booklet before and after their first and last dance technique class each day for 5 consecutive days (Monday to Friday). At the end of the week, dancers were asked to either place their completed diary in a secure 'drop box' or hand it directly to the primary researcher.

Out of the 339 dancers given a diary, 135 dancers (21 male, 110 female, 4 gender unspecified, $M_{age} = 15.57$ years, $SD = 2.48$) handed in a completed diary. Diary entries completed for classes other than the 5 most popular dance genres (Ballet, Jazz, Contemporary, Choreography and Modern) were excluded from analyses. Of the 135 completed diaries, 13

were excluded due to being deemed to have an insufficient number of completed class entries (< 5). The final sample consisted of 122 dancers and a total of 1071 completed class entries. The number of class entries per participant ranged from 5-10, with a mode of 7.

**Measures**

The diaries consisted of items from validated questionnaires measuring individuals' perceptions of the teacher-created climate, basic need satisfaction and thwarting, and affective states. Dancers were asked to record the time, date and genre of each class for which they completed a diary entry.

**Empowering and Disempowering Teacher Climates.** Immediately post-class, dancers' perceptions of the teacher created-climate in the class that they had just attended was assessed using items selected from the multi-dimensional measure of the motivational climate (MMCSQ; Appleton, Ntoumanis, Quested, & Duda, 2013). Items were chosen based on their strong content validity and/or factor loadings in previous research with dancers (e.g., study 2, study 3, Quested & Duda, 2009a, 2009b, 2010). The MMCSQ includes 3 subscales tapping the empowering dimensions of the climate which draw from previously validated measures. For the diaries, one item was selected to assess autonomy support ("My teacher gave dancers choices and options"; Williams et al., 1996), one to tap task-involving features ("My teacher acknowledged dancers who tried hard"; Newton et al., 2000), and one to measure social support ("My teacher listened openly and did not judge dancers' personal feelings"; Sarason, et al., 1987). The MMCSQ includes two subscales tapping dimensions of disempowering climates. One item from each of these subscales was utilised to tap teacher control (e.g., "My teacher shouted at dancers in front of others to make them do certain things"; Bartholomew et al., 2010) and ego-involving climates ("My teacher had his or her favourite dancers"; Newton et al., 2000). The factorial validity and internal reliability of MMCSQ has been supported

with young athletes (Appleton et al., 2013). The subscales of the multi-dimensional measure have been previously validated with dancers in separate studies (e.g., Quested & Duda, 2009a, 2009b, 2010). The stem "In this class…" preceded the five items and dancers were asked to respond on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). Scores from the autonomy support, task-involving, and social support items were averaged to create a composite score for dancers' perceptions of empowering class climates. A composite score for dancers' perceptions of disempowering class climates was created by averaging scores from the teacher control and ego-involving items.

**Basic Psychological Need Satisfaction**. Dancers' basic psychological need satisfaction was assessed using 3 items, one from each of the following measures; the autonomy scale ("I felt free to express my ideas and opinions"; Deci et al., 2001), the competence subscale from the Intrinsic Motivation Inventory ("I felt I was satisfied with my dancing"; McAuley, Duncan, & Tammen, 1989), and the acceptance subscale from the Need for Relatedness Scale ("I felt people valued me"; Richer & Vallerand, 1998). The psychometric properties of these measures have all been previously supported with vocational dancers (Quested et al., 2013). The stem "In this class" preceded items which dancers were asked to respond to on a 5-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*). Aligned with previous research (e.g., Bartholomew et al., 2011a) the three items were used to create a composite basic psychological need satisfaction score.

**Basic Psychological Need Thwarting.** The extent to which dancers felt their basic psychological needs were thwarted in the class was measured using 3-items from the Psychological Need Thwarting Scale (Bartholomew et al., 2011b). The stem "In this class…" was used before items (e.g., "I felt rejected by those around me"). All items were rated on a scale of 1 (*strongly disagree*) to 5 (*strongly agree*). A composite basic psychological need

thwarting score was created by averaging all 3 items. The PNTS has been found to have acceptable reliability and validity with athletes (Bartholomew et al., 2011b) and recreational dancers (Hancox et al., under review).

**Positive and Negative Affect.** Immediately prior to and post-class, dancers completed the short form Positive and Negative Affect Schedule (PANAS; MacKinnon et al., 1999). The short form of the PANAS includes 5 items measuring positive affect (e.g., "excited") and 5 items measuring negative affect (e.g., "upset"). Dancers were asked to respond to the items in terms of how they feel "right now/at this moment" on a 5-point scale from 1 (*not at all*) to 5 (*extremely*). Data were aggregated and averaged to create positive and negative affect composite scores. The factorial validity of the short form of the PANAS has been previously supported (MacKinnon et al., 1999).

## Data analysis

Multilevel Modelling (MLM) was employed using version 2.26 of the MLwiN software (Rasbash, Steele, Browne, & Goldstein, 2012). Multilevel analysis is a useful statistical technique for analysing hierarchical data and allows simultaneous examination of both within- and between-person effects (Bolger et al., 2003). Data were screened for errors, univariate and multivariate outliers, and normality following the guidelines of Tabachnick and Fidell (2007). Skewness and kurtosis values are displayed in Table 5.1 and meet the criteria for univariate normality (Kline, 2010). Mahalanobis distances revealed six multivariate outliers that were subsequently removed. Missing data were not imputed in this study as multilevel modelling can make use of all available data in the estimation of model parameter without deleting cases with missing values (Kwok et al., 2008).

Data were analysed using multivariate multilevel modelling (MVML). A multivariate multilevel model has several dependent variables. Snijders and Bosker (2012) explain that the

multivariate approach is more powerful than the univariate approach, especially if the dependent variables are correlated. This approach reduces the possibility for Type I error, which is inherent when carrying out separate tests for each dependent variable. The MVML model has one more level than the number of levels of hierarchy in the data. Level 1 (measurement level) includes the dependent variables (positive and negative affect). These were nested within occasions at level 2 (time level) which, in turn, were nested within individuals at level 3 (person level).

Prior to analyses, data were converted to z-scores so that the all regression coefficients in the multilevel modelling analyses were standardized coefficients. All level 2 predictors (e.g., perceptions of empowering climate) were centered on each dancer's individual mean, and dancers' age (a Level 3 predictor) was centered on the grand mean (Singer & Willet, 2003). In the model testing, first the effects of demographic variables on changes in dancers' positive and negative affect from pre-class to post-class (by controlling for pre-class affect) were examined. Significant predictors were included in subsequent analyses. To examine the interrelationships specified in BPNT (Deci & Ryan, 2000), three MVML models were tested, based on the recommendations of Krull and MacKinnon (1999, 2001). The first MVML model (Table 5.2, Model 1) examined whether dancers' perceptions of an empowering teacher climate predict changes in dancers' positive affect during class, and whether dancers' perceptions of a disempowering teacher climate predict changes in negative affect during class. The second MVML model (Table 5.2, Model 2) examined whether dancers' perceptions of an empowering teacher climate predict dancers' basic need satisfaction during class, and whether dancers' perceptions of a disempowering teacher climate predict dancers' basic need thwarting during class. The third MVML (Table 5.2, Model 3) examined whether when controlling for an empowering teacher climate, dancers' basic need satisfaction predict

dancers' changes in positive affect during class, and whether when controlling for a disempowering teacher climate, dancers' basic need thwarting predict dancers' changes in negative affect during class.

The mediating role of basic psychological need satisfaction between empowering teacher climates and dancers' changes in positive affect during class, and the mediating role of basic need thwarting in the relationship between disempowering teacher climates and dancers' changes in negative affect during class, were tested following the recommendations of Krull and MacKinnon (1999, 2001) for single level multiple mediator models with fixed effects. The indirect effect via each mediator was calculated as the product of $\beta a \beta b$; where $\beta a$ is the path predicting the mediator from the independent variable (Table 5.2, Model 2), and $\beta b$ is the path predicting the dependent variable from the independent variable and the mediator (Table 5.2, Model 3).

## Results

### Preliminary analyses

To calculate descriptive statistics and bivariate correlations between class measures (Table 5.1), class data for each variable was averaged across days to create aggregate scores. Mean scores indicate that dancers generally perceived the teacher-created climate in class to be more empowering than disempowering, experienced higher need satisfaction than need thwarting during class and reported higher levels of positive affect compared to negative affect both pre- and post-class. The directions of the bivariate correlations between variables are aligned with the propositions of BPNT (Deci & Ryan, 2000).

Prior to the main analysis, examination of the intra-class correlation coefficients indicated that 58% of the variance in dancers' reported changes in positive affect and 41% of

dancers' reported changes in negative affect during class are explained at the intra-individual level, supporting the use of multilevel modelling to control for the dependency of scores within individuals. A series of multilevel models were conducted to test for differences in dancers' affective states after class (controlling for pre-class affective states) as a result of various demographic variables, such as age, gender, years of dance experience, years at current school, time of day of dance class (i.e., morning or afternoon), genre, and school. Analyses revealed no significant differences in dancers' reported change in negative affect during class as a function of any tested demographic variables. Differences in changes in positive affect were evident as a result of dancers' age ($\beta$ = -.13, $SE$ = .04, $p$ < .001), with younger dancers reporting greater changes in positive affect during class. Out of the 4 schools included in the study, there was a significant difference between school 1 and 3 ($\beta$ = -.44, $SE$ = .16, $p$ = .003), with dancers' in school 3 reporting significantly less changes in positive affect during classes compared to the dancers at school 1. Furthermore, there were significant differences between dancers' reported changes in positive affect as a result of class genre (Ballet = 0, Jazz = 1, Contemporary = 2, Choreography = 3, Modern = 4), with dancers in modern classes reporting less changes in positive affect in comparison to dancers in ballet classes ($\beta$ = -.28, $SE$ = .13, $p$ = .03). Hence, dancers' age, school, and class genre were included in a baseline model (along with pre-class affect) upon which all subsequent models were built.

**Empowering Teacher Climate, Basic Need Satisfaction and Changes in Positive Affect**

Dancers' perceptions of an empowering climate in class positively predicted dancers' changes in positive affect ($\beta$ = .26, $SE$ = .03, $p$ < .001) during class (Table 5.2, Model 1). Dancers' perceptions of an empowering climate positively predicted ($\beta$ = .40, $SE$ = .03, $p$ < .001) dancers' basic need satisfaction during class (Table 5.2, Model 2). When controlling for

an empowering climate (Table 5.2, Model 3), basic need satisfaction positively ($\beta$ = .24, *SE* = .04, *p* < .001) predicted dancers' changes in positive affect during class. Over and above the baseline model, dancers' perceptions of an empowering climate within class and basic need satisfaction during class explained 19.04% of within-person variation in dancers' changes in positive affect during class. Results revealed a significant indirect effect of dancers' perceptions of an empowering climate within class on changes in positive affect during class via basic need satisfaction ($\beta$ = .09, *SE* = .02, *z* = 5.38, C.I. = .06 - .13).

**Disempowering Class Climates, Basic Needs and Changes in Affective States**

Dancers' perceptions of a disempowering climate positively predicted changes in dancers' negative affect ($\beta$ = .11, *SE* = .04, *p* < .01) during class (Table 5.2, Model 1). Dancers' perceptions of a disempowering climate positively predicted ($\beta$ = .28, *SE* = .04, *p* < .001) dancers' basic need thwarting during class (Table 5.2, Model 2). When controlling for a disempowering climate (Table 5.2, Model 3), basic need thwarting positively ($\beta$ = .23, *SE* = .04, *p* < .001) predicted dancers' changes in negative affect during class. Over and above the baseline model, dancers' perceptions of a disempowering climate and basic need thwarting within class explained 42.74% of within-person variation in dancers' changes in negative affect during class. Results revealed a significant total mediating effect of dancers' basic need thwarting between perceptions of a disempowering teacher climate and dancers' changes in negative affect during class ($\beta$ = .06, *SE* = .01, *z* = 4.65, C.I. = .04 - .09).

Table 5.1

*Descriptive Statistics: Mean Scores (M), Standard Deviations (SD), Skewness (S), Kurtosis (K), and Bivariate Correlations for Study Variables*

*Averaged Across all Time Points.*

| | M | SD | S | K | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Pre-class Positive Affect | 3.50 | .86 | -0.28 | -0.37 | | | | | | | |
| 2. Pre-class Negative Affect | 1.37 | .57 | 1.85 | 3.05 | -.18** | | | | | | |
| 3. Empowering | 3.79 | .82 | -0.61 | 0.15 | .32** | -.18** | | | | | |
| 4. Disempowering | 2.45 | .99 | 0.42 | -0.34 | -.12** | .23** | -.24** | | | | |
| 5. Basic Need Satisfaction | 3.31 | .82 | -0.17 | -0.27 | .47** | -.24** | .53** | -.26** | | | |
| 6. Basic Need Thwarting | 1.99 | .78 | 0.54 | -0.33 | -.12** | .38** | -.30** | .44** | -.22** | | |
| 7. Post-class Positive Affect | 3.48 | .93 | -0.37 | -0.49 | .69** | -.12** | .40** | -.17** | .59** | -.15** | |
| 8. Post-class Negative Affect | 1.39 | .67 | 1.86 | 3.04 | -.10** | .61** | -.26** | .30** | -.28** | .44** | -.20** |

*Note.* All responses were provided on a 1-5 point scale. **$p < .01$.

Table 5.2

*MVML Models Examining the Interrelationships between Dancers' Perceptions of Empowering Class Climates, Basic Need Satisfaction and Thwarting and Changes in Positive and Negative Affective States during Classes*

| | Model 1 | | | | Model 2 | | | | Model 3 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Positive Affect | | Negative Affect | | Basic Need Satisfaction | | Basic Need Thwarting | | Positive Affect | | Negative Affect | |
| Predictors | β | SE | β | SE | β | SE | β | SE | β | SE | β | SE |
| Empowering Climate | 0.26*** | 0.03 | | | 0.40*** | 0.03 | | | 0.19*** | 0.04 | | |
| Disempowering Climate | | | 0.11** | 0.04 | | | 0.28*** | 0.04 | | | 0.06 | 0.04 |
| Basic Need Satisfaction | | | | | | | | | 0.24*** | 0.04 | | |
| Basic Need Thwarting | | | | | | | | | | | 0.23*** | 0.04 |
| Random error at within-person level | 0.34 | 0.02 | -0.09 | 0.02 | 0.34 | 0.02 | -0.01 | 0.02 | 0.32 | 0.02 | -0.07 | 0.02 |
| % of variance explained at the individual level | 11.93 | | 21.37 | | 20.71 | | 88.76 | | 19.04 | | 42.74 | |

*Note.* *p < .05, **p < .01, ***p < .001. The percentage of variance explained at the individual level is calculated over and above the baseline model which includes dancers' age, school, class genre and pre-class affect (for models 1 and 3).

**Discussion**

Grounded in BPNT (Deci & Ryan, 2000) and pulling from Duda's (2013) conceptualisation of the social environment as a multi-dimensional construct based on an integration of environmental dimensions proffered by AGT and SDT, the purpose of this study was to examine the processes via which social-environmental conditions may account for within-person variations in dancers' affective states during class. More specifically, this study investigated whether dancers' perceptions of empowering and disempowering climates in dance class predict changes in dancers' affective states during class. Secondly, the mediating role of dancers' basic need satisfaction and thwarting in class between dancers' perceptions of the teacher-created climate in class and dancers' changes in affective states during class was tested. Taken in their totality, the findings support the tenets of BPNT at the within-person level (Deci & Ryan, 2000) advancing understanding of the social-psychological mechanisms that may underpin daily fluctuations in individuals' optimal and compromised functioning within classes.

**Empowering and Disempowering Teacher Climates and Affective States**

In support of the hypotheses, dancers' perceptions of an empowering teacher-created climate in class positively predicted changes in dancers' positive affect. Furthermore, dancers' perceptions of a disempowering teacher climate positively predicted changes in dancers' negative affect during classes. These results are aligned with previous research with athletes (Bartholomew et al., 2011a; Gagne et al., 2003) and vocational dancers (Quested et al., 2013) that independently examined relations between autonomy supportive and controlling dimensions of the coach/teacher-created climate and changes in individuals' affective states pre- to post-training. However, this study builds on previous research (Bartholomew et al., 2011a; Gagne et al., 2003; Quested et al., 2013) by consolidating the prominent social-

environmental dimensions emphasised in AGT and SDT, to create a more comprehensive picture of the types of teacher behaviours that may have relevance for students' changes in affective states during class.

Hence, in order for teachers to foster dancers' optimised and sustained emotional well-being during class, in addition to supporting dancers' autonomy, teachers also need to show students that they care about them as individuals and encourage self-referenced competence on a daily basis. Furthermore, in order to limit dancers' experiences of negative emotions during class, it is not just the extent to which a teacher reduces/eliminates controlling behaviours, but also how competence is recognised (i.e., whether normative comparisons are emphasised), that is important. Hence, the results provide initial support for Duda's (2013) conceptualisation of the social-environment as multi-dimensional. Furthermore, the findings highlight the significant role that the teacher and the climate that they create in class can have on students' emotional states during class. It is important to note that the MMCSQ was developed to capture a broad array of coach motivation-related behaviours. However, the diary methodology employed in the study resulted in only one item representing each subscale of the MMCSQ. Thus, the findings of this study are limited in their ability to accurately reflect the underlying characteristics of 'empowering' and 'disempowering' teacher-created motivational climates.

**The Mediating Role of the Basic Psychological Needs**

The second aim of this study was to investigate the processes via which dancers' perceptions of the teacher-created climate account for within-class changes in dancers' affective states. In support of the hypotheses, the tenets of BPNT (Deci & Ryan, 2000), and in line with previous research with vocational dancers (Quested, 2010), the relations between dancers' perceptions of an empowering teacher climate and changes in dancers' positive

affect during class was mediated by dancers' basic need satisfaction. Hence, the results suggest that when dance teachers promote self-initiated strivings, individual-referenced ability, and create a caring environment in class, this fosters the satisfaction of dancers' basic psychological needs during lessons. Heightened satisfaction of these needs, in turn, leads to dancers experiencing more positive emotions within class.

This study was the first to examine the mediating role of basic need thwarting at the within-person level. Dancers' basic psychological need thwarting mediated the relationship between dancers' perceptions of disempowering climates and changes in dancers' negative affect pre- to post-class. These results indicate that dancers who perceive their teacher to exhibit controlling behaviours and stress normative comparisons in class are more likely to perceive their basic psychological needs as being obstructed and actively undermined. Such need thwarting may, in turn, lead to dancers experiencing more negative emotions.

Overall, in support of SDT, these findings imply that teachers may influence their students' affective states via the extent to which they emphasise specific facets of the social-environment (i.e., autonomy support, social support, and/or control) and whether these facets satisfies and/or thwarts students' basic psychological needs. Furthermore, building on previous research with athletes (Bartholomew et al., 2011a; Gagne et al., 2003) and vocational dancers (Quested et al., 2013), this study highlights the importance of how competence is evaluated in class. Aligned with AGT, the results imply that it is not just enough for teachers to promote competence, how they do it (i.e., self-referenced or other-referenced) matters.

**Practical Implications**

The results of this study suggest that the type of climate that teachers create in class has implications for students' changes in emotional states during class. Considering the important implications of students' emotional/mood states for quality of learning and

achievement in education contexts (Bryan et al., 1996; Pekrun et al., 2009; Villavicencio & Bernardo, 2013) an understanding of the social-psychological mechanisms that may underpin individuals' optimal and compromised functioning within classes is essential. An in-depth knowledge of these processes can inform interventions which aim to educate teachers as to how they can support young individuals' optimal development and psychological well-being on a daily basis. An education training programme theoretically grounded in the multi-dimensional conceptualisation of the climate (based on AGT and SDT), such as that described by Duda (2013), would be beneficial in education contexts.

**Conclusion**

In summary, the results of this study support the tenets of BPNT (Deci & Ryan, 2000), indicating that the same processes which have been evidenced to operate at the between-person level may also may also explain why a student dancer may be feeling better or worse than their own baseline at a given time (within-person variation). This study advances current knowledge by taking a multi-dimensional approach to the measurement of the social environment and being the first to examine the mediating role of basic need thwarting at the within-person level. From an applied perspective, the findings advance understanding of the social-psychological mechanisms that may underpin individuals' optimal and compromised functioning within classes.

**General Discussion**

Grounded in SDT (Deci & Ryan, 1985, 2000) and drawing from AGT (Nicholls, 1989), this thesis comprised a series of studies with the broad aim of advancing current theoretical understanding and measurement of motivational processes within the dance domain in particular. This was achieved by a series of studies addressing key conceptual and methodological issues apparent in research undertaken in the dance context, as well as the wider SDT literature. More specifically, the studies in this thesis aimed to progress the conceptualisation and measurement of key motivational constructs (i.e., the teacher-created social environment and motivation regulations) in terms of their application in dance settings. In addition, the studies comprising this thesis aimed to enhance understanding of the motivational processes via which the teacher-created social environment, as a multi-dimensional construct, predicts dancers' affective outcomes. In particular, the mediating role of basic psychological need thwarting and motivation regulations between dancers' perceptions of the teacher-created social environment and their affective states, were examined.

Research into the social-psychological processes and mechanisms that may underpin dancers' optimal or compromised functioning is still in its infancy. Thus, the present work was undertaken to facilitate a greater understanding of how to promote healthy, continued participation and circumvent compromised, unhealthy engagement in dance via the application of adaptive motivational principles. It is hoped that such knowledge can be used in the future to contribute to the development and testing of interventions that will serve to optimise dancers' health and motivation.

Collectively, as a body of work, the studies contained within this thesis support the central hypotheses of the SDT framework (Deci & Ryan, 2000). In studies 1 and 3, a number of important theoretical and measurement issues related to SDT have been addressed. Studies

2 and 4 are the first to examine the important role of basic psychological need thwarting (Bartholomew et al., 2011b) in determining health-relevant outcomes in dancers. Furthermore, the results of study four provide initial support for Duda's (2013) conceptualisation of the multi-dimensional motivational climate and its predictive utility in terms of within-person variation in affective states. This final chapter draws together and discusses the key findings from the empirical studies comprising this thesis. General limitations, future directions, and practical implications for dance and other physical activity and achievement contexts are also considered.

**Measurement and Conceptualisation of the Teacher-Created Social Environment**

In order to generate a comprehensive understanding of the determinants of individuals' quality of motivation and healthful functioning in achievement settings, it is important to consider the contributing role of a range of social-environmental factors. This thesis examined five of the main dimensions (e.g., perceptions of autonomy support, control, task- and ego-involving features, and social support) which have been considered in research framed in SDT and AGT to have important implications for individuals' basic psychological needs, motivation, and experienced well-and ill-being (Duda, 2013). Within the present body of work, dimensions of the social environment (i.e., autonomy support, control, social support, and task- and ego-involving features) were assessed both independently (studies 2 & 3) and collectively using a multi-dimensional measure (study 4).

The social factors which may influence individuals' basic needs, motivation and well-being are assumed to operate at three levels of generality; global (i.e., general across several life domains), contextual (i.e., specific to one domain), and situational (i.e., specific to a particular activity and time) (Vallerand & Ratelle, 2002). Examination of motivational

processes at these different levels of generality is useful to further understand the 'true' complexity of motivation. Different types of motivation may exist at the three levels of generality. For example, at the global level, an individual may generally participate in activities out of enjoyment. However, at the contextual level, an individual may be intrinsically motivated in one domain (e.g., dance) but externally motivated in another (e.g., school). The individual's motivation may vary further depending upon the situation. In order to develop interventions to optimise motivation, a comprehensive understanding of the determinants and consequences at the different levels of generality is needed (Vallerand & Ratelle, 2002). Within this thesis, the social-environmental factors and motivational processes theorised in SDT (Deci & Ryan, 2000) to be pertinent for optimal engagement and well-being were examined at both the contextual (studies, 1, 2, & 3) and situational (study 4) levels.

Valid and reliable measurements are essential in order to produce meaningful research in any domain. Thus, a key aim of this thesis was to explore the conceptualisation and measurement of the teacher-created social environment in dance contexts. Of particular interest to this thesis was establishing the validity of an existing measure of the motivational climate when employed with dancers. Study 3 aimed to explain limitations with the measurement of task- and ego-involving features of the motivational climate that were apparent in previous studies with dancers (Quested & Duda, 2009a, 2010; Nordin-Bates et al., 2012; Norfield & Nordin-Bates, 2012). In particular, past research (Quested & Duda, 2010) has highlighted psychometric limitations with the modified version of the PMCSQ-2, which may be attributable to the applicability of item content to dance. Thus, study 3 investigated whether the wording of the adapted PMCSQ-2 is contextually relevant to dance contexts.

Overall study 3 provided support for the content validity of the PMCSQ-2 (adapted for dance by Quested & Duda, 2009a) with dancers from a variety of dance settings and ability

levels. Results revealed 72% of participant responses to the items to present no problems. Furthermore, only a small percentage (5%) of the problems identified were purely dance specific. This is encouraging in terms of the potential utility of sport-based measures in dance. The findings also highlight general problems for researchers to consider when using self-report questionnaires. For example, one of the more general problems identified was that many participants failed to interpret items in relation to the stem "In this dance school/company or group". It is recommended that when administering questionnaires researchers should be particularly attentive to clarifying and regularly stressing the particular context within which participants are required to interpret the questions. The finding that dancers often did not interpret items in relation to the relevant context informed questionnaire administration protocols adopted throughout the studies in this thesis. For example, when administering the questionnaires to dancers in subsequent studies, the importance of responding to items in relation to the environment in which they dance was clearly emphasised in both the verbal and written instructions.

The second aim of study 3 was to determine whether the sub-dimensions of task- and ego-involving climates captured in the subscales of the PMCSQ-2 are relevant and meaningful in dance contexts. It is important to note that the subscales in the PMCSQ-2 were derived from research conducted in competitive team sport contexts (Newton et al., 2000). Previous research with vocational dancers (Quested & Duda, 2010) has reported problems of cross-loading with the items on the intra-team rivalry scale. Quested and Duda (2010) theorised that this may be due to dancers having trouble with the interpretation and comprehension of the idea of "outperforming" other dancers. Furthermore it has been proposed that the construct of intra-team member rivalry may be less relevant to vocational dancers than to sports team members (Quested & Duda, 2010).

The think aloud protocol employed in study 3 enabled examination of these problematic items that would not have been possible through quantitative psychometric analysis alone. In line with Quested and Duda's (2010) hypothesis, the results revealed dancers to have trouble identifying when they outperform other dancers. However, the dancers' thoughts articulated 'out loud' indicated this may not be due to intra-team rivalry being less relevant in dance contexts, as has previously been suggested (Quested & Duda, 2010). Instead dancers seemed to struggle with using the information retrieved from their memory or value system to make a judgement as to whether they have outperformed the other dancers in performance situations. This appeared to be due to the diverse and subjective nature of dance performance and the variety of criterion with which dancers use to judge whether they have outperformed another dancer. During the think aloud interviews, a number of dancers pointed out that rivalry or interpersonal comparison may occur in other situations not captured by the items, such as during class or auditions. Furthermore, dancers alluded to various standards (e.g., effort, artistry, technical execution) which dancers use for interpersonal comparison. Thus, it may be that the wordings of the items in the PMCSQ-2 do not accurately capture the construct of intra-team rivalry/interpersonal comparison as manifested in dance settings.

The findings of study 3 could lead to speculation about the content validity of the PMCSQ-2 intra-team member rivalry items with athletes. Past research in sport contexts (Newton et al., 2000; Vazou et al., 2006) has reported the intra-team rivalry subscale to be problematic in terms of internal consistency. The PMCSQ-2 has also more recently been adapted for other non-sport settings, such as physical education (e.g., González-Cutre, Scicilia, Moreno, & Fernandez-Balboa, 2009) and exercise (Huddleston, Fry, & Brown, 2012). González-Cutre et al., (2009) also report the intra-group member rivalry subscale to

have poor internal consistency in physical education contexts with a Cronbach's alpha co-efficient of .61. The poor internal consistency may be due to the small number of items ($n = 3$) making up the intra-team rivalry subscale. Findings from a recent study by Keegan, Harwood, Spray, and Lavalle (2014) highlights that there may be more to rivalry than is captured by the items in the PMCSQ-2. For example, employing a qualitative methodology Keegan and colleagues found athletes to describe a type of 'positive rivalry' within elite sport contexts. Thus, future research investigating how rivalry is manifested in the different achievement contexts and whether the intra-team rivalry items in the PMCSQ-2 fully capture this construct as it is construed within sport, physical education, exercise, and dance contexts would be valuable. Such research may lead to the generation of new and/or additional items which more accurately reflect the nature of rivalry/interpersonal comparison in achievement contexts.

### *What* social-environmental conditions predict variation in dancers' affective states?

**The Role of Controlling Teacher Behaviours.** Five dimensions of the teacher-created social environment (i.e., autonomy support, social support, task-involving, and ego-involving behaviours) have been considered to have important implications for basic need satisfaction in past research with dancers (e.g., Quested & Duda, 2009a, 2010, 2011a, 2011b; Quested et al., 2013). However, a facet of the motivational climate that is hypothesised to be important in predicting maladaptive functioning (namely, controlling teacher behaviours) has been largely neglected. Drawing from Bartholomew et al.'s, (2011a, 2011b) conceptualisation of a controlling coach/teacher interpersonal style being a multi-dimensional construct distinct from autonomy support, study 2 was the first investigation in dance to comprehensively examine controlling teacher behaviours as a determinant of affective states. Although developed for

use in sport contexts, the Controlling Coach Behaviors Scale (Bartholomew et al., 2010) (with minor modifications for dance) demonstrated good factorial validity among recreational dancers in study 2.

Past studies with athletes (Bartholomew et al., 2011a, 2011b) have highlighted the importance of concurrently assessing the social-environmental conditions that support as well as frustrate athletes' psychological needs in order to explain more variance in indicators of well-being as well as ill-health. In previous dance research (Quested & Duda, 2010, Quested et al., 2013), perceptions of autonomy support and basic need satisfaction have been found to explain less variance in indices of ill-being (i.e., negative affect & exhaustion) when compared to variance explained in well-being. Hence, it has been proposed (Quested, 2010) that more maladaptive features of the social environment (such as teachers' controlling behaviours) and basic need thwarting may explain more variance in indicators of dancers' ill-being.

Hence, study 2 examined the extent to which recreational dancers' perceptions of teachers' autonomy supportive and controlling behaviours, predicted basic need satisfaction and thwarting and, in turn, dancers' positive and negative affect experienced over recent weeks. Findings revealed the model to account for 39% of variation in dancers' positive affect. The percentage of variance explained is similar to that reported by Quested and Duda (2010) who found the teacher-created social environment (i.e., autonomy supportive, task- and ego-involving behaviours) and basic need satisfaction to explain 41% of variance in vocational dancers' positive affect. The slightly lower percentage accounted for in study 2 compared to Quested and Duda's (2010) study may be due to task-involving teacher behaviours not being included in the model in study 2. Task-involving climates have been found to predict additional variance in dancers' positive affect, not accounted for by

perceptions of autonomy support (Quested & Duda, 2010). Thus, including both autonomy support and task-involving dimensions may have predicted more variance in positive affect, over autonomy supportive teaching alone.

In terms of explaining variation in dancers' negative affect, the model tested in study 2 explained 43%, which is considerably higher than the 25% accounted for in Quested and Duda's (2010) model (which did not include perceived teacher control or basic need thwarting). These findings suggest dancers' perceptions of teacher controlling behaviours and basic need thwarting explain significant additional variance in indicators of ill-being in addition to what is accounted for by autonomy supportive teaching.

To further explore the hypothesis that teacher control and basic need thwarting (rather than autonomy support and need satisfaction) better account for variation in potentially maladaptive outcomes, additional analyses within study 2 were conducted. Findings revealed controlling teacher behaviours and basic need thwarting to account for 40% of variation in dancers' reported negative affect, whereas autonomy support and basic need satisfaction explained only 11% of variation in this outcome. Thus, the findings of study 2 emphasise the importance of dance researchers measuring dancers' perceptions of teacher controlling behaviours and basic need thwarting when examining predictors of ill-being, as they better account for variation in potentially maladaptive outcomes. Previous research with dancers (Quested & Duda, 2010) has also found an ego-involving climate to make a distinctive contribution to the prediction of dancers' negative affect. Thus, it may be that dancers' negative affect may be better accounted for if dancers' perceptions of ego-involving teaching were included alongside perceptions of controlling teacher behaviours.

**The Multi-dimensional Teacher-Created Social Environment.** Past research with dancers (e.g., Quested & Duda, 2009a, 2010) has examined the predictive utility of both dimensions of the motivational climate underscored within SDT (e.g., autonomy support) and AGT (e.g., task- and ego-involvement). For example, Quested and Duda (2009a, 2010) measured dancers' perceptions of teacher autonomy support, alongside perceptions of the task- and ego-involving dimensions of the climate. In order to more comprehensively examine *what* social-environmental conditions may predict variation in dancers' motivation and well-being the final study adopted Duda's (2013) multi-dimensional conceptualisation of the motivational climate. Integrating AGT and SDT, Duda (2013) posits that the social environment can be more or less empowering (autonomy supportive, socially supportive, and task-involving) and/or disempowering (controlling and ego-involving) depending on which social-environmental characteristics are emphasised. Thus, study 4 builds on study 2 and 3 and other research in dance contexts (e.g., Quested & Duda, 2009a, 2010, 2011a; 2011b; Quested et al., 2013) by examining the degree to which empowering and disempowering facets of the motivational climate predict dancers' basic need satisfaction and thwarting.

The majority of SDT-based research conducted with athletes (e.g., Reinboth et al., 2004) and dancers (e.g., Quested & Duda, 2010, 2011a) has examined the social-environmental factors and motivational processes that may explain *between-person* variation in motivation and well-being within a specific domain. Less research in sport (e.g., Gagne et al., 2003; Bartholomew et al., 2011a) and dance (Quested et al., 2013) contexts has examined the social-environmental factors and motivational processes that may explain *within-person* variation in optimal engagement and well-being at the situational level. Understanding the social psychological factors and motivational processes operating in a specific activity at a particular time is important in order to accurately delineate the determinants of variation in

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individuals' emotional states and promote optimal functioning on a daily basis. In vocational dance contexts, dancers train on average 9 hours a day, and take a variety of classes in different genres, taught by different teachers. In order for dancers to achieve their potential in terms of development and performance, they need to be able to function optimally in all their various classes.

Thus, study 4 advances both the dance and wider SDT literature by adopting Duda's (2013) multi-dimensional conceptualisation of the motivational climate to examine changes in dancers' affective states at the within-person level. The use of a diary methodology afforded the possibility of examining the social-environmental factors and motivational processes that may influence within-person variability in reported affective states during 10 dance classes. Findings revealed dancers' perceptions of an empowering climate and basic need satisfaction during class to account for approximately 19% of within-person variation in dancers' changes in positive affect pre- to post-class. Dancers' perceptions of a disempowering climate and basic need thwarting within class explained more than 42% of within-person variation in dancers' changes in negative affect during class. Unfortunately the percentage of variance explained cannot be compared to previous research with athletes (Bartholomew et al., 2011a) as the $R^2$ values were not reported in the study conducted by Bartholomew and colleagues. Furthermore, in their study with vocational dancers, Quested et al. (2013) only report the variance accounted for when both typical and daily autonomy supportive environments are included in the model. Thus, their results also cannot be directly compared to those of study 4. However, it is expected that measuring empowering and disempowering dimensions of the teacher-created climate would predict more variance over just examining one or two dimensions of the climate (i.e., autonomy support and/or controlling behaviours) as has been

the case in previous research athletes (Bartholomew et al., 2011a; Gagne et al., 2003) and dancers (Quested et al., 2013).

Another limitation of previous research examining the effects of the social environment created in training on individuals' affective states (Bartholomew et al., 2011a; Gagne et al., 2003; Quested et al., 2013) is the use of univariate multi-level modelling. Study 4 further advances the literature by analysing the diary data using multivariate multilevel modelling (MVML). MVML allows examination of more than one dependent variable (i.e., both changes in positive and negative affect) within a model and has a number of advantages over conducting a series of univariate analyses. Firstly, MVML takes into account the possible relationships between different dependent variables in a multivariate model which decreases the chance of making a type 1 error (e.g., finding a significant effect of empowering teacher-created climate on changes in dancers' negative affect during class, where in reality there is no effect). To illustrate this point, let's take a hypothetical example in which two dependent variables (positive and negative affect) are correlated, but the independent variable of interest (i.e., dancers' perceptions of an empowering teacher-created climate) only has a 'real' effect on one of the dependent variables (i.e., positive affect). If separate univariate multilevel models are executed, this may result in finding a 'false' significant effect of the independent variable on both dependent variables. This may be due to the independent variable (i.e., empowering teacher climate) having an effect on one outcome measure (i.e., positive affect) which is related to the other dependent variable of interest (i.e., negative affect). However, if both dependent variables are analysed in one model then the correlation between the variables is taken into account and it is more likely that only the 'true' effect on each of the two dependent variables will be found. Another advantage of MVML is that there is more statistical power than when using a series of univariate models (Snijders & Bosker,

2012). A larger statistical power decreases the chance of type 2 error occurring (e.g., not finding a significant effect where in reality there is one) (Hox, 2010).

It is important to note that in study 4 it was not possible to control for clustering of data due to the complexity of the timetabling within all four participating vocational dance schools. For example, within each vocational dance school, the way that students are grouped varies. Dancers may have multiple teachers both within and between different classes depending on the genre. Not controlling for this variation in clustering within teachers and classes may violate the statistical assumption of independence because observations from dancers within the same group (or with the same teacher) tend to be more similar than observations from different groups (or with different teachers). Hence, future research focusing on just one dance school may enable researchers to control for the class and/or teacher via the use of cross-classified multilevel modelling. In cross-classified data, lower level units (e.g., persons) can belong to pairs or combinations of higher level units (e.g., teacher and/or class) (Fielding & Goldstein, 2006). Such an approach to analysis would be advantageous because it recognises the true complexity of the structures operating in vocational dance schools and controls for shared influences of different teachers and classes on variation in students affective responses. However, there are also limitations of conducting research in only one school, including small sample sizes and lack of generalizability of results to the vocational dance school population as a whole. Hence, four schools were utilised in study 4 of this thesis.

Overall this thesis provides a more comprehensive examination of perceptions of the teacher-created motivational climate in dance contexts than has been done before. In contrast to the typical stereotype of dance teachers as employing highly controlling and demanding teaching methods (e.g., Hamilton, 1997; Van Rossum, 2004), this thesis reveals a positive

picture of dance teaching environments. Throughout the research reported in this thesis, mean scores reveal dancers to perceive the teacher-created environment to be more autonomy supportive than controlling (study 2), more task- than ego-involving (study 3), and more empowering than disempowering (study 4). These findings suggest that dance environments are not as highly characterised by rivalry and control as has been previously reported (Hamilton, 1997; Hamilton et al., 1997). However, it is important to note that there was evidence of variability in the dancers' perceptions of the teacher-created social environment (see Table 6.1) in regard to all dimensions assessed. This indicates that not all dancers perceived the motivational climate created by their dance teachers to be empowering. Furthermore, in study 4 results revealed variation in dancers' perceptions of the social environment created within different classes. The within-person variability in dancers' perceptions of the teacher-created social environment within class demonstrates that, within vocational dance schools, adaptive teaching environments are not consistently observed and evident in all lessons.

Table 6.1

*Dancers' Mean Scores (M), Standard Deviations (SD) and Ranges of Responses are presented for each of the Dimensions of the Teacher-Created Social-Environment Examined*

| Social-Environmental Dimension | Study 2 M (SD) Range Min-Max | Study 3 M (SD) Range Min-Max | Study 4 M (SD) Range Min-Max |
|---|---|---|---|
| Autonomy support | 3.82 (0.63) 1.85-5.00 | | |
| Control | 1.95 (0.64) 1.00-4.27 | | |
| Task-involving | | 4.43 (0.75) 1.69-5.00 | |
| Ego-involving | | 2.72 (0.74) 1.38-4.25 | |
| Empowering | | | 3.79 (0.82) 1.00-5.00 |
| Disempowering | | | 2.45 (0.99) 1.00-5.00 |

*Note.* All measures used a 5-point Likert scale.

It is important to note that another key dimension of the social-environment theorised within SDT to have important implications for individuals' basic psychological needs and internalisation of motivation is structure (Deci & Ryan, 2002). Structure has been defined as the degree to which significant others provide clear and consistent expectations and timely and informative feedback (Reeve, 2002). According to SDT, structure can be provided in either an autonomy-supportive or a controlling way (Deci & Ryan, 1985). When presented in an autonomy supportive way structure has been found to be associated with positive outcomes, such as, higher satisfaction of need for competence, self-determined motivation and engagement (Deci & Ryan, 1991; Jang, Reeve, & Deci, 2010; Sierens, Vansteenkiste, Goossens, Soenens, & Dochy, 2009). However, when presented in a controlling way structure can be detrimental to student engagement (Jang et al., 2010; Sierens et al., 2009). Although there is growing evidence for the importance of considering the predictive utility of structure provided by significant others, structure was not assessed in this thesis because it is not currently a subscale of the MMCSQ (the self-report measure upon which study 4 drew to examine dancers' perceptions the motivational climate from a multi-dimensional perspective). As structure can be provided in either an autonomy-supportive or a controlling way it does not neatly fit into either the Empowering or Disempowering dimensions outlined by Duda (2013). However, this is not to say that it is not an important component of the multi-dimensional climate conceptualised within the integration of SDT/AGT. For example, structure has been included in the Multidimensional Motivational Climate Observation System developed by Smith, Tessier, and Tzioumakis (in preparation, in Tessier et al., 2013). The development of a self-report scale assessing athlete or dancers' perceptions of the structure present in the motivational climate would be an interesting direction for future research.

**How Social-Environmental Conditions Predict Variation in Individuals' Affective States**

**The Role of Basic Psychological Need Thwarting.** The second aim of the thesis was to examine the motivational processes via which the teacher-created social environment, as a multi-dimensional construct, predicts dancers' affective outcomes. The BPNT hypothesis (Deci & Ryan, 2000) that perceptions of the teacher-created social environment are relevant to the degree of basic need satisfaction experienced by individuals, and in turn, indicators of well-being has been tested and supported in the sport (Gagne & Blanchard, 2007), exercise (Edmunds et al., 2007), and dance (e.g., Quested & Duda, 2009a, 2010, 2011a, 2011b; Quested et al., 2013) literatures. However, less research conducted in physical activity/performance settings (Balaguer et al., 2012; Bartholomew et al., 2011a, 2011b) has examined the role of basic need thwarting. The paucity of studies examining the role of basic need thwarting is due to need thwarting only recently being empirically distinguished as separate from low levels of need satisfaction and predicting unique variance in targeted outcomes (Bartholomew and colleagues, 2011a).

Studies 2 and 4 are the first to consider and identify the important role of basic psychological need thwarting in determining dancers' quality of motivation and affective outcomes. In Study 2, the relatively small negative correlation (-.39) between basic need satisfaction and thwarting is similar to that observed by (Bartholomew et al., 2011a, 2011b). This supports the notion that basic need satisfaction and basic need thwarting are independent albeit negatively related constructs. Moreover, study 2 revealed that in the recreational dance setting, perceptions of 'general' controlling teacher behaviours predict dancers' basic need thwarting and, in turn, the degree of negative affect typically experienced by dancers when dancing with their group. Basic need thwarting was found to have a strong, direct role in both

the prediction of dancers' controlled (introjected and external) motivation regulations, amotivation, and negative affect. These findings highlight the important role of individuals' experiences of basic need thwarting and provide initial support for BPNT (as described by Deci & Ryan, 2000) being adapted to include basic psychological need thwarting (as detailed in Bartholomew et al., 2011b).

Study 4 builds on study 2 by being the first study in dance contexts to test the mediating role of basic need thwarti ng. In addition, study 4 extends recent work in sport contexts (Bartholomew et al., 2011a) by being the first study in any achievement context to examine the mediating role of basic need thwarting at the within-person level. Understanding the social-psychological processes that may influence changes in individuals' optimal functioning in achievement contexts is essential to the promotion of optimal training on a daily basis.

Dancers' basic psychological need thwarting mediated the relationship between dancers' perceptions of disempowering climates and changes in dancers' negative affect within class in study 4. Thus, these findings indicate that active obstruction of the basic psychological needs is one psychological mechanism linking dancers' perceptions of disempowering motivational climates to dancers' changes in negative affect during class. Thus, these results indicate that it is not just whether dancers perceive their teacher to exhibit controlling behaviours (e.g., intimidate dancers to make them perform desired behaviours) that will determine the degree of basic needs thwarting experienced, but also the extent to which the teacher stresses normative comparisons in class (i.e., by creating an ego-involving climate). Study 4 also demonstrated that when dancers' basic needs for autonomy, competence, and relatedness are obstructed and actively undermined within class this leads to dancers experiencing more negative emotions post-class.

Taken in their totality, studies 2 and 4 provide support for BPNT being adapted to include basic psychological need thwarting (as detailed in Bartholomew et al., 2011b) and operating at both the between-person and within-person levels. Furthermore, the findings highlight the important role of both the 'typical' (study 2; the usual climate created by the teacher) and 'situation-specific' (study 4; the climate created by the teacher within each class) teacher-created climates and their impact on dancers' basic need satisfaction/thwarting and affective states. Previous research with vocational dancers (Quested et al., 2013) has also recognised the importance of both the 'typical' teacher-created environment and the situation specific social environment created within class, and has examined whether these two climates may interact with each other to predict need satisfaction and changes in affect states during class. Quested et al. (2013) found a significant interaction effect, with dancers experiencing the highest levels of positive affect after class, when the typical and class-specific perceptions of teacher autonomy support were high. Together, typical and class-specific perceptions of teacher autonomy support were found to explain 21% of the variance in the dancers' changes in positive affect. Quested and colleagues (2013) explain that these findings highlight the importance of the provision of autonomy support being consistent over time and in all classes.

In terms of predicting dancers' changes in negative affect, Quested et al. (2013) found no significant interaction effect between typical and class-specific autonomy supportive teaching. This may be due to the fact that the predictive utility of only one dimension of the teacher-created social environment, autonomy support, was examined. Targeting a wider range of social-environmental dimensions may reveal other characteristics of the motivational climate to have significant interaction effects. Furthermore, the assessment of both empowering and disempowering teacher behaviours at the typical (contextual) and class-

specific (situational) levels would allow the investigation of more complex questions. For example, building on Quested et al.'s (2013) findings, it would be interesting to examine what would happen if the 'typical' climate created by the teacher is generally empowering but during a particular class the teacher is uncharacteristically disempowering. Would the 'typical' climate create a protective effect?

**The Role of the Motivation Regulations.** A central feature of SDT is that that there are qualitatively different reasons underlying behavioural engagement and that these reasons (motivation regulations) lie on a continuum of increasing self-determination (Deci & Ryan, 2000). To date, only one study (Quested & Duda, 2011a) has examined dancers' motivation from an SDT perspective. This study did not measure all six types of motivation as theorised by Deci and Ryan (2000). Measuring all the motivation regulations in the self-determination continuum is advantageous as it enables examination of the predictive ability and distinct role attributable to each motivation regulation. This thesis contributes to the dance literature by examining the validity and tenability of using the BRSQ (which assesses all six motivation regulations) in the case of different dance populations. Despite originally being designed for use in competitive sport contexts, the findings of study 1 support the use of the six-factor BRSQ in both recreational and vocational dance settings. Thus, this thesis has advanced the measurement of motivation regulations in dance contexts by providing evidence for the utility of the BRSQ (Lonsdale et al., 2008) for measuring motivation regulations in the targeted dance contexts.

Due to inconsistency in how individuals' motivation regulations for engagement have been statistically modelled in past research in any context, study 1 also explored the tenability of using different scoring protocols for analysing responses to the BRSQ. The way in which the motivation regulations have been statistically modelled in the SDT literature has varied

considerably, making it impossible to compare findings across studies and contexts. Furthermore, previous research (e.g., Quested & Duda, 2011b) has been limited by the psychometric of properties of the Sport Motivation Scale (Pelletier et al., 1995) resulting in the motivation regulations being modelled in a way which is not theoretically aligned with SDT (Deci and Ryan, 2008). For example, due to statistical limitations, Quested and Duda (2011b) modelled the motivation regulations using a higher order extrinsic factor (i.e., intrinsic, extrinsic, amotivation) which does not reflect the shift in Deci and Ryan's (2008) theorising of SDT from the intrinsic-extrinsic distinction to one of autonomous verses controlled motivation. Thus, exploring the tenability of using different scoring protocols with the BRSQ provided an important contribution to the wider literature because it highlights statistical issues with modelling the motivation regulations in various ways and provides initial recommendations for researchers as to which scoring protocols are most appropriate to use with the BRSQ.

Based on the findings of study 1, it was recommended that the motivational regulations should either be modelled independently (as a 6-factor model), as a 4-factor model (intrinsic, autonomous extrinsic, controlled extrinsic, and amotivation), or as 3-factor model (autonomous, controlled extrinsic, and amotivation). Furthermore, the results suggest that researchers should cease to model the motivation regulations using 3-factor model which combines the 4 extrinsic motivations into a higher order factor (i.e., intrinsic, extrinsic, amotivation) as the fit of this model was found to be unacceptable. This configuration also does not reflect the autonomous verses controlled distinction favoured in SDT (Deci & Ryan, 2008). Although study 1 was conducted with dance populations, researchers utilising the BRSQ in sport contexts may also want to take into consideration the recommendations for modelling the motivation regulations.

Table 6.2

*Mean Scores (M) and Standard Deviations (SD) for Dancers and Athletes for each Subscale of the BRSQ. The Range of Responses for each Subscale is also provided for Dancers*

| | Dancers (study 1) | | Athletes (Lonsdale et al., 2008) | |
| | Recreational/ non-elite dancers | Vocational/ elite dancers | Non-elite athletes | Elite athletes |
| Motivation Type | M (SD)  Range Min-Max | M (SD)  Range Min-Max | M (SD) | M (SD) |
|---|---|---|---|---|
| Intrinsic | 6.55 (0.59) 4.00-7.00 | 6.32 (0.76) 3.00-7.00 | 6.31 (0.79) | 6.14 (0.92) |
| Integrated | 5.29 (1.25) 1.00-7.00 | 5.52 (1.09) 1.00-7.00 | 5.55 (0.94) | 5.55 (1.06) |
| Identified | 5.43 (1.09) 1.75-7.00 | 5.36 (1.11) 1.00-7.00 | 5.71 (0.93) | 5.52 (1.10) |
| Introjected | 2.14 (1.32) 1.00-6.50 | 2.75 (1.55) 1.00-7.00 | 3.00 (1.66) | 2.71 (1.60) |
| External | 1.58 (0.90) 1.00-5.75 | 1.88 (1.18) 1.00-7.00 | 2.57 (1.50) | 2.03 (1.21) |
| Amotivation | 1.58 (0.91) 1.00-5.75 | 2.29 (1.37) 1.00-7.00 | 2.42 (1.43) | 2.33 (1.36) |

Using the BRSQ, studies 1 and 2 found dancers' motivation regulations to generally be highly self-determined with mean scores on all autonomous subscales (intrinsic, integrated and identified) above the midpoint. Dancers reported low levels of controlled motivations (introjected and external) and amotivation with these three subscales falling below the mid-point. Recreational and vocational dancers' mean scores (in study 1) on each subscale of the BRSQ are similar to those of non-elite and elite athletes reported in Lonsdale et al. (2008) (see Table 6.2). Interestingly recreational dancers were found to have the highest level of intrinsic motivation and the lowest levels of amotivation when compared to vocational dancers and non-elite and elite athletes. These findings contribute to a particularly positive depiction of the quality of motivation in recreational dance contexts. It is important to note that there was a large amount of variability in dancers' responses observed in the case of both recreational and vocational dance populations. Hence, not all dancers were participating in dance for more autonomous reasons. This further highlights the importance of the findings of

study 2 which pointed to the social-psychological conditions which may predict more adaptive forms of motivation.

Building on study 1, study 2 employed the BRSQ to examine the mediating role of *each* motivation regulation between dancers' basic need satisfaction and need thwarting and their reported affective states. To date, only a few studies in physical education (e.g., Ntoumanis, 2001) and exercise settings (e.g., Edmunds, Ntoumanis, & Duda, 2006) and no studies in sport or dance contexts have examined the mediating role of each motivation regulation between basic need satisfaction and affective, behavioural and/or cognitive outcomes. Furthermore, to our knowledge, no research has tested mediation of the motivation regulations between experiences of basic need thwarting and any cognitive, behavioural or affective outcomes in any context. It is important to develop a greater understanding of how each qualitatively different reason for engagement may link the experience of basic need satisfaction/thwarting to affective outcomes. Such information can be used to aid the development of interventions that target the facilitation of specific types of motivation found to be more relevant to the prevalence of positive outcomes.

Study 2 found basic psychological need satisfaction to predict dancers' positive affect both directly and indirectly via the motivation regulations. Prior to the studies undertaken in this thesis, little was known regarding the role of motivation regulations in recreational dance as determinants of dancers' affective states. Findings revealed identified regulation to play a significant mediating role between dancers' need satisfaction and reported positive affect. The importance of identified regulation for engagement has also been recognised in previous research in exercise settings (Edmunds et al., 2006). Edmunds and colleagues (2006) suggest that valuing the associated benefits (e.g., improved fitness) is important for encouraging engagement in activities which may for some lack intrinsic appeal. Hence, this study

highlights that raising awareness of the value and benefits associated with dance (such as, increased fitness and the opportunity to make new friends) is important for the promotion of positive emotional experiences in recreational dance.

Study 2 was the first investigation (in any context) to examine the mediating role of the motivation regulations between individuals' basic need thwarting and positive and negative indicators of healthful functioning. The results suggest that basic need thwarting may operate differently to basic need satisfaction. More specifically, the motivational regulations did not mediate the relationship between dancers' basic need thwarting and reported negative affect. Instead dancers' experiences of basic need thwarting played a significant direct role in the prediction of affective states. This finding further reinforces the importance of examining basic need thwarting in order to explain, and ultimately prevent, maladaptive outcomes.

The non-significant mediating role of the motivation regulations between dancers' experiences of basic need thwarting and negative affect may be due to the non-significant or relatively weak relationships between dancers' motivation regulations and reported negative affect. It is important to note that study 3 employed a cross-sectional research design and therefore only captured a snap shot in time. The relationship between dancers' motivations for engagement and negative affect may be more dynamic and overtime a stronger relationship may emerge. For example, if a dancer is participating for external reasons (e.g., they dance in order to please a significant other), this may not instantly result in the dancer experiencing negative emotions whilst dancing. However, if the dancer's motivation remains external over time then this may lead him or her to experience more negative emotions at the contextual level. To address this hypothesis, future research employing a multi-wave longitudinal design is warranted.

**Practical Implications and Future Directions**

This thesis was comprised of a series of studies designed to address a number key conceptual and methodological issues related to the testing of SDT in dance contexts. The studies described within this thesis also aim to enhance current knowledge and understanding of motivational process in achievement contexts. It is hoped that such knowledge and understanding will contribute to the advancement of training environments which promote optimal functioning, motivation and well-being in dancers as well as other 'performers' in achievement settings (e.g., athletes, musicians). The findings of this thesis can be used to inform theoretically grounded interventions which aim to educate teachers as to how they can support dancers' optimal development and psychological well-being. Based on the findings of this thesis, such an education training programme could be based on the integration of SDT and AGT, such as described by Duda (2013). The training programme would cover *what* key social-environmental conditions may predict dancers' optimal motivation and engagement, illustrating the social-environment created in achievement settings to be multi-dimensional, and consist of empowering and disempowering facets. Furthermore, the training programme would cover *how*, the motivational processes via which, key dimensions of the social psychological environment created by significant others (such as, teachers) may predict variability in the quality of dancers' motivation and engagement; specifically focusing on the roles of the basic needs and motivation regulations. Examples of practical strategies dance teachers could use to become more empowering and less disempowering and how this may lead to the satisfaction/thwarting of dancers' basic psychological needs is detailed in Table 6.3.

The development, implementation, and evaluation of an intervention grounded in AGT and SDT would have significant implications for dance. At a recreational level such a

training programme would create a greater understanding of how to encourage long-term participation and enhanced psychological well-being. The Council for Dance Education and Training estimates that in the private dance sector alone, there are 16,500 registered dance teachers and a further 7,941 teachers in training, teaching in excess of 750,000 young people each week (ACE, 2009). If such a dance training programme became an integral part of dance teachers' mandatory training this would help to ensure quality dance education for all young people.

In order to push for a healthier dance culture, from recreational through to elite dance schools, programmes educating teachers how to create a more empowering climate in classes is essential. To create a cultural change throughout a school, such a programme could also be targeted at other key authority figures, such as the management, academic and pastoral care staff. In terms of connecting theory, research and practice, a considerable challenge is to identify how to effectively teach key authority figures (i.e., managers, directors, teachers) to become more empowering and less disempowering.

Investigation into the processes of behavioural change and the facilitators and barriers to authority figures accepting, implementing, and sustaining more empowering teaching practices would be an interesting area of future research. Research in exercise (Edmunds, Ntoumanis, & Duda, 2008) and academic (Reeve, 1998) contexts has demonstrated that it is possible to teach instructors to be more autonomy-supportive. However, Reeve (1998) pointed out that teacher's prior beliefs and attitudes about how best to motivate students, influences the extent to which they are willing to accept new ideas and strategies as to how to motivate students. For example, teachers have been found to generally only adopt strategies that they view as familiar (Kurita & Zarbatany, 1991) and plausible (Kazdin, 1981). Furthermore, cross-sectional research undertaken in the sport domain (Stebbings, Taylor, &

Spray, 2011; Stebbings, Taylor, Spray, & Ntoumanis, 2012) has highlighted the importance of the coaches' work environment (i.e., job security, opportunities for professional development, stable work-life balance) for influencing coaches' implementation of autonomy support and/or controlling behaviours.

Theory-based qualitative research drawing from various social-cognitive approaches (e.g., SDT, AGT, Self-efficacy Theory, Theory of Planned Behaviour) may provide insight into the barriers to becoming more empowering experienced by leaders in achievement contexts (e.g., dance, sport, exercise, physical education). For example, such research could employ a case study design and follow a small number of teachers though an education programme (such as that detailed in Duda, 2013). Gaining a comprehensive understanding of the teachers' experiences throughout the process, for example, how they respond to the education materials, what they think works and what does not, and how the theory-based ideas and strategies stemming from SDT and AGT can most effectively be implemented in the specific contexts in which the instructors work would be highly beneficial. Training instructors/teachers/coaches to become more empowering and less disempowering will only be worthwhile if the training and ideas conveyed are accepted by the instructors and the instructors are then given the support that they need in order to create and maintain a need supportive teaching atmosphere in the long-term.

Table 6.3

*Examples of Practical Strategies Dance Teachers Could use to become More Empowering and Less Disempowering and How This May*

*Lead to the Satisfaction/Thwarting of Dancers' Basic Psychological Needs.*

| Practical strategies for Dance Teachers | How does this influence dancers basic psychological needs? |
|---|---|
| **BE MORE Autonomy Supportive** | |
| Provide a rationale to explain why a rule exists or why certain aspects of a dance lesson, which may be considered less interesting by dancers (e.g., stretching), are useful and worth dancers' attention. | Enabling the development of dancers' inner endorsement of the activity supports dancers' sense of autonomy. If dancers understand why an activity is important then they are more likely to value it. |
| Give dancers choices and options. Ask for the dancers input into the lesson plan. What do they feel that they need to improve/work on? | Providing dancers with a sense of choice satisfies dancers' need for autonomy by allowing dancers' interests and preferences to guide their learning. Being the origin of their own behaviour gives dancers a sense of volition over their actions. Dancers' experience of relatedness may also be satisfied as the teacher is showing that they value dancers' opinions. |
| Take time to ask and listen to how dancers would like to do things. Give dancers time to work on a move/skill/problem in their own way. | Acknowledging and fostering dancers' own perspective allows a sense of congruence to develop between dancers' preference for learning and experiences within dance classes, thus fulfilling their need for autonomy. If dancers are able to learn in a way which works for them this most likely will result in increased feelings of competence. Furthermore, dancers' relatedness may also be satisfied as taking time to listen to dancers' shows that the teacher cares and values their opinion. |
| **BE MORE Socially Supportive** | |
| Show an interest in dancers as people. For example, ask them how their week has been? | Demonstrating an appreciation and interest in dancers as people facilitates dancers' sense of relatedness by making dancers' feel that they are valued, cared for, and respected by others. |
| Let dancers know that you are there for them and that they can come and talk to you if needed. | Developing a relationship characterised by sense of openness, warmth, and affection fulfils dancers need for relatedness. Giving dancers the volition to seek help if need may also satisfy dancers need for autonomy. |
| Listen openly to dancers and do not judge their personal feelings. | Encouraging affective expression and self-disclosure lets dancers know that they understood, thus making them feel that they belong. |

### BE MORE Task-involving

Emphasise self-referenced judgements of competence. For example, encourage dancers' to focus on working hard to improve on their performance and always doing their best.

When mastery and improvement are considered the criteria with which to judge competence then as long as the dancers are working hard and improving then they will feel their competent, regardless of their ability level.

Support all dancers equally. For example, by spreading your attention evenly across dancers and emphasising the unique role/contribution that all dancers make to the group.

Supports both dancers' need for competence and relatedness by making dancers feel that they are equally all capable and valued within their environment.

Encourage dancers to work co-operatively together and help each other improve.

Doing so will increase dancers feelings of competence through the support of others to help them to function effectively and achieve their goals. Dancers' sense of relatedness may also be fulfilled as working together with others will help them to feel more connected. Working co-operatively with others in a way which allows all members to contribute to the group may satisfy dancers' need for autonomy.

### BE LESS Controlling

Do not expect dancers' whole lives to centre on their dance participation. Intrusive monitoring and interference into other aspects of dancers' lives, such as, banning dancers from doing other sports or expecting them to prioritise their dance involvement over time with family and friends is excessively controlling. Respect that dancers may have other aspects of their lives that are also important to them.

Excessive personal control can compromise dancers' feelings of autonomy by restricting their ability to choose how they spend their free time doing activities which are in line with their inner needs and values. Dancers' relatedness may also be undermined if they perceive the teachers' controlling behaviour as uncaring.

Avoid using rewards or praise to secure dancers compliance. For example, try not to motivate dancers by promising to reward them if they do well.

Extrinsic incentives can foster external perceptions of control and undermine dancers' feelings of autonomy. Furthermore, low perceived competence can ensue when rewards and praise are used inappropriately and given non-contingently on performance. If teachers are perceived by dancers as an insincere and their attempt to control behaviour contrived then it could also have a negative impact upon the need for relatedness.

Do not overtly manipulate dancers by intimidating them into complying with set expectations or demands. For example, try not to shout at dancers and/or use say derogatory/embarrassing things to intimidate them into performing certain behaviours.

Such use of intimidation may leave dancers feeling humiliated and rejected for by their teacher, thus thwarting their need for relatedness. Manipulative teacher behaviour may also undermine athletes' perceptions of their own competence, making them question their ability to function effectively in the dance environment. Dancers may feel little choice but to relinquish their control and comply with advocated behaviours, thus thwarting their need for autonomy.

**BE LESS Ego-involving**

| | |
|---|---|
| Try not to create an environment characterised by rivalry in which dancers are encouraged to compare themselves against other dancers. | Dancers who focus on normative comparison when construing levels of competence may only feel competent when their performance is superior to that of others. As the performance of others is out of dancers' control, this may lead them to constantly question their competence. Such rivalry may cause feelings of jealousy and conflict between dances' thus undermining their sense of relatedness. |
| When giving feedback ensure that you are giving all dancers equal recognition. Try not to favour some dancers over than others. | Creating a hierarchy of unequal recognition may make dancers think that some dancers are considered better (more competent) than others, thus obstructing dancers need for competence. Dancers' relatedness may also be compromised if the hierarchy leads to some dancers being envious when others achieve success. |
| If dancers make mistakes, for example, getting a step wrong, try not to punish them for this. Emphasise that mistakes are part of learning. | Punishing dancers for mistakes may make them feel that they are not good enough and, thus, thwart dancers need for competence. Dancers may also feel rejected by the teacher thus actively undermining their need for relatedness. The basic need of autonomy may also be compromised if dancers feel pushed to behave/perform in certain ways. |

**Conclusion**

The overarching purpose of the present thesis was to make a meaningful contribution to the theoretical understanding and measurement of motivational processes in the dance context, as well as the wider SDT literature. Collectively, the findings of this thesis progress the measurement of key motivational constructs (i.e., the teacher-created social environment and motivation regulations) in terms of their application in dance settings. This thesis has provided evidence to support the potential utility of a number of sport-based measures (i.e., PMCSQ-2, BRSQ, CCBS, & PNTS) in dance contexts. The findings also highlight important theoretical and methodological considerations for researchers with regards to the more effective use of these measures (in particular the PMCSQ-2 and BRSQ) in dance as well as other achievement contexts. For example, this thesis has identified issues with regards to the relevance of the sub-dimensions of task- and ego-involving climates captured in the subscales of the PMCSQ-2 and the tenability of different scoring protocols employed with the BRSQ.

Taken in their totality, the findings enhance understanding of the motivational processes via which the teacher-created social environment, as a multi-dimensional construct, predicts dancers' affective outcomes. This thesis has shown that the motivational climate created by the teacher to play an essential role in explaining variability in dancers' quality of motivation and positive and negative emotional experiences. The results largely support the central features of the self-determination theory framework (Deci & Ryan, 2000) adapted to include Duda's (2013) conceptualisation of the multi-dimensional motivational climate and basic psychological need thwarting (as detailed in Bartholomew et al., 2011b). The findings of this thesis can be used to inform and substantiate the need for theoretically grounded interventions which aim to educate teachers as to how they can support dancers' optimal development and psychological well-being in a variety of dance settings. At a recreational

level, where participation rates are high (ACE, 2009), this research is timely as it builds a greater understanding of how to potentially encourage long-term engagement and enhanced psychological well-being in a broad population. At a vocational level, research comprising this thesis contributes towards promoting a healthier dance school culture by advancing understanding of how teachers can create training environments which enable vocational dancers to thrive and flourish on a daily basis.

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## APPENDIX 1: STUDY 1 (CHAPTER 2) MATERIALS

## Questionnaire

### Behavioral Regulations in Sport Questionnaire (Lonsdale et al., 2008)

*Below are some __reasons why people participate in dance__. Using the scale provided, please indicate how true each of the following statements is for __you__.*

| Q | I participate in dance… | Not at all True | | | Somewhat True | | | Very True |
|---|---|---|---|---|---|---|---|---|
| 1 | Because I enjoy it. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | Because it's a part of whom I am. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | Because it's an opportunity to just be who I am. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | Because I would feel ashamed if I quit. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | But the reasons why are not clear to me anymore. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6 | Because I would feel like a failure if I quit. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7 | But I wonder what the point is. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | Because dancing is an expression of who I am. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9 | Because the benefits of dance are important to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10 | Because if I don't other people will not be pleased with me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11 | Because I like it. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12 | Because I feel obligated to continue. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13 | But I question why I continue. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14 | Because I feel pressure from other people to dance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15 | Because people push me to dance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| Q | I participate in dance… | Not at all True | | | Somewhat True | | | Very True |
|---|---|---|---|---|---|---|---|---|
| 16 | Because it's fun. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17 | Because it teaches me self-discipline. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18 | Because I would feel guilty if I quit. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19 | Because I find it pleasurable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20 | Because I value the benefits of dance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21 | But I question why I am putting myself through this. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22 | Because it is a good way to learn things which could be useful to me in my life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23 | In order to satisfy people who want me to dance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24 | Because it allows me to live in a way that is true to my values. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**APPENDIX 2: STUDY 2 (CHAPTER 3) MATERIALS**

**Questionnaire**

**Health Care Climate Questionnaire (Williams et al., 1996)**

*Read each of the following items carefully and respond to each item in terms of what the* <u>*typical atmosphere in your dance group has been like over the past month.*</u> *Please indicate on the scale the degree to which you agree with the following statements.*

| Q | During the last month, in this dance group… | Strongly disagree | | Neutral | | Strongly agree |
|---|---|---|---|---|---|---|
| 1 | My teacher gives dancers choices and options. | 1 | 2 | 3 | 4 | 5 |
| 2 | My teacher encourages dancers to be open with them (the teacher). | 1 | 2 | 3 | 4 | 5 |
| 3 | When my teacher asks dancers to do something, he or she tries to explain why this would be good to do. | 1 | 2 | 3 | 4 | 5 |
| 4 | My teacher encourages dancers to ask questions. | 1 | 2 | 3 | 4 | 5 |
| 5 | My teacher answers dancers' questions fully and carefully. | 1 | 2 | 3 | 4 | 5 |
| 6 | My teacher listens to how dancers would like to do things. | 1 | 2 | 3 | 4 | 5 |
| 7 | My teacher tries to understand how dancers see things before suggesting a new way to do things | 1 | 2 | 3 | 4 | 5 |

**Controlling Coach Behaviors Scale (CCBS; Bartholomew et al., 2010)**

*Read each of the following items carefully and respond to each item in terms of what the* <u>*typical atmosphere in your dance group has been like over the past month.*</u> *Please indicate on the scale the degree to which you agree with the following statements.*

| Q | During the last month, in this dance group… | Strongly disagree | | Neutral | | Strongly agree |
|---|---|---|---|---|---|---|
| 1 | My teacher is less friendly with dancers if they don't make the effort to see things his or her way. | 1 | 2 | 3 | 4 | 5 |
| 2 | My teacher shouts at dancers in front of others to make them do certain things. | 1 | 2 | 3 | 4 | 5 |

| 3 | My teacher only uses rewards/praise so that dancers stay focused on tasks during class. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 4 | My teacher is less supportive of dancers when they are not performing well. | 1 | 2 | 3 | 4 | 5 |
| 5 | My teacher tries to control what dancers do during their free time. | 1 | 2 | 3 | 4 | 5 |
| 6 | My teacher threatens to punish dancers to keep them inline during class and rehearsals. | 1 | 2 | 3 | 4 | 5 |
| 7 | My teacher tries to motivate dancers by promising to reward them if they do well. | 1 | 2 | 3 | 4 | 5 |
| 8 | My teacher pays less attention to dancers if they have displeased him or her. | 1 | 2 | 3 | 4 | 5 |
| 9 | My teacher intimidates dancers into doing the things that he/she wants them to do. | 1 | 2 | 3 | 4 | 5 |
| 10 | My teacher tries to interfere in aspects of the dancers' lives outside of dancing. | 1 | 2 | 3 | 4 | 5 |
| 11 | My teacher mainly uses rewards/praise to make dancers complete all the tasks he or she sets during class. | 1 | 2 | 3 | 4 | 5 |
| 12 | My teacher is less accepting of dancers if they have disappointed him or her. | 1 | 2 | 3 | 4 | 5 |
| 13 | My teacher embarrasses dancers in front of others if they do not do the things he/she wants them to do. | 1 | 2 | 3 | 4 | 5 |
| 14 | My teacher only rewards/praises dancers to make them work harder. | 1 | 2 | 3 | 4 | 5 |
| 15 | My teacher expects dancers' whole life to centre on their dance participation. | 1 | 2 | 3 | 4 | 5 |

**Autonomy Satisfaction Items (Deci et al., 2001)**

*The following questions relate to your <u>experiences in your dance group</u>. Respond to each question, by circling the answer which best describes how you have felt when participating in your dance group <u>over the past month</u>.*

| Q | During the last month, in this dance group I felt… | Strongly disagree | | | Neutral | | | Strongly agree |
|---|---|---|---|---|---|---|---|---|
| 1 | Free to express my ideas and opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| 2 | Free to do things my own way. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 3 | I could give a lot of input into deciding what skills/movements/expressions I wanted to practise. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | I had the opportunity to take part in deciding what choreography was used. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | I had a say in what happened in dance classes and rehearsals and I felt free to give my opinion. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6 | I had a lot of input in deciding how class and rehearsals were carried out. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Perceived competence subscale of the Intrinsic Motivation Inventory (McAuley et al., 1989)**

*The following questions relate to your experiences in your dance group. Respond to each question, by circling the answer which best describes how you have felt when participating in your dance group over the past month.*

| Q | During the last month, in this dance group I felt… | Strongly disagree | | | Neutral | | | Strongly agree |
|---|---|---|---|---|---|---|---|---|
| 1 | I was pretty good at dance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | Satisfied with my dancing. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | After practising a particular routine/movement for a while, I felt pretty competent. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | I was pretty skilled at dance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | I couldn't dance very well. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Acceptance subscale of the Need for Relatedness Scale (Richer & Vallerand, 1998)**

*The following questions relate to your experiences in your dance group. Respond to each question, by circling the answer which best describes how you have felt when participating in your dance group over the past month.*

| Q | During the last month, in this dance group I felt… | Strongly disagree | | | Neutral | | | Strongly agree |
|---|---|---|---|---|---|---|---|---|
| 1 | People supported me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | People listened to my opinions. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | People understood me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | People valued me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | Safe. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Psychological Need Thwarting Scale (PNTS; Bartholomew, et al., 2011b).**

*The following questions relate to your <u>experiences in your dance group</u>. Respond to each question, by circling the answer which best describes how you have felt when participating in your dance group <u>over the past month</u>.*

| Q | During the last month, in this dance group I felt… | Strongly disagree | | | Neutral | | | Strongly agree |
|---|---|---|---|---|---|---|---|---|
| 1 | Prevented from making choices with regard to the way I practised dance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | There were situations where I was made to feel inadequate. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | Pushed to behave in certain ways. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | Rejected by those around me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | Forced to follow training decisions made for me by teachers. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6 | Inadequate because I was not given opportunities to fulfil my potential. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7 | Under pressure to agree with the dance schedule I was provided with. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | Others were dismissive of me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9 | Situations occurred in which I was made to feel incapable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| 10 | Other people disliked me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 11 | There were times when I was told things that made me feel incompetent. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12 | Other people were envious when I achieved success. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**Behavioral Regulations in Sport Questionnaire (Lonsdale et al., 2008)**

*Below are some **reasons why people participate in dance**. Using the scale provided, please indicate how true each of the following statements is for **you**.*

| Q | I participate in this dance group… | Not at all True | | | Somewhat True | | | Very True |
|---|---|---|---|---|---|---|---|---|
| 1 | Because I enjoy it. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | Because it's a part of whom I am. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | Because it's an opportunity to just be who I am. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | Because I would feel ashamed if I quit. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | But the reasons why are not clear to me anymore. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 6 | Because I would feel like a failure if I quit. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 7 | But I wonder what the point is. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | Because dancing is an expression of who I am. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9 | Because the benefits of dance are important to me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10 | Because if I don't other people will not be pleased with me. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11 | Because I like it. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12 | Because I feel obligated to continue. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13 | But I question why I continue. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| 14 | Because I feel pressure from other people to dance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 15 | Because people push me to dance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16 | Because it's fun. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17 | Because it teaches me self-discipline. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18 | Because I would feel guilty if I quit. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19 | Because I find it pleasurable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20 | Because I value the benefits of dance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21 | But I question why I am putting myself through this. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 22 | Because it is a good way to learn things which could be useful to me in my life. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 23 | In order to satisfy people who want me to dance. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 24 | Because it allows me to live in a way that is true to my values. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

**The Positive and Negative Affect Scale (Watson, Clark, & Tellegen, 1988)**

This scale consists of a number of words that describe different feelings and emotions. Read each item and then using the scale provided indicate to what extent you have felt this way when dancing with your group, <u>over the past month</u>.

| Q | **"During the last month, when I was dancing with this group, I generally felt..."** | Not at all | | | Moderately | | | Extremely |
|---|---|---|---|---|---|---|---|---|
| 1 | Interested. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 2 | Distressed. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 3 | Excited. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 4 | Upset. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 5 | Strong. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

| 6 | Guilty. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|---|
| 7 | Scared. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 8 | Hostile. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 9 | Enthusiastic. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 10 | Proud. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 11 | Irritable. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 12 | Alert. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 13 | Ashamed. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 14 | Inspired. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 15 | Nervous. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 16 | Determined. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 17 | Attentive. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 18 | Jittery. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 19 | Active. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 20 | Afraid. | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

## APPENDIX 3: STUDY 3 (CHAPTER 4) MATERIALS

## Think Aloud Instructions

In this study we are interested in what you are thinking about when you are filling in the questionnaire I am about to give you. In a moment, I am going to ask you to think out loud as you work through the questionnaire.

What I mean by 'think out loud' is that I want you to tell me everything you are thinking from the time you first see the questionnaire until you have answered all the questions. I would like you to talk out loud the whole time you are filling in the questionnaire.

I don't want you to plan out what you are going to say or to try to explain to me what you are saying. Just act as if you are alone in the room talking to yourself. There is no right or wrong way to think. What is important is that you honestly say what goes on in your mind as you read through the questionnaires instructions and questions. For example, what is the questionnaire trying to ask you? Do you understand the questions? Are there any words which don't make sense to you?

It is important that you keep talking. If you are silent for any long period of time, I will ask you to talk. Please try to speak as clearly as possible, as I shall be recording you as you speak.

Do you understand what I want you to do?

Here is a practice so that you can have a go.

**Warm-up Task**

This is a chance for you to practice thinking aloud. Please answer the below questions whilst verbalizing your thought process.

- Please answer all the questions as honestly and carefully as possible.
- There are no right or wrong answers so please answer as you truly feel.
- Please circle the appropriate answer to indicate how much you agree or disagree with each question.

**Example**
For question 1, if you strongly agree, put a circle around number 5.

| Q | In this dance school/company/group… | Strongly disagree | | Neutral | | Strongly agree |
|---|---|---|---|---|---|---|
| 1 | I feel that my teachers provide me with choices and options. | 1 | 2 | 3 | 4 | 5 |
| 2 | I am able to be open with my teachers while engaged in dance. | 1 | 2 | 3 | 4 | 5 |
| 3 | My teachers make sure I really understand the goals of my dance involvement and what I need to do. | 1 | 2 | 3 | 4 | 5 |
| 4 | My teachers encourage me to ask questions. | 1 | 2 | 3 | 4 | 5 |
| 5 | My teachers answer my questions fully and carefully. | 1 | 2 | 3 | 4 | 5 |

## Questionnaire

**Perceived Motivational Climate in Sport Questionnaire-2 (Newton et al., 2000)**

*Read each of the following items carefully and respond to each item in terms of how you view the <u>typical atmosphere in your dance school, company or group.</u> Please answer the below questions whilst verbalizing your thought process.*

| Q | In this dance school/company/group… | Strongly disagree | | Neutral | | Strongly agree |
|---|---|---|---|---|---|---|
| 1 | The teachers give most of their attention to the "stars". | 1 | 2 | 3 | 4 | 5 |
| 2 | Each dancer contributes in some important way. | 1 | 2 | 3 | 4 | 5 |
| 3 | The teachers believe that all of us are crucial to the success of a performance. | 1 | 2 | 3 | 4 | 5 |
| 4 | The teachers praise dancers only when they outperform other dancers. | 1 | 2 | 3 | 4 | 5 |
| 5 | The teachers think that only the lead dancers contribute to the success of a performance. | 1 | 2 | 3 | 4 | 5 |
| 6 | Dancers feel good when they try their best. | 1 | 2 | 3 | 4 | 5 |
| 7 | Dancers are not selected for the best roles if they make mistakes. | 1 | 2 | 3 | 4 | 5 |
| 8 | Dancers at all skill levels have an important role in performances. | 1 | 2 | 3 | 4 | 5 |
| 9 | Dancers help each other learn. | 1 | 2 | 3 | 4 | 5 |
| 10 | Dancers are encouraged to outperform the other dancers. | 1 | 2 | 3 | 4 | 5 |
| 11 | The teachers have their own favourites. | 1 | 2 | 3 | 4 | 5 |
| 12 | The teachers make sure dancers improve on skills or movements they're not good at. | 1 | 2 | 3 | 4 | 5 |
| 13 | The teachers yell at dancers for messing up. | 1 | 2 | 3 | 4 | 5 |
| 14 | Dancers feel successful when they improve. | 1 | 2 | 3 | 4 | 5 |
| 15 | Only the best dancers get praise. | 1 | 2 | 3 | 4 | 5 |

| Q | In this dance school/company/group… | Strongly disagree | | Neutral | | Strongly agree |
|---|---|---|---|---|---|---|
| 16 | Dancers are punished when they make a mistake. | 1 | 2 | 3 | 4 | 5 |
| 17 | Each dancer has an important role. | 1 | 2 | 3 | 4 | 5 |
| 18 | Trying hard is rewarded in rehearsals and performances. | 1 | 2 | 3 | 4 | 5 |
| 19 | The teachers encourage dancers to help each other. | 1 | 2 | 3 | 4 | 5 |
| 20 | The teachers make it clear who they think are the best dancers. | 1 | 2 | 3 | 4 | 5 |
| 21 | Dancers are "fired up" (positively excited) when they perform better than their fellow dancers in a performance. | 1 | 2 | 3 | 4 | 5 |
| 22 | If you want to be cast for the best roles you must be one of the best dancers. | 1 | 2 | 3 | 4 | 5 |
| 23 | The teachers emphasise always trying your best. | 1 | 2 | 3 | 4 | 5 |
| 24 | Only the top dancers "get noticed" by the teachers. | 1 | 2 | 3 | 4 | 5 |
| 25 | Dancers are afraid to make mistakes. | 1 | 2 | 3 | 4 | 5 |
| 26 | Dancers are encouraged to work on their weaknesses. | 1 | 2 | 3 | 4 | 5 |
| 27 | The teachers favour some dancers more than others. | 1 | 2 | 3 | 4 | 5 |
| 28 | The focus is to improve each class /rehearsal /performance. | 1 | 2 | 3 | 4 | 5 |
| 29 | The dancers really "work together" as a team when it comes to performances. | 1 | 2 | 3 | 4 | 5 |
| 30 | Each dancer feels as if they are an important team member. | 1 | 2 | 3 | 4 | 5 |
| 31 | The dancers help each other to get better and excel. | 1 | 2 | 3 | 4 | 5 |
| 32 | The teachers want us to try new skills/movements/expressions. | 1 | 2 | 3 | 4 | 5 |
| 33 | The teachers get mad when a dancer makes a mistake. | 1 | 2 | 3 | 4 | 5 |

**APPENDIX 4: STUDY 4 (CHAPTER 5) MATERIALS**

**Diary**

**SECTION A: PLEASE FILL THIS SECTION IN IMMEDIATELY BEFORE CLASS**

What day is it today? ………………….

The class I am about to take is? ........................................................................

This class is due to start at…………………… and finish at……………………

What is the time right now? ……………………..

**Short form Positive and Negative Affect Schedule (PANAS; MacKinnon et al., 1999)**

*How you feel – These are words that describe different feelings and emotions. Read each item and then indicate to what extent you feel this way RIGHT NOW/at THIS MOMENT.*

| Q | I feel… | Not at all | A Little | Moderately | Quite a bit | Extremely |
|---|---------|------------|----------|------------|-------------|-----------|
| **1** | Distressed. | 1 | 2 | 3 | 4 | 5 |
| **2** | Excited. | 1 | 2 | 3 | 4 | 5 |
| **3** | Upset. | 1 | 2 | 3 | 4 | 5 |
| **4** | Scared. | 1 | 2 | 3 | 4 | 5 |
| **5** | Enthusiastic. | 1 | 2 | 3 | 4 | 5 |
| **6** | Alert. | 1 | 2 | 3 | 4 | 5 |
| **7** | Inspired. | 1 | 2 | 3 | 4 | 5 |
| **8** | Nervous. | 1 | 2 | 3 | 4 | 5 |
| **9** | Determined. | 1 | 2 | 3 | 4 | 5 |
| **10** | Afraid. | 1 | 2 | 3 | 4 | 5 |

**SECTION B: PLEASE FILL THIS SECTION IN IMMEDIATELY AFTER CLASS**

What day is it today? ……………………

Time that class finished: ………………    What is the time now? ……………………

**1 items per subscale selected from the multi-dimensional measure of the motivational climate (MMCSQ; Appleton, Ntoumanis, Quested, & Duda, 2013).**

*Please respond to the following items, thinking about how you felt in the class you have just attended:*

| Q | In this class… | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|---|---|
| **1** | My teacher gave dancers choices and options. | 1 | 2 | 3 | 4 | 5 |
| **2** | My teacher shouted at dancers in front of others to make them do certain things. | 1 | 2 | 3 | 4 | 5 |
| **3** | My teacher listened openly and did not judge dancers' personal feelings. | 1 | 2 | 3 | 4 | 5 |
| **4** | My teacher acknowledged dancers who tried hard. | 1 | 2 | 3 | 4 | 5 |
| **5** | My teacher had his or her favourite dancers. | 1 | 2 | 3 | 4 | 5 |

**Basic Psychological Need Satisfaction/Thwarting**.

Basic Need Satisfaction - 3 items, one from each of the following measures; the autonomy scale (Deci et al., 2001), the competence subscale from the Intrinsic Motivation Inventory (McAuley, Duncan, & Tammen, 2006), and the acceptance subscale from the Need for Relatedness Scale (Richer & Vallerand, 1998). Basic Psychological Need Thwarting **-** 3 items from the Psychological Need Thwarting Scale (Bartholomew et al., 2011b).

*Please respond to the following items, thinking about how you felt in the class you have just attended:*

| Q | In this class… | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|---|---|---|---|---|---|---|
| **1** | I felt I was satisfied with my dancing | 1 | 2 | 3 | 4 | 5 |
| **2** | I felt there were situations where I was made to feel inadequate. | 1 | 2 | 3 | 4 | 5 |

| 3 | I felt people valued me. | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|---|
| 4 | I felt pushed to behave in certain ways. | 1 | 2 | 3 | 4 | 5 |
| 5 | I felt rejected by those around me. | 1 | 2 | 3 | 4 | 5 |
| 6 | I felt free to express my ideas and opinions. | 1 | 2 | 3 | 4 | 5 |

**Short form Positive and Negative Affect Schedule (PANAS; MacKinnon et al., 1999)**

*How you feel – These are words that describe different feelings and emotions. Read each item and then indicate to what extent <u>you feel this way RIGHT NOW/at THIS MOMENT.</u>*

| Q | I feel… | Not at all | A Little | Moderately | Quite a bit | Extremely |
|---|---|---|---|---|---|---|
| 1 | Distressed. | 1 | 2 | 3 | 4 | 5 |
| 2 | Excited. | 1 | 2 | 3 | 4 | 5 |
| 3 | Upset. | 1 | 2 | 3 | 4 | 5 |
| 4 | Scared. | 1 | 2 | 3 | 4 | 5 |
| 5 | Enthusiastic. | 1 | 2 | 3 | 4 | 5 |
| 6 | Alert. | 1 | 2 | 3 | 4 | 5 |
| 7 | Inspired. | 1 | 2 | 3 | 4 | 5 |
| 8 | Nervous. | 1 | 2 | 3 | 4 | 5 |
| 9 | Determined. | 1 | 2 | 3 | 4 | 5 |
| 10 | Afraid. | 1 | 2 | 3 | 4 | 5 |