Running head: DAILY FLUCTUATIONS IN THE AFFECTIVE STATES OF DANCERS

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Daily Fluctuations in the Affective States of Dancers: A Cross-Situational Test of Basic Needs Theory

Abstract

Objectives: This study tested the generalizability of basic needs theory (BNT; Deci & Ryan, 2000) across situations in which dancers learn and perform within vocational dance. Specifically, we examined the inter-relationships between daily and typical perceptions of autonomy support, basic psychological need satisfaction, and changes in affective states, across dance situations that were divergent in their learning and evaluative potential (dance classes, rehearsals, and performances). Genre differences were also examined.

Design: A one-month diary study examined the inter-relationships between typical and daily perceptions of autonomy support, basic psychological need satisfaction and positive and negative affect among dancers studying three distinct genres and in three situations (classes, rehearsals, performances).

Method: Fifty-five dancers completed a series of scales tapping the variables of interest. Abbreviated versions of the scales were completed before (affective states) and after (affective states, basic needs and autonomy support) dance classes, rehearsals and performances over four weeks. Analyses tested the BNT sequence across the learning and performance situations. Interactions between typical and state experiences were tested. Cross-genre comparisons were also made.

Results: Results partially supported the BNT sequence across classes, rehearsals and performances. There were situational differences in the salience of each need as a predictor of affective states. When comparing genres, some differences were also found in perceived autonomy support, basic need satisfaction and affective states.

Conclusions: Findings point to the importance of promoting autonomy supportive dance teaching to facilitate dancers' day-to-day experiences of well-being.

Key words: Basic needs, autonomy, competence, relatedness, autonomy support, dance

Daily Fluctuations in the Affective States of Dancers: A Cross-Situational Test of Basic Needs Theory

In the setting of vocational dance, students train for approximately nine hours per day, five or six days per week. Despite the potential repetition of the daily routine, fluctuation in the extent to which a dancer feels he/she 'has had a good day' or a 'bad day' is inevitable. This variability may have implications for dancers' long-term health and well-being.

Grounded in self-determination theory (Deci & Ryan, 1985, 2000), numerous studies have examined the psychological mechanisms predictive of *between-person* variability in subjective well-being (Ryan & Deci, 2001). This work has been undertaken in performance-related settings such as education (Vansteenkiste, Lens, Soenens, & Luyckx, 2006), sport (Adie, Duda & Ntoumanis, 2008), and more recently, vocational dance (Quested & Duda, 2010). Less is known regarding the psychological processes that may account for *within-person* day-to-day fluctuations in well-being in any setting. Examining the predictors of daily peaks and troughs in well- and ill-being is an important step in delineating the antecedents of optimized and sustained psychological health.

Determinants of Optimal Functioning: A Self-determination Theory Perspective

Self-determination theory (SDT; Deci & Ryan, 1985, 2000) has been applied to help explain why one person may be functioning more or less optimally on any one day (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). SDT postulates three basic needs as key psychological mechanisms underpinning the 'social environment – well-being' relationship. Specifically, the needs for autonomy, competence and relatedness are considered to be essential nutriments for well-being (Ryan, 1995). According to the SDT's Basic Needs mini-Theory (BNT) (Deci & Ryan, 2000), the need for autonomy is satisfied when one engages in activities that are self-selected, self-regulated and personally endorsed (DeCharms, 1968). Competence need fulfillment results from feelings that one possesses the behavioral

capability and efficacy to carry out targeted actions (White, 1959). Lastly, to feel cared for and a sense of belongingness is reflective of relatedness need satisfaction (Baumeister & Leary, 1995). The universality hypothesis, central to BNT (Ryan & Deci, 2002), predicts that basic need satisfaction is a universal need, regardless of culture, context and situation.

As a meta-theory of human behavior, SDT recognizes that need fulfillment does not occur automatically; numerous studies have identified variability in the degree of basic psychological need satisfaction experienced (Ryan & Deci, 2002). For human beings to realize their potential, function optimally, and be 'well', the social environment must provide conditions that will cultivate basic psychological need satisfaction (Deci & Ryan, 2000). The degree of autonomy support provided by social agents is one social-environmental variable that is often hypothesized to have implications for basic psychological need satisfaction. When leaders create so-called 'autonomy supportive' climates (Black & Deci, 2000; Reeve, Bolt, & Cai, 1999), they are empathetic and promote volition and choice. Studies undertaken in sport (Adie, Duda, & Ntoumanis, 2008), exercise (Edmunds, Ntoumanis, & Duda, 2006), physical education (Ntoumanis, 2001) and vocational dance (Quested & Duda, 2010) settings have examined between-person associations between perceptions of autonomy support, basic psychological need satisfaction and ensuing health-related consequences. These investigations have tended to find that typical perceptions of autonomy support provided by coaches, teachers or instructors to positively relate to basic psychological need satisfaction and, indirectly, to indices of well-being and optimal functioning among those engaged in these different physical activity-related situations.

In terms of the potential day-to-day impact of the social environment on the satisfaction of basic needs, less is known. Reis and colleagues (2000) identified that the nature of students' social experiences (e.g., doing fun things, hanging out with others, feeling self-conscious) was associated with the degree of basic psychological need satisfaction and

well-being afforded each day (Reis et al., 2000). However, the implications of within-person variability in perceptions of the social environment, such as the degree of autonomy support created by significant others, have largely been neglected in BNT-based diary studies. From a pedagogical perspective, it is important to also target specific teacher behaviors that may facilitate versus forestall basic psychological need satisfaction each day among those engaged in the learning setting in question. In a recent diary study undertaken in athletic settings, Bartholomew et al (2011) found athletes' experiences of autonomy support during training to be a strong predictor of that days' basic need satisfaction. Changes in positive affect (but not negative affect) during training were predicted by need satisfaction experienced during training.

Perceived Autonomy Support, Basic Psychological Need Satisfaction and Different Dance Genres

Within vocational dance, dancers usually specialize in a particular genre. While ballet environments are typically regarded as authoritarian and controlled (Aalten, 2005), the contemporary genre is typified by freedom, personal expressiveness and exploration. Thus, the first major purpose of this study was to test the BNT hypothesis with respect to the dancers' major genre of study. To address this aim, we compared daily levels of perceived autonomy support, basic psychological need satisfaction and reported affective states between dancers partaking in classes in three genres that vary in terms of the structure and degree of individual input. In addition to ballet and contemporary, we also targeted Chinese dance. This genre stems from a traditional heritage that has developed over hundreds of years and is typified by ritual and a specific movement vocabulary and technique, with minimal personal expressiveness and novelty. We hypothesized that dancers engaged in ballet and Chinese dance classes would report lower perceptions of autonomy support and BPNS after classes than their contemporary dance counterparts.

BPNS and Day to Day Experiences in Learning and Performance Settings

Dance training classes represent one salient setting in the daily educational experiences of a vocational dancer. To date, the universality hypothesis, central to BNT (Ryan & Deci, 2002), has not been tested across learning and more evaluative performance-related situations, in which there may be variability in the salience of social-environmental cues and the potential for basic need satisfaction. Cross-sectional research (e.g., Quested & Duda, 2010), in which dancers are asked to consider the 'typical' environment manifested in their dance school, precludes the possibility of delineating between the motivational atmospheres created in different achievement-related situations, such as (in the context of dance) the more evaluative settings of rehearsals and performances. SDT hypothesizes that the basic needs are essential for optimal human functioning and well-being regardless of culture or context (Ryan & Deci, 2002). Therefore, using a diary methodology and in the context of vocational dance, our second aim was to examine BNT across three situations in one context (Vallerand, 1997). Specifically, in the context of vocational dance schools, we explored whether the inter-relationships between perceptions of autonomy support, basic psychological need satisfaction, and changes in affective states, varied across dance situations that were divergent in their learning and evaluative potential (dance classes, rehearsals, and performances). We chose to focus our investigation on these different situations within the vocational dance context as they vary with respect to function (i.e., learning, practicing, performing) and as such, are likely to provide different degrees of opportunity to feel a sense of autonomy, competence and relatedness. Extending the work of Bartholomew et al (2011) whose analysis centered on a composite needs variable, we tested the presumed universal BNT sequence 'autonomy support – basic psychological need satisfaction - well-being' (Deci & Ryan, 2000; Ryan & Deci, 2002) with the needs represented separately, in three targeted settings. In past cross-sectional research in sport and vocational dance, respectively, there has

been only partial support that the needs individually contribute to athletes' and dancers' well-being (Adie et al., 2008; Quested & Duda, 2010). Specifically, in Quested and Duda's (2010) study, autonomy need satisfaction was unrelated to the affective states dancers typically experienced. In their investigation, Adie et al. (2008) found competence need satisfaction to be unrelated to athletes' reported emotional and physical exhaustion. In both studies, there were also differences in the strength of the relationships between perceived autonomy support and the three needs, and between these needs and the targeted outcome variables. These authors have explained their findings by suggesting that the importance of the different needs in predicting affective states may be dependent on need "salience" within a specific setting. In the present study, we were able to explore this possibility by examining the inter-relationships between each basic need and affective states in three situations (class, rehearsal and performance) and across three dance genres (ballet, contemporary and Chinese).

Perceptions of autonomy support (measured after classes, rehearsals and performances) were hypothesized to positively predict post-event ratings of autonomy, competence and relatedness, across the different settings. Changes in positive affect and negative affect during the event were expected to be related to perceptions of autonomy support and need satisfaction (positively and negatively, respectively) in all three situations. Based on the "need salience" argument, we anticipated competence to be a stronger predictor of affective states in the more competence-focused rehearsal and performance settings, whereas autonomy and relatedness were expected to be equally salient predictors of changes in affective states experienced during classes.

Typical and Daily Experiences of Autonomy Support and BPNS

Past work has pointed to the importance of considering determinants of person- *and* state-level fluctuations in daily well-being (Reis et al., 2000). Bartholomew et al (2011) revealed daily experiences of basic need satisfaction in training settings to be enhanced when

athletes generally perceived their coaches to be autonomy supportive. However, general experiences of basic psychological need satisfaction in the sport or dance setting could also be an important determinant of daily changes in affective states. This implies a multilevel extension of SDT, which has recently been examined in the contexts of work settings (Liu, Chen, & Yao, 2011; Liu & Fu, 2011), relationships (Patrick, Knee, Canevello, & Lonsbary, 2007) and sport (Gaudreau, Fecteau, & Perreault, 2010; Bartholomew et al., 2011). For example, (Moller, Deci, & Elliot, 2010) revealed that individuals with low-level person relatedness tend to experience lower general positive affect, and also lower positive affect at the event (or state) level. In past cross-sectional work in dance, Quested and Duda (2010) suggested that 'the norm' of low autonomy in dance settings (particularly implicating ballet) may explicate the non-significant relationship between autonomy need satisfaction and dancers' experiences of negative affect. The authors' argument centered on the point that if low autonomy has traditionally been the norm in classes, feelings of low autonomy may be less likely to impact upon the dancers' experiences of negative affective states when measured at one point in time. Nevertheless, BNT would predict that optimal functioning would be forestalled among these dancers over time. Thus, as a third major aim, we examined whether the general degree of autonomy support as well as dancers' general degree of autonomy, competence and relatedness satisfaction experienced in their school (termed "typical level" throughout this paper) contributed towards changes in the dancers' daily experiences of affective states in each class (and also in the more evaluative settings of rehearsal and performance), over and above their daily experiences of autonomy support and basic psychological need satisfaction. We also tested a series of cross-level interactions between typical and daily experiences of autonomy support and BPNS to examine whether the cross-level interactions were significant in predicting changes in affective states during dance classes.

We hypothesized that perceptions of the typical levels of autonomy support offered and typical BPNS experienced in school would be positively associated with changes in positive affect and negatively associated with changes in negative affect during the classes, rehearsal and performances. However, we expected state level perceptions of autonomy support and basic psychological need satisfaction to explain the most variance in changes in the dancers' daily affective states. With regard to the cross-level interactions, we hypothesized that when dancers typically were high in perceptions of autonomy support and satisfaction of basic needs in school, they would be more likely to experience decreases in positive affect and increases in negative affect during class, when daily autonomy support and experienced need satisfaction were low. However, we also anticipated that in the case in which autonomy support and basic needs were typically low, dancers would be more likely to experience increases in positive affect and decreases in negative affect when these variables were high on a daily basis.

Methods

Participants

Fifty five vocational dancers (9 male, 41 female, 5 gender unspecified, M_{age} = 20.58 years, *SD* = 2.59) were recruited from an elite dance conservatoire in Hong Kong. Thirty eight percent of the dancers were specializing in ballet, 43.1% in contemporary, and 13.8% studied Chinese dance as their primary genre. On average, the dancers had been at the school for 2.29 years (*SD* = 1.15) and had been dancing since they were 9.30 years old (*SD* = 5.44).

Procedure

This study was approved by the departmental ethical review board at a large UK University. The dancers were informed that participation was voluntary, that their anonymity would be retained throughout and that they were free to withdraw from the study at any point. Dancers who wished to participate completed and returned consent forms. At this point in

time, the dancers completed the initial questionnaires (person-level measures) in a dance studio and under the supervision of the primary researcher.

The dancers collected diary booklets from the primary researcher on a weekly basis. Each booklet contained sufficient sections for the dancers to complete diary entries immediately before and after every *daily technique class* undertaken in their major genre for a period of four consecutive weeks. Dancers were asked to report the date and time that each entry was completed. At the end of each week, dancers placed the completed diaries in a secure 'drop box'. The diaries were completed anonymously; the dancers were asked to create an easily memorable personal code (based on their date of birth and number of siblings) and this code was used to match up the data. Compliance to the diary completion protocol was variable. The number of class diaries completed per participant ranged between five and twenty one. The median number of completed entries was fifteen. Altogether, 792 class diary entries were completed. The ratios of participants to days to variables were favorable when compared with other studies employing a diary methodology (Gagne, Ryan, & Bargmann, 2003).

Of the main sample, forty-two dancers (8 male, 31 female, 3 gender unspecified M_{age} = 21.23 years, *SD* = 2.47) also completed diary entries before and after *daily rehearsals* during the first two weeks of the study. The number of rehearsal diaries completed per person ranged between five and ten (median = 5), resulting in a total of 380 rehearsal entries. These dancers also completed diary entries before and after four *group performances* at the end of the second week. Dancers performed in a large theatre in front of a live audience.

Person-Level Measures

All written materials were translated from English into Chinese by a researcher in the field whose first language is Chinese. The Chinese versions were back translated into English by a second academic whose first language is Chinese. The primary investigator evaluated

the accuracy of the back translation. Any discrepancies between the two versions were discussed with the back translator and a solution was agreed upon. Dancers had the option of using English or Chinese versions of the study materials. Five dancers selected to complete the English versions of the materials. The initial multi-section questionnaire was completed one week prior to the start of the diary data collection. Dancers supplied some personal information including their age, gender, how many years they had been dancing and their major genre of study. In reference to their prevailing experiences in their school over the past few weeks, the dancers completed the following measures:

Autonomy support. Seven items (e.g., "My teachers encourage me to ask questions") adapted from the Health Care Climate Questionnaire (Williams, Grow, Freedman, Ryan, & Deci, 1996) measured the dancers' perceptions of the degree of autonomy support provided in their vocational dance school. Dancers were asked to respond to the items thinking about the typical environment manifested in their school over the past few weeks. Items followed the stem "In this dance school…" and were gauged on a scale from one (*strongly disagree*) to seven (*strongly agree*). The modified 7-item scale has demonstrated acceptable factorial validity and reliability in past research involving vocational dance students (Quested & Duda, 2010). Internal reliability in the present data set was high (a = .91).

Basic need satisfaction. The dancers were asked to think about how they felt when participating in dance at their school "over the past few weeks" when responding to the three BPNS subscales. Six items (e.g., "I feel free to express my ideas and opinions") gauged on a scale of one (*not at all true*) to seven (*very true*) tapped satisfaction of the need for autonomy (Deci et al., 2001). The validity and reliability of the autonomy need satisfaction measure has been supported in past research with athletes (Reinboth & Duda, 2006). The 5-item acceptance subscale from the Need for Relatedness Scale (Richer & Vallerand, 1998) was used to tap relatedness need satisfaction. A Likert scale ranging from one (*strongly disagree*)

to five (*strongly agree*) accompanied the items (e.g., "I feel understood"). The perceived competence subscale from the Intrinsic Motivation Inventory (McAuley, Duncan, & Tammen, 1989) assessed the dancers' perceived competence. Dancers responded to the five items (e.g., "I am satisfied with my dancing") on a scale of one (*strongly disagree*) to seven (*strongly agree*). The reliability and validity of the scales tapping competence and relatedness need satisfaction have been demonstrated in recent studies involving British vocational dancers (Quested & Duda, 2010). The three basic need subscales demonstrated good internal reliability in the present study (Autonomy a = .85, Competence a = .84, Relatedness a = .89).

Affective states. A measure of positive and negative affect (PANAS) (Watson, Clark, & Tellegen, 1988) was employed to tap the dancers' positive and negative affective states experienced "over the past few weeks". The twenty items tapping positive affect (e.g., "enthusiastic") and negative affect (e.g., "afraid") followed the stem "I have generally felt…". The validity and reliability of the PANAS have been demonstrated in previous studies in the dance domain (Quested & Duda, 2009a, 2010). The internal reliability estimates were high for the positive (a =.84) and negative affect subscales (a =.89).

Diary Measures

Diaries were made up of selected items from the initial questionnaire to measure autonomy support, autonomy, competence and relatedness satisfaction, as well as positive and negative affect. Before each class, rehearsal and performance, dancers responded to ten items tapping their affective states "at this moment in time/right now", on a scale one (*not at all*) to five (*extremely*) scale. The ten items followed the stem "I feel…". The factorial validity of this shortened version of the PANAS has previously been supported (MacKinnon et al., 1999). After the event in question, the dancers rated the same items tapping their affective states at that point in time. The dancers were also asked to respond to a series of items thinking about how they felt in the event they had just attended. This section of the

diary included two items randomly selected from each of the initial measures tapping autonomy support, and autonomy, competence and relatedness satisfaction. For simplicity and parity, all items were gauged on a scale of one (*strongly disagree*) to seven (*strongly agree*). In the class diaries, autonomy support and BPNS items followed the stem "in this class". When necessary, minor tweaks were made to the stem and item content to relate specifically to rehearsal and performance situations.

Data Analysis

Firstly, we examined mean level differences in the targeted variables among dancers specializing in ballet, contemporary and Chinese dance. As significant differences were evident, we controlled for genre as a level-two predictor in the multilevel analyses, so as to partial out any effect of this variable upon the results. Multilevel modeling (MLM) with version 2.14 of the MLwiN software (Rasbash, Charlton, Browne, Healy, & Cameron, 2009) was employed as the primary analysis tool. MLM is particularly useful when there are missing observations since it does not assume equal number of measurement occasions for all individuals (Snijders & Bosker, 1999). MLM is suitable when data are hierarchically structured, such as when events (e.g., classes; level one) are nested within persons; level two (Snijders & Bosker, 1999). The level one model captures the extent to which each dancer's perceptions of autonomy support, basic need satisfaction and affective states fluctuate over time. In the first step of each analysis, the daily measures of the three basic needs and perceptions of autonomy support were modeled (in separate models), as predictors of post-event positive and negative affect. The level two predictors ('typical' level perceptions of autonomy support and autonomy, competence and relatedness satisfaction in school, reported in full length questionnaires completed one week before the diary study) were examined via the level two model and added to the model in the second step of each analysis. These person

level variables were centered on the sample means and daily measures were centered on each individual's mean for the variable in question (Singer & Willet, 2003).

Cross-level interactions (Reis et al., 2000) between typical level and daily measures of autonomy support, autonomy, competence and relatedness satisfaction were added to the level two model. Significant interactions were probed (Aiken & West, 1991) and the significance of the simple slopes was tested (Preacher, Curran, & Bauer, 2006).

Results

Preliminary Analyses

Prior to the main analysis, daily class diary data were reduced to aggregate scores by averaging the daily data for each variable. Table 1 presents descriptive statistics and correlations between the typical level and aggregated daily class measures (descriptive statistics and correlation matrices for the rehearsal and performance datasets are available from the first author on request). Mean scores of the typical level variables indicated that the dancers' usually perceived their instructors to provide moderately high autonomy support. Autonomy, competence and relatedness need satisfaction were above the scales' midpoints. The dancers typically experienced positive affective states more than negative emotions. The direction of correlations between variables measured at the typical level, as well as at the daily level, conformed with BNT (Deci & Ryan, 2000). Preliminary MLM analysis revealed gender differences in positive and negative affect. Specifically, females reported higher negative affect and lower positive affect than males. Therefore, we controlled for gender in all models.

Perceived Autonomy Support, Basic Psychological Need satisfaction and Different Dance Genres

A series of multilevel models were tested to examine whether there were significant differences in the dancers' daily perceptions of autonomy support, need satisfaction and

positive and negative affective states as a function of the main genre in which the dancers' trained. In each model, the magnitude of the beta associated with each predictor was statistically tested against the reference category via contrast coding.

There were genre differences in perceptions of daily autonomy support (ballet = 0, contemporary = 1 (b = -0.18, p = .53), Chinese = 2 (b = -.86, p = .04)). Specifically, those specializing in Chinese dance perceived their daily classes to be lower in autonomy support than their ballet and contemporary peers. Chinese dancers also reported lower autonomy (ballet = 0, contemporary = 1, (b = 0.43, p = .23), Chinese = 2 (b = -1.05, p = .04)), competence (ballet = 0, contemporary = 1, (b = -0.43, p = .13), Chinese = 2 (b = -0.82, p = .03) and relatedness (ballet = 0, contemporary = 1, (b = -0.28, p = .35), Chinese = 2 (b = -0.88, p = .03)) need satisfaction in dance classes on a daily basis. Dance genre differentially predicted changes in daily positive affect in class (controlling for pre-class positive affect; ballet = 0, contemporary = 1 (b = 0.47, p < .001), Chinese = 2 (b = - 0.11, p= .43)). Genre also significantly predicted changes in daily negative affect (ballet = 0, contemporary = 1 (b = 0.69, p < .001), Chinese = 2 (b = 0.10, p= .65)). These analyses revealed that contemporary dancers reported more pronounced changes in daily positive and negative affect than the ballet and Chinese dancers.

Typical and Daily Experiences of Autonomy Support and Basic Psychological Need Satisfaction in Class, Rehearsal and Performance Situations

MLM techniques were employed to examine the interrelationships specified in BNT (Deci & Ryan, 2000). Gender and genre were included as fixed predictors in a baseline model upon which all subsequent models were built. In the first step of each analysis concerning changes in daily positive or negative affect, the pre-event measure of the corresponding affect was included as a predictor to control for any 'carryover' effect from the beginning to the end of the event. Models were built in two stages. In step one, the targeted daily variables were

modeled as random between-person (where the between-person variance was found to be non-significant, they were entered as fixed) predictors of change in positive or negative affect during the event in question. In step two, the typical level measures of the targeted variable(s), and the product terms of daily and typical (e.g., daily autonomy support x typical autonomy support) were simultaneously added to the equation as fixed level two predictors.

Class. In step one, the dancers' daily perceptions of autonomy support during class positively predicted changes in positive affect during class. In step two, typical perceptions of autonomy support and the typical x daily product term were significant determinants of changes in positive affect (see Table 2). In this latter equation, the contribution of autonomy support measured at the daily level remained significant. When added to the baseline model, these predictors explained 21% of the variance in the dancers' changes in positive affect during classes, which is an indicator of effect size (Snijders & Bosker, 1999).

The typical x daily autonomy support interaction significantly predicted changes in positive affect. This effect suggests that dancers experience highest positive affect after class when typical *and* class-specific perceptions of autonomy support are high. The simple slopes for high and low typical autonomy support were significant (high: $b = .36$, $p < .001$, low: $b = .48$, $p < .001$).

Dancers' perceptions of daily autonomy support in class negatively predicted changes in negative affect. The level two predictors did not significantly relate to changes in changes in negative affect during class. Three percent of the variance in changes in negative affect was explained by these predictors.

This analytical approach was replicated to determine whether basic psychological need satisfaction experienced during class related to changes in positive affect. In the level one model, daily competence and relatedness satisfaction during classes positively predicted changes in positive affect during class. When typical level needs and the typical x daily needs

interaction terms were added to the model, daily post-class autonomy, competence and relatedness and the autonomy daily x typical interaction term significantly predicted changes in daily positive affect but typical level basic psychological need satisfaction did not. Probing the interaction, we found that when typical autonomy need satisfaction was low, autonomy need satisfaction during classes predicted increased positive affect (b = .15, p < .001). On the contrary, when typical level autonomy need satisfaction was high, changes in positive affect were largely unaffected (b = -.04, p = .20) by whether daily autonomy need satisfaction in class was high or low. Eighteen percent of the variance in changes in positive affect was explained.

Daily competence, relatedness, and autonomy satisfaction during class negatively predicted changes in negative affect during class. Typical level needs did not significantly predict changes in negative affect during class (ps < .05). Seven percent of the variance in changes in negative affect was explained in the equation specified in step two.

Rehearsal. In step one, daily perceptions of autonomy support positively predicted changes in positive affect during rehearsals. In step two, typical perceptions of autonomy support positively predicted the changes in the dancers' positive affect from beginning to the end of the rehearsal. Twenty two percent of the variance in changes in positive affect was explained by the predictors in this model. Changes in negative affect during rehearsals were not significantly predicted by perceptions of autonomy support during the rehearsal or typical perceptions of autonomy support. Eight percent of the variance in changes in negative affect was explained in this model.

Next, the daily basic needs were modeled as predictors of changes in positive affect during rehearsals. In step one, post-rehearsal autonomy and relatedness, but not competence satisfaction, significantly predicted changes in positive affect during rehearsals. In this model, typical relatedness satisfaction, as well as daily autonomy and relatedness, significantly

predicted changes in positive affect during rehearsals. Changes in negative affect during rehearsals were significantly predicted by post-rehearsal ratings of competence need satisfaction, but not by daily autonomy or relatedness need satisfaction or typical levels of these basic needs. The predictors explained 15% of the variance in change in negative affect during rehearsals.

Performance. Daily perceptions of autonomy support did not significantly predict changes in positive affect during performance. In step two, typical levels of autonomy support did not emerge as significant predictors of performance-related changes in positive affect. Fifteen percent of the variance in changes in positive affect during performance was explained by the predictors. Changes in negative affect during performances were not significantly predicted by daily perceptions of autonomy support (step one) or by typical perceptions of autonomy support. This model explained less than 0.1% of the variance.

Next, the daily basic needs were examined as predictors of changes in positive affect during performances. In step one, daily autonomy and competence need satisfaction significantly predicted the dancers' changes in positive affect during the shows. When typical levels of need satisfaction were added in step two, the model failed to converge. The model was re-tested with all predictors fixed at the between-person level. In this model, daily competence was the only significant predictor of changes in positive affect during the performance. As all predictors were fixed at the between-person level, variance explained couldn't be calculated.

Daily autonomy, competence and relatedness were modeled as fixed predictors of change in negative affect during performances. Only daily competence need satisfaction significantly predicted changes in negative affect in performances. Typical need satisfaction did not significantly predict changes in negative affect during performance. However the interactions between daily and typical autonomy and relatedness emerged as significant

predicators of changes in negative affect during performances. Probing of the interactions revealed that when typical autonomy need satisfaction was low, increases in situational levels of autonomy need satisfaction were related to decreases in negative affect during performances (b = -.18, p < .01). However, when typical autonomy need satisfaction was high, increases in situational autonomy need satisfaction were not related to changes in negative affect (b = -.002, p = .97). Moreover, when typical relatedness need satisfaction was high, increases in daily relatedness satisfaction were also not related to increases in negative affect (b = -0.10, p = .15). In the case when typical relatedness was low, increases in daily relatedness need satisfaction significantly corresponded to increases in negative affect during performances (b = 0.30, p < .001).

Discussion

The present study employed a diary methodology to test Basic Needs Theory (Ryan & Deci, 2002) across different dance genres, as well as in dance classes, rehearsals and performances. This study also tested at the within-person level, the 'perceived autonomy support – BPNS – affective states' sequence across dance classes, rehearsals and performances that would vary in their evaluative potential. Collectively, the results provided partial support for the universality hypothesis within the domain of vocational dance.

Perceived Autonomy Support, Basic Psychological Needs, and Different Dance Genres

The study explored mean differences in the targeted variables between dancers training in genres typically more controlled and structured (ballet and Chinese) and those training in a genre typified by freedom and self-expressiveness (contemporary). Results revealed Chinese dancers to perceive their classes as significantly lower in perceived autonomy support than their peers training in contemporary and ballet classes. Despite anecdotal reports to the contrary, the results indicated that the social environment in ballet and contemporary dance classes were equally autonomy supportive and levels of autonomy

support were above the midpoint. Parallel to what was observed in terms of their ratings of autonomy support provision, our findings suggest that Chinese dancers experienced lower autonomy, competence and relatedness need satisfaction in classes than fellow students specializing in ballet or contemporary dance (between whom there were no significant differences in basic psychological need satisfaction).

Taken in their totality, findings indicate that the nature of the dance genre may play a role in the opportunities for basic psychological need satisfaction afforded in the class. However, as these conclusions are based on between-person analyses only, findings should be cautiously interpreted. Future research might examine within-person variability in perceptions of autonomy support, basic need satisfaction and affective states across classes in these different genres. This would help to clarify whether the observed differences are a function of individual differences or features of the dance form or style per se. Objective assessments of the autonomy supportive features of the teaching climate alongside measures of dancers' perceptions of other dimensions of the social environment (e.g., controlling teacher behaviors) may help to explain why Chinese dancers may be less likely to perceive their classes as autonomy supportive and experience lower basic psychological need satisfaction than their peers who specialise in ballet or contemporary dance.

The BNT Sequence in Class, Rehearsal and Performance Situations

The findings regarding the 'autonomy support – basic needs' relationship was consistent across situations. Specifically, the results indicated that situational perceptions of autonomy supportive teaching behaviors positively predicted the dancers' state levels of autonomy, competence and relatedness satisfaction in classes, as well as within the more evaluative settings of rehearsals and performances. These findings extend past research that had implicated general levels of autonomy support in the targeted setting (Gagne et al., 2003) and other social factors (Reis et al., 2000) as accounting for day-to-day fluctuations in

autonomy, competence and relatedness. Aligned with cross-sectional (Quested & Duda, 2010) and longitudinal (Quested & Duda, 2011) BNT-grounded investigations in dance, the dancers' daily perceptions of autonomy support in classes and rehearsals were most strongly associated with relatedness need satisfaction. The findings indicate that peaks and troughs in dancers' feelings of belongingness may be especially sensitive to daily change as a consequence of the degree of autonomy support one experiences in class and rehearsals. However, in performances, perceptions of autonomy support were most strongly associated with dancers' competence need satisfaction. This may be because the experience or witnessing of personal competence is more salient in performance settings where capability is in public display.

There was between-situation variability in the nature of the relationship between autonomy support in class and changes in affective states. One explanation for these inconsistent findings rests in the nature of the activity in question. It is possible that in the more evaluative setting of rehearsals and performances, other facets of the social environment are more prominent as predictors of affective states. For example, previous studies have found perceived ego-involving sport climates (Ames, 1992) to be associated with higher performance-related distress and anxiety among athletes (Ntoumanis & Biddle, 1998; Pensgaard & Roberts, 2000) and dancers (Carr & Wyon, 2003). Ego-involving climates are marked by their inherent focus on normatively evaluated conceptions of ability (Ames, 1992; Duda & Balaguer, 2007). In such settings, mistakes are less tolerated and only the best dancers are likely to receive praise and attention (Newton, Duda, & Yin, 2000). On the contrary, task-involving climates encourage dancers to focus on their own effort and important role in the performance (Duda, 2001). The demonstration of competency is more 'on the line' during rehearsals and performances (in contrast to daily classes). Therefore, affective states in performance may be more predominantly determined by whether the

psychological climate surrounding the performance itself was perceived as task- and/or ego-involving. Cross-sectional research established that, when collectively modeled as predictors, these dimensions of the social-environment account for variance in dancers' affective states, over and above that explained by perceptions of autonomy support (Quested & Duda, 2010). Future research using a diary methodology might simultaneously tap a range of social environmental characteristics pulling from different motivational frameworks, such as the degree to which the teacher creates a task- and/or ego-involving environment or is social supportive (Ryan & Solky, 1996) and/or controlling (Bartholomew, Ntoumanis, Ryan, Bosch, & Thogersen-Ntoumani, 2011).

Daily autonomy, competence and relatedness satisfaction have previously been identified as relevant contributors to the daily emotional experiences of students (Reis et al., 2000; Sheldon, Ryan, & Reis, 1996) and athletes (Bartholomew et al., 2011; Gagne et al., 2003). In the present results, each need made a unique contribution towards the observed changes in positive and negative affect that the dancers experienced during classes. However, this study revealed there to be inconsistencies in the salience of each need to changes in affective states across the three settings of dance classes, rehearsals and performances. This observation suggests that situational or contextual cues may influence the extent to which state levels of autonomy, competence and relatedness satisfaction are relevant to changes in daily affective states. The present findings suggest that need satisfaction *does* seem to be a relevant concomitant of affective states across different situations within the world of vocational dance. However, the results also indicate that the predictive utility of each need is not invariant across the three targeted settings of classes, rehearsals and performances.

Competence was the only need to significantly and negatively predict changes in the dancers' negative affective states during rehearsals and performances. As young trainee dancers suddenly in the unfamiliar limelight, it is perhaps unsurprising that competence need

satisfaction contributed most substantially towards the changes in negative affect. In the case of performance, competence need satisfaction most substantially predicted the changes in positive affect that the dancers experienced during these more performance-focused events. The rehearsal and performance situations demanded that the dancers demonstrated their aptitude in relation to an event that was highly regarded in the school. During performances, future employers (e.g., the directors of professional companies), as well as friends, family, peers and teachers would most likely have been members of the audience. Competence need satisfaction has previously been recognized as relevant to the affective states of those engaged in sport and hip hop dancers, as displays of ability are an integral and important feature of sport and dance participation (Quested & Duda, 2009b; Reinboth, Duda, & Ntoumanis, 2004).

Aligned with the findings of past cross-sectional work in the dance domain with fulltime dance students (Quested & Duda, 2010), relatedness emerged as the strongest predictor of the vocational dancers' positive affective responses in the class setting. However, the findings vis-à-vis the 'relatedness – positive affect' association were not strong (rehearsals) or not significant (performance) in the other targeted contexts. As proposed earlier, this may be because competence need satisfaction was more relevant in the more performance-focused activities. Another possibility is that daily classes allow more opportunities for social exchange with fellow students than in the case of rehearsals and performances. It has previously been shown that dancers' affective states may be especially sensitive to the extent to which they feel a sense of belongingness in the settings which center more on full time learning (Quested & Duda, 2010).

Typical and Daily Level Perceptions of Autonomy Support, Basic Psychological Need Satisfaction and Daily Affect

Past research has indicated that day-to-day experiences of basic psychological need satisfaction may be more influential predictors of well-being than more general or typical level measures of basic psychological needs satisfaction (Reis et al., 2000). The present study supports and extends this proposition by examining situation-specific basic psychological need satisfaction. Typical levels of the dancers' basic psychological need satisfaction experienced in the dance school over time were not significantly associated with the changes in affective states experienced during dance classes. The only exception was that typical experiences of relatedness satisfaction predicted changes in positive affect during rehearsals. In a rehearsal setting, there may be a sense of camaraderie, as the team works together towards a common goal of maximizing the quality of the forthcoming performance. If the dancers usually feel a sense of more pronounced belongingness within their school, then it makes sense that they might experience increases in positive affect after engaging in different activities within this social atmosphere. This suggestion is congruent with recent findings that indicated those with higher person-level relatedness to derive more affective significance from social interactions (Moller et al., 2010).

Two significant interactions were found between typical level and situation specific autonomy need satisfaction. Specifically, these interactions significantly predicted changes in positive affect in class and changes in negative affect during performances. These results are indicative of the deprivation hypothesis (Reis et al., 2000). This hypothesis suggests that the potency of daily need satisfaction will be greater in the case when the typical (or more generally experienced) level of need satisfaction is low. It was also noteworthy that this study found the affective states of dancers with generally high autonomy need satisfaction were not influenced by low levels of state autonomy need satisfaction.

The significant interaction for relatedness is more complex to unravel. Findings indicated that, for dancers whose general relatedness was low, increases in daily relatedness were associated with increases in negative affect. One possible explanation is that these dancers experienced greater concern about letting down their peer group with whom they felt connected on that day. If their relatedness was not usually high, they might have felt they had more to lose by letting down their fellow dancers. Nevertheless, collectively, these findings indicate that there may be individual differences in how dancers respond emotionally when their basic psychological needs are satisfied. This is also aligned with the points made by Reis et al (2000), regarding the importance of considering typical and state assessments of basic needs. The results points to the benefits of fostering dancers' general levels of autonomy and relatedness need satisfaction. When general levels are high, dancers may be less emotionally affected by occasions when need satisfaction is low.

It is noteworthy that person-level perceptions of autonomy support in the dance school were significantly related to the dancers' changes in positive affect during classes and rehearsals. The significant typical x state autonomy support interaction was indicative of a sensitization effect (Reis et al., 2000). In other words, the dancers who usually perceived their teachers as autonomy supportive were found to be more sensitive to the daily effects of autonomy supportive teaching. Consequently, these dancers were more likely to report positive affect after class when the autonomy supportive behaviors of the teacher were reflective of what they considered to be typical in their school. This finding points to the importance of consistent provision of autonomy support, in all classes.

Conclusions and Practical Implications

Taken in their totality, the findings from this study indicate that daily experiences of autonomy support and autonomy, competence and relatedness satisfaction have implications for the psychological health of performing artists across three divergent learning and

performance scenarios. Using a daily diary methodology, it was possible to uncover differences in the relevance of each basic need in learning (class) and more evaluative performance (rehearsal, performance) settings, across a number of days.

This study was only able to offer partial support for the universality hypothesis that is central to BNT (Ryan & Deci, 2002). Overall, the between-person analyses indicated that dance genre did not moderate the relationships between perceived autonomy support and basic psychological need satisfaction, and changes in the dancers' affective states in classes, rehearsals and performance settings. Findings also supported the applicability of the BNT sequence (Deci & Ryan, 2000; Ryan, 1995) at the within-person level in the targeted learning-orientated setting. However, results were less telling about the predictors of state well- and ill-being in more evaluative settings. Nevertheless, this study indicates that in every situation, at least one need significantly predicted changes in affective states during the event in question. Thus, it seems clear that basic need satisfaction *is* of relevance to daily experiences of affective states. However, the relative importance of each basic need may vary as a function of social-environmental (e.g., the degree of autonomy support) and/or situational (e.g., whether the dancer is in a setting focused on learning or performance) characteristics of the setting or context in question. Further BNT-based research using the diary approach is warranted. Such research could target a wider range of social and situational environmental characteristics, in both learning and performance situations, as well as other life contexts. In addition, future studies could extend the present work by testing our hypotheses with a balanced number of measurement occasions per situation. This would make it possible to examine the moderating role of the situation.

The diary methodology renders field research vulnerable to other limitations that may be relevant to consider when interpreting findings. For example, although basic psychological need satisfaction was measured immediately following the class (or rehearsal or

performance) and the stem of the items was referenced towards the targeted event, it is possible that other interactions or experiences during the day (e.g., with parents, other teachers or peers) could have impacted the dancers' reported basic psychological need satisfaction. Moreover, positive and negative affective states are only two of an array of potential indicators of well-/ill-being. Future studies could examine SDT-based daily predictors of a wider range of well-and ill-being variables. Within the present study, we asked the dancers to report the day and time of each individual data entry, however our methods were limited as we relied on self-reported details of when the entries were completed. The use of data collection methods that enable objective verification of time and date of data entry would also be advantageous in future studies.

BNT holds that healthful functioning will be forestalled when basic psychological need satisfaction is compromised (Deci & Ryan, 2000). Subsequent research could examine the long term health impact of day-to- day fluctuations in basic psychological need satisfaction, in demanding performance as well as learning settings. Repeated measures of basic psychological need satisfaction, alongside regular assessments of psychological as well as biological functioning, would be informative with regard to the short-term and long-term consequences of daily variability in basic psychological need satisfaction, as well as need thwarting.

In sum, findings point to the importance of daily provision of need supportive dance training, if dancers are to experience optimal affective states in dance classes. This aspiration could be considered challenging when dance teachers must balance the traditions of a dance discipline, as well as demanding teaching, rehearsals and performance schedules. Future research, in which BNT-based (Deci & Ryan, 2000; Ryan, 1995) dance teacher training interventions are designed and rigorously tested, is therefore warranted. Such work would be

a strong first step on the path towards maximizing the possibility of health-conducive training and performance climates in the dance domain.

Table 1.

Mean Scores, Standard Deviations and Correlations Between Typical Level and Day Level Class Variables

Variable	*M* (SD)	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
General level														
(1) Autonomy support	4.65 (1.24)													
(2) Autonomy	4.10 (1.09)	.74**												
(3) Competence	4.46 (.95)	.39**	.50**											
(4) Relatedness	3.32 (.85)	.75**	.67**	.40**										
(5) Positive affect	3.18 (.62)	.35*	.25	.46**	.33*									
(6) Negative affect	2.53 (.75)	-.55**	-.37**	-.29*	-.42**	-.23								
Daily (pre)														
(7) Positive affect	2.59 (.67)	.16	.22	.09	.19	.39**	.18							
(8) Negative affect	1.65 (.57)	-.15	-.16	-.19	-.07	-.05	.35*	.21						
Daily (post)														
(9) Autonomy support	4.49 (1.01)	.44**	.44**	.36*	.38**	.41**	-.39**	.47**	-.37**					
(10) Autonomy	3.92 (1.24)	.25	.22	.27	.21	.27	-.17	.41**	-.20	.80**				
(11) Competence	4.26 (.98)	.22	.33*	.63**	.21	.38**	-.22	.24	-.40**	.61**	.62**			
(12) Relatedness	4.45 (1.03)	.31*	.30*	.45**	.26	.47**	-.45**	.36**	-.43**	.85**	.70**	.71**		
(13) Positive affect	2.71 (.64)	.19	.25	.18	.20	.45**	.05	.91**	.16	.57**	.58**	.37**	.49**	
(14) Negative affect	1.67 (.61)	-.19	-.23	-.27	-.10	-.08	.37**	.17	.96**	-.40**	-.22	-.47**	-.49**	.13

Note. All responses were provided on a 1-7 scale, with the exception of the initial assessments of relatedness, positive and negative affect, and the diary measures of positive and negative affect which were measured on a 1-5 Likert scale.
* = $p < .05$, ** = $p < .01$, ***= $p < .001$

Table 2.

Predicting Dancers' Positive and Negative Affect From Typical-level and Daily Measures of Perceptions of Autonomy Support and BPNS

	Class		Rehearsal		Performance	
	Positive affect	Negative affect	Positive Affect	Negative affect	Positive affect	Negative Affect
Autonomy Support						
Step one						
Pre-event positive/negative affect	0.52***	0.49***	0.46***	0.49***	0.50***	0.07
Daily autonomy support	0.17***	-0.08**	0.15**	-0.03	0.04	-0.07
Step two						
Pre-event positive/negative affect	0.54***	0.48***	0.47***	0.52***	0.52***	0.07
Daily autonomy support	0.42***	-0.20	0.21	-0.03	0.05	-0.05
Typical autonomy support	0.25***	-0.01	0.26**	-0.13	0.22	-0.02
Typical x daily autonomy support	-0.05*	0.03	-0.01	-0.02	-0.003	-0.06
Basic psychological needs						
Step one						
Pre-event positive/negative affect	0.44***	0.45***	0.48***	0.45***	0.49***	0.02
Daily autonomy	0.05	-0.05*	0.10*	0.003	0.15*	-0.04
Daily competence	0.11***	-0.07*	0.08	-0.12*	0.27*	-0.16*
Daily relatedness	0.17***	-0.06*	0.09*	-0.04	-0.02	0.08
Step two						
Pre-event positive/negative affect	0.44***	0.44***	0.47***	0.46***	0.53***	0.01
Daily autonomy	0.05*	-0.05*	0.10*	0.01	0.10	-0.09
Typical autonomy	0.13	-0.11	0.10	-0.15	0.15	-0.11
Typical x daily autonomy	-0.09***	0.03	-0.07	-0.03	0.02	0.14**
Daily competence	0.12**	-0.07*	0.06	-0.12**	0.25**	-0.17**
Typical competence	0.04	-0.13	-0.14	-0.19	-0.22	-0.12
Typical x daily competence	-0.001	0.01	0.06	0.003	0.12	0.05
Daily relatedness	0.17***	-0.06*	0.10*	-0.04	-0.08	0.1
Typical relatedness	0.16	0.18	0.34*	0.18	0.11	0.26
Typical x daily relatedness	0.02	-0.019	0.06	-0.01	-0.07	-0.22***

Note. * = $p < .05$, ** = $p < .01$, ***= $p < .001$. Pre-event positive or negative affect was controlled in the equations predicting post-event positive and negative affect, respectively.

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