A Confirmatory Factor Analysis of the Positive Affect Negative Affect Schedule (PANAS) With a Youth Sport Sample

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Affective states have been increasingly recognized as a fundamental component of physical activity (Crocker & Graham, 1995b; Gauvin & Rejeski, 1993; Scanlan, Carpenter, Schmidt, Simons, & Keeler, 1993). Recently, concerns have been raised about the measurement of affective states in many physical activity studies (Crocker, Bouffard, & Gesseroli, 1995; McAuley & Courneya, 1994; Rejeski, Hardy, & Shaw, 1991). Many researchers have employed affective measures that were not developed for physical activity populations and that have not been validated for specific physical activity contexts. The measurement properties and subsequent measurement and construct validity of many affective measures employed by sport and exercise scientists are still open to question.

One affective instrument that has been criticized by sport and exercise researchers (e.g., Gauvin & Rejeski, 1993; McAuley, 1991; McAuley & Courneya, 1994) is the Positive Affect Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988). The PANAS was originally developed to be a brief but psychologically sound measure of two conceptually independent (orthogonal) mood dimensions: positive affect and negative affect (Watson et al., 1988). Positive affect (PA) reflects pleasurable engagement, whereas negative affect (NA) is a general dimension of subjective distress. The PANAS consists of two scales, one to assess PA and the other to assess NA. Each scale comprises 10 items scored on a 5-point Likert scale. The scales can be used as state or trait measures of affect by using different instructions. The selection of items for each scale was partly based on previous research of content categories of mood descriptors (e.g., Zevon & Tellegen, 1982). The construction of the NA scale included two items from five content categories (distressed, angry, fearful, guilty, and jittery). The PA scale items included three items from the attentive and excited categories and two items from the proud and strong categories. Watson et al. (1988) reported that both the PA and NA scales had adequate internal consistency (α > .84) and item, factorial, and external validity for adult community populations.

The PANAS has been utilized in several physical activity studies (e.g., Bouffard & Crocker, 1992; Crocker & Bouffard, 1992; Crocker & Graham, 1995a.

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Hamid, 1990; Walsh, Crocker, & Bouffard, 1992). Research findings have provided favorable reliability and validity for the PANAS. Crocker and his colleagues have established acceptable internal consistency for both the NA state scale (average $\alpha = .84$) and PA state scale (average $\alpha = .86$). Several studies have reported empirical evidence consistent with expected theoretical relations. Perceived challenge was associated with high levels of positive affect and low levels of negative affect in individuals with physical disabilities (Bouffard & Crocker, 1992). Negative affect was significantly higher in failure conditions compared to success conditions when college students were performing a novel movement task (Walsh et al., 1992). Hamid (1990) reported that trait positive affect was positively associated with higher satisfaction for an exercise program and slower drop-off in continued exercise involvement. Crocker and Graham (1995a) found negative affect positively associated with venting of emotion and self-blame coping dimensions in competitive athletes.

Despite the initial psychometric support for PANAS in physical activity contexts, there is still some apprehension about its validity. Gauvin and Rejeski (1993) argued that the adjectives used in the PANAS were not driven by a conceptual framework that considers exercise experience. This concern was also echoed by McAuley and Courneya (1994) who further questioned the conceptual assumption of two independent affective states. Their concerns were based both on their own empirical finding that PA and NA scales were moderately positively correlated and work by Green, Goldman, and Salovey (1993) on systematic and random measurement error in affective scales. Yet, research by Crocker and his colleagues provided evidence that in sporting and other physical activity contexts, the PANAS demonstrated acceptable reliability and construct validity.

Concerns can also be raised about whether the NA scale represents only a single dimension of general distress, as it contains both morally related (guilty, shame) and anxiety related (irritable, nervous) adjectives. The construction of the scale supports this contention since items were selected from five content categories (Watson et al., 1988, p.1064). Nevertheless, Watson and his colleagues have argued that the NA scale is designed to capture the general negative valence associated with subjective distress, a claim supported by exploratory factor analysis in their studies.

The validity of the PANAS to measure general affective states in physical activity settings has been supported primarily with adult populations. It is important that the generalizability to other populations, such as sporting youth, be established. Moreover, the factor stability of the PANAS has not been established with physical activity populations. Therefore, the purpose of this study is to examine the factorial validity of the PANAS in a sporting youth sample by confirming the hypothesized two-factor structure.

**Method**

**Participants**

Participants were in summer sport camp programs at a major Canadian University. Data were collected from 671 participants. Participants with missing data were dropped from the analysis, resulting in a final sample of 645 (383 males and 262 females). Participants ranged in age from 10 to 17 years ($M = 14.15$, $SD = 1.68$ years). The participants competed in the activities of coed track and field, boys’ and girls’ basketball, boys’ and girls’ soccer, girls’ synchronized swimming,