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The Dynamic Interface Between Neuromaturation, Risky Behavior, Creative Dance Movement, and Youth Development Programming

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Abstract A quasi-experimental study was undertaken to determine whether length of participation in an inner city youth dance program helped young people avoid risky behavior and acquire competence in essential life skills. The Piers-Harris Children's Self-Concept Scale (Piers-Harris 2), a widely used measure of psychological health, was administered to participants ($n = 17$) for 3 consecutive years. Of six Piers-Harris 2 subscales, only results on the Physical Appearance and Attributes subscale (corresponding to the program's youth development goal of positive self-image) indicated a statistically significant difference, with third-year participants scoring higher than first- and second-year participants. Study participants were also given a program feedback survey on which the majority of participants characterized dance program teaching artists as positive role models, found programming to be very useful, and reported gains in essential life skills.

Keywords At-risk behavior · Dance movement · Kinesics · Neuromaturation · Youth development

Introduction

When examined across sociodemographic groups, data suggest that U.S. youth—suburban, urban, rural; white, black, Hispanic; low-, middle-, upper-income; female and male—regularly encounter destabilizing risk factors (Chung & Steinberg, 2006; Durlak & Weissberg, 2007; Moore, Lippman, & Brown, 2004; Werner & Smith, 1992; Wikström & Loeber, 2000), many of which, while transient or amenable to

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remediation, are inextricably linked to potentially life-altering circumstances exacerbated by dysfunctional parenting, antisocial peer influence, inadequate supervision, anomalous socialization, trauma, developmental deficits linked to neuromaturation, insufficient life stage mastery, psychopathology, and poverty (Choi, Harachi, Gilmore, & Catalano, 2005; Chung & Steinberg, 2006; Hawkins, Catalano, & Miller, 1992; Luria, 1973; Moore et al., 2004; Wikström & Loeber, 2000).

The advent of youth development programming as the preferred strengths-based model for helping young people obtain preparatory life skills essential for adulthood presents program administrators with the daunting task of evaluating a service delivery system's utility and selecting a research methodology that generates reliable outcome data (Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004; Cozby, 2007). Research also indicates that in addition to reducing risky behavior, youth development programming can improve social consciousness and self-efficacy (Choi et al., 2005; Howell, 2003; Moore et al., 2004; Werner & Smith, 1992; Wikström & Loeber, 2000).

Literature Review

Neuromaturation: Risk Taking and Maladaptive Behavior

Emerging research suggests that when neurological deficits (i.e., cognitive, volitional, psychological, and/or emotional dysregulation caused by abnormal, incomplete, or impaired prefrontal cortex and/or neural substrate development) are coupled with insufficient adult supervision, there is increased susceptibility for youth to engage in risky, antisocial, maladaptive behavior (Howell, 2003; Lerner & Lerner, 1999; Llinás, 1989; Luria, 1973; Postle, 2015; Wikström & Loeber, 2000).

In the context of youth development, the human prefrontal cortex is essential for evaluating feedback; establishing task completion criteria; forming schemata; reconciling incongruent beliefs; modulating impulses; categorizing information by type; processing neurosensory messages; and integrating and synchronizing executive functions associated with synaptic or neurocognitive plasticity, metacognition, inductive reasoning (i.e., capacity to weigh multiple perspectives), sensory processing (i.e., capacity to interpret and catalogue stimuli), intentionality (i.e., capacity to stop a particular behavior or thought), and decision-making accuracy (Llinás, 1989; Luria, 1973; Postle, 2015; Sousa, 2001; Spear, 2000).

Neurodevelopmental disorders or deficiencies are impairments in growth and development of the brain (Fuster, 1997; Llinás, 1989; Luria, 1973; Postle, 2015). A narrower definition refers to abnormally or inadequately developed brain function that affects emotion, learning, behavior, self-control, and/or memory. Abnormalities in neuromaturation may underlie neurodevelopmental deficiencies that affect behavior, visuospatial cognition, visual motor control, impulsivity, and judgment (Fuster, 1997; Luria, 1973; Postle, 2015). Understanding the typical pattern of neuromaturation provides a framework for recognizing atypical patterns of neurodevelopment, e.g., variations in the rate of progression and achievement of

executive functions (Llinás, 1989; Luria, 1973; Mesulam, 1986; Postle, 2015; Sousa, 2001).

Neuromaturation is the functional development of the brain (Llinás, 1989; Luria, 1973; Postle, 2015). It is a dynamic process, a continuous interaction between the genome and the intra- and extrauterine environments (Fuster, 1997; Luria, 1973; Postle, 2015). Understanding neuromaturation is fundamental to understanding neurodevelopment and related executive functioning in children and adolescents. In addition, understanding neuromaturation has the potential to provide insight into mechanisms of brain abnormalities and the relationship between brain structure, function, and development of neurologically-based skills involving self-regulation, sensory and emotional modulation, reasoning, and perceptual abilities (Llinás, 1989; Luria, 1973; Postle, 2015).

Since meta-analysis research confirms a connection between neuromaturation, executive function, and neurodevelopment, behavioral and emotional implications associated with prefrontal cortex development are inextricably linked to managing cognitive processes, regulating behavior, controlling impulsivity, and providing the intellectual capacity to grasp cause-and-effect relationships (Fuster, 1997; Llinás, 1989; Mesulam, 1986; Postle, 2015; Shimamura, 2000; Miller & Cohen, 2001; Shin, Rauch, & Pitman, 2006). Several unintended yet inevitable consequences appear to be correlated with inadequate neuromaturation precipitated by abnormal or inadequate prefrontal cortex development, most detrimental of which is an increased propensity towards engaging in aberrant or risky behavior (Jessor & Jessor, 1977; Spear, 2000; Wikström & Loeber, 2000; Sousa, 2001; Steinberg, 2008). Relying upon meta-analysis research linking neurodevelopment and neuromaturation to behavior, neuropsychologists have found that in the context of youth development, risk taking tends to increase the likelihood of engaging in maladaptive, antisocial behavior (Catalano & Hawkins, 1996; Dryfoos, 1990; Fuster, 1997; Howell, 2003; Jessor & Jessor, 1977; Llinás, 1989; Postle, 2015).

Neurophysiologic research suggests that executive function dysregulation precipitated by incomplete or delayed prefrontal development is strongly correlated with impetuous behavior, incorrect stimulus valuation, and self-control diminution (Llinás, 1989; Luria, 1973; Mesulam, 1986; Miller & Cohen, 2001; Postle, 2015). Juxtaposed against the backdrop of not having the skills to navigate complex problems associated with object-stimulus cues, prepotency, and anticipatory acuity, behavioral dysregulation actuated by underdeveloped cortical functioning is particularly relevant to middle childhood and adolescence, life stages that are rife with emotional upheaval, conformance dictates, and demands for task mastery, not just equilibrium maintenance (Choi et al., 2005; Fuster, 1997; Lerner & Lerner, 1999; Mesulam, 1986; Postle, 2015).

If not beset by dysregulation or neurological deficits linked to abnormal or incomplete neuromaturation, young people with well-developed executive function skills possess the sapience and valence required for valuation (attraction or aversion to an object, event, or person) and response inhibition (ability to reject peer pressure leading to risky behavior) (Lerner & Keltner, 2000; Mesulam, 1986; Postle, 2015; Steinberg, 2008). Furthermore, neuropsychology affirms an interactive connection between prefrontal neuromaturation and complex cognitive and executive processes

linked to neurodevelopment of the amygdala and hippocampus—brain structures regarded as indispensable for modulating emotion and comprehending the cause-and-effect relationship between risky behavior and adverse consequences (Changeux & Dehaene, 1993; Llinás, 1989; Luria, 1973; Postle, 2015; Shimamura, 2000; Shin et al., 2006; Sousa, 2001).

As a result of developmental deficits attributable to neuromaturation, several inevitable consequences appear to be strongly associated with prefrontal immaturity and asynchrony, the most detrimental of which is a seemingly uncontrollable penchant toward engaging in risky, thrill-seeking behavior (Dryfoos, 1990; Postle, 2015; Spear, 2000). Thus, when linking neuromaturation with behavior, neuroscientists have found that in the context of childhood and adolescence, risk-taking coupled with incomplete neuromaturation appears to be a persistent catalyst for increasing the likelihood of unsafe behavior unless prevention-focused youth development programming is applied (Catalano et al., 2004; Dryfoos, 1990; Postle, 2015; Spear, 2000). Adapted from executive function skills (Fuster, 1997; Luria, 1973; Postle, 2015), youth development programming at Moving in the Spirit (MITS), a non-profit youth development program that combines mentoring, dance movement, and psychotherapy to enrich the lives of inner city youth, encompasses the acquisition, application, and practice of essential life skills, (i.e., decision-making; problem-solving; goal setting; time management; critical and creative thinking; negotiation and compromise; coping with emotion and rejection; resisting peer pressure; communication and interpersonal relationships; assertiveness; and empathy).

Moving in the Spirit: Dance Movement as an Intervening Modality

Founded in Atlanta, Georgia, in 1996 by Dana Lupton and Leah Mann, MITS received the 2005 National Arts and Humanities Youth Program Award, the nation's highest honor for out-of-school arts and humanities programs for young people. Organizationally, MITS comprises several interwoven levels or classes (i.e., Stepping Stones, Junior Company, Apprentice Corporation, Men in Motion, Summer Dance Camp, and Student Touring Company).

In an effort to create enrichment opportunities for youth who might otherwise lack access to out-of-school programming, MITS utilizes an innovative mixture of guided learning, pragmatism, career exploration, mock contracts, and dance movement to teach students how to convey emotion, manage peer pressure, resolve interpersonal conflict, problem-solve, embrace academic excellence, and adopt prosocial life skills.

Rooted in social constructionism, MITS is imbued with concepts gleaned from operant conditioning, creative self-expression theory, humanistic-integrative theory, social learning theory, and developmental psychology, whereby antecedent and predictive factors linked to maladaptive, risky, or antisocial behavior (as well as their interactive nexus, i.e., family, neighborhood, peer group, school) are dissected and analyzed.

Guided by the pioneering work of Rudolf Laban, Irmgard Bartenieff, Liljan Espenak, Marian Chace, and Mary Whitehouse, dance/movement therapy (DMT) at

MITS encapsulates an eclectic, immersive, kinesthetic process wherein teaching artists (TAs) use motion to facilitate self-disclosure and self-analysis. Functioning as therapeutic change agents systematically trained, supervised, and evaluated by a board certified dance/movement therapist (BC-DMT), teaching artists expose students to movement activities that integrate cognitive, emotional, physical, spiritual, and social stimuli; amplify and catalogue nonverbal behavior; advance psychosocial maturation; and enable discovery of debilitating thoughts, feelings, and interpersonal relationships (Batson, 2009; Bloom, 2006; Gallagher, 2006; Kimmerle & Côté-Laurence, 2003; Meekums, 2002; Schmais, 2004; Tortora, 2006; Whitehouse, 1979).

With kinesics (Birdwhistell, 1979), wordless cues and messages are clarified through a continuous, dynamic, primal, mercurial flow of expressive body language (Bartenieff & Lewis, 1980; Batson, 2009; Kimmerle & Côté-Laurence, 2003; Meekums, 2002; Tortora, 2006). When kinesics is collocated with the spoken word, conscious and unconscious nonverbal actions (e.g., spatial orientation, haptics, proxemics, muscular tension, movement sequence, etc.) become the predominant communicative tools (Bacon, 2007; Batson, 2009; Bloom, 2006; Gallagher, 2006; Meekums, 2002; Staton-Jones, 1992).

Since movement can provide evidence of unconscious psychological processes (e.g., displacement, projection, reaction formation, etc.), MITS staff members' attentiveness to participants' nonverbal actions creates a repository of information about how students compartmentalize feelings, label experiences, manage life-span development, and define self in relation to the world (Bacon, 2007; Bandura, 1986; Bartenieff & Lewis, 1980; Batson, 2009; Meekums, 2002; Moore et al., 2004; Schmais, 2004; Staton-Jones, 1992; Whitehouse, 1979).

When combined with traditional psychodynamic theory, students at MITS experience outcomes that are measurable, salubrious, and attributable to psychosocial benefits derived from improvisational, choreographed, and extemporaneous dance movement. Through DMT, students learn to regulate their sensory system in relationship to and within the contexts of space (interaction with others), motion (self-expression), and psyche awareness (insight regarding unconscious material) (Bloom, 2006; Chaiklin & Schmais, 1986; Gallagher, 2006; Lerner & Lerner, 1999; Meekums, 2002; Postle, 2015; Staton-Jones, 1992).

Influenced by a synthesis of beliefs and techniques gleaned from cognitive-behavioral therapy, Rogerian therapy, and Chacian dance/movement therapy, MITS teaching artists infuse their instruction with motion and dance uniquely designed to formulate a therapeutic movement relationship based on genuineness, trust, unconditional positive regard, and empathy. In this way, teaching artists establish a dyadic alliance in which students feel safe to rethink vexatious, amorphous, or fragmented motor memory information. By participating in corrective body awakening movements that cognitively reframe negative experiences, students are free to experiment with new ways of interpreting, functioning, and living (Bloom, 2006; Chaiklin & Schmais, 1986; Gallagher, 2006; Lerner & Lerner, 1999; Schmais, 2004; Tortora, 2006).

At MITS, introspection is taught through movement exercises that reinforce the therapeutic advantage of scripted and improvisational motion. Movement-oriented

introspection expands students' expressive repertoire by constructing a visual representation of feelings and beliefs. This, in turn, allows students to rectify emotionally toxic beliefs, redefine negative internal and external stimuli, reexamine transitional object relationships, and mitigate the deleterious effect ego defenses can have on psychological and social development (Bandura, 1986; Bloom, 2006; Choi et al., 2005; Postle, 2015). Since the kinesthetic element of DMT strengthens the mind/body connection, students learn how thoughts, not people or events, trigger feelings, and that changes in movement or body orientation can impact perception, reality, and behavior (Lerner & Lerner, 1999; Schmais, 2004; Staton-Jones, 1992; Whitehouse, 1979).

As MITS students employ grounding, peripersonal space awareness, body acceptance, breathing, spontaneous motion, meditation, and role playing to evaluate experiences and ramifications, they realize dance is a cathartic, intersubjective tool that can change behavior; they create expressive movement sequences that accurately reflect feelings and thoughts (Bartenieff & Lewis, 1980; Chaiklin & Schmais, 1986; Meekums, 2002; Schmais, 2004; Whitehouse, 1979).

Since young people quash—as a result of faulty socialization, paradoxical injunctions, and pernicious subliminal messaging—the need to identify and release suppressed material, the resistance to expose and appropriately purge debilitating or socially unacceptable unconscious content is often cited as a catalyst for psychological distress and/or maladaptive beliefs and behavior (Bandura, 1986; Bloom, 2006; Lerner & Lerner, 1999; Postle, 2015; Spear, 2000).

However, DMT possesses the synergistic capacity to enable abreaction—the identification of unconscious material through free association—and represents a medium conducive to facilitating insight and interpretation, necessary elements to make the unconscious conscious (Bloom, 2006; Luria, 1973; Meekums, 2002; Postle, 2015; Staton-Jones, 1992).

Using scripted and unscripted movement to detect unconscious material, teaching artists attend closely to the equilibrium among somatic-based pedagogy and student assimilation, accommodation, and mastery (Bloom, 2006; Chaiklin & Schmais, 1986; Enghauser, 2003; Gadotti, 1996; Gallagher, 2006; Meekums, 2002; Schmais, 2004). Relying upon dance movement infused with analogy, metaphor, and allegory to uncover and then deconstruct unconscious thoughts, motives, impulses and emotions—in a permissive, transformative milieu amenable to exploring cognitive and convictional dissonance—teaching artists guide students to self-awareness via self-disclosure, i.e., *What have you learned about yourself today?*

The ability to regulate one's emotion is a crucial indicator of psychosocial well-being. Utilizing free association, mirroring, witnessing, and body-awakening exercises that emphasize choreographed movement, body-gravity alignment, and spontaneous motion, teaching artists create a therapeutic milieu wherein repressed, suppressed, or dissociated psyche material can be revealed and moved into consciousness. At that point, the student can create a new, accurate, and satisfying perception of self (Bartenieff & Lewis, 1980; Bloom, 2006; Chaiklin & Schmais, 1986; Lerner & Lerner, 1999; Meekums, 2002; Postle, 2015; Whitehouse, 1979). Once material from the somatic unconscious is revealed through expressive movement, licensed mental health professionals at MITS provide cognitive

behavioral therapy to help students understand the cause-and-effect relationship between emotions, thoughts, and behavior.

Embracing the belief that feedback must be unambiguous, purpose-driven, and reciprocal, teaching artists promote student development through student–teacher journal writing, dance movement rubric, Socratic teaching methodology (i.e., inferential-guided inquiry), and a multidimensional, reliable, and validity-tested prosocial tendencies measure (Carlo, Hausmann, Christiansen, & Randall, 2003). Finally, dance movement sessions at MITS embody a multifaceted, combinatorial process, including but not limited to reflective check-in (i.e., students are allotted 10 min to articulate how they feel), physical check-in (i.e., students are allotted 15 min to focus on body mindfulness by engaging in self-choreographed or improvisational movement in response to feedback from a teaching artist and peers), theme exploration (i.e., students are allotted 20 min to engage in scripted and improvised movement sequences and vignettes to explore social cognition and perception, e.g., stereotypes; prosocial behavior; attraction and relationship issues; attentional filtering; cross-cultural differences; and centrality of community, school, family, peer group, and individuality), and reflective check-out (i.e., at the end of every session, students are allotted 10 min to articulate how they feel and what they have learned).

Combining and manipulating the basic components of dance (body, energy, space, time, relationships), kinesthesia is a learning style in which discovery takes place by engaging in movement, rather than simply listening or watching (Bacon, 2007; Birdwhistell, 1979; Chaiklin & Schmais, 1986; Meekums, 2002).

One of the key therapeutic techniques in free-form or expressive dance movement is observing cues and symbols, i.e., movement, gestures, and body language (Bartenieff & Lewis, 1980; Bloom, 2006; Chaiklin & Schmais, 1986; Meekums, 2002). Body language can be exaggerated or abstracted to project an infinite number of feelings, moods, beliefs, and emotions. At MITS, expressive dance movement is an integral part of holistic learning and provides a conduit between movement, body, mind, spirit, and both conscious and unconscious proprioception (Batson, 2009; Bloom, 2006; Enghauser, 2003; Gallagher, 2006; Kimmerle & Côté-Laurence, 2003; Meekums, 2002; Whitehouse, 1979). Through expressive dance movement, teaching artists guide students towards exploring new ways of emoting and behaving.

Methodology, Limitations, and Analysis

This study examined the impact of the MITS Stepping Stones class, which utilizes dance movement as an approach to reduce risky behavior and promote the adoption of prosocial norms that advance emotional, behavioral, cognitive, and moral competence.

Using a repeated measure design (Girden, 1992), the principal research explored whether or not there was a statistically significant relationship between length of Stepping Stones participation and mean scores on the six subscale domains of the Piers-Harris Children's Self-Concept Scale, second edition (Piers-Harris 2), a questionnaire that assesses self-concept in 7- to 18-year-olds (Piers, 1984). The six

subscales are (1) Behavioral Adjustment (BEH), a 14-item scale that measures admission or denial of problematic behaviors (corresponding youth development goal: behavioral competence); (2) Intellectual and School Status (INT), a 16-item scale that measures intellectual and academic abilities (corresponding youth development goal: cognitive competence); (3) Physical Appearance and Attributes (PHY), an 11-item scale that measures a respondent's assessment of physical appearance and attributes (corresponding youth development goal: positive self-image); (4) Freedom from Anxiety (FRE), a 14-item scale that measures anxiety and dysphoric mood (corresponding youth development goal: emotional competence); (5) Popularity (POP), a 12-item scale that measures social functioning (corresponding youth development goal: social competence); and (6) Happiness and Satisfaction (HAP), a 10-item scale that measures contentment with life (corresponding youth development goal: optimism toward the future). A higher score on a subscale indicates better psychological health. Peer-reviewed studies indicate acceptable internal consistency; test–retest reliability; stability of measure; and content, construct, concurrent, discriminant, predictive, and convergent validity of the scales (Franklin, Duley, Rousseau, & Sabers, 1981; Lemley, 2004; Piers, 1984).

The Piers-Harris 2 was administered to seven male and ten female first-year participants ($n = 17$), ages 9–13, in 2012, and re-administered to the same cohort in their second and third years. There were no breaks in years of participation; thus, the Piers-Harris 2 was administered at predetermined intervals for 3 consecutive years, and Piers-Harris 2 subscale scores were compared from year to year, with 2012 serving as the baseline year. For ease of discussion, the first-year test administration is referred to as the pretest.

Administering the test (i.e., Piers-Harris 2) to non-randomly assigned participants over consecutive years provided a computation platform amenable to time series comparison, which in turn, permitted mean score analysis for the purpose of measuring intervention effect, i.e., Stepping Stones class.

This repeated measure design allowed participants to serve as their own controls, thereby reducing error variance (Cozby, 2007; Cronbach, 1990; Girden, 1992; Mosteller & Tukey, 1977; Shadish, Cook, & Campbell, 2000). The greatest threats to this design are test fatigue (i.e., repeated exposure to the same instrument increasing apathy and giving rise to reduced candor) and test familiarity (i.e., repeated exposure to the same instrument engendering bias and leading to contrived answers) (Collie, Maruff, Darby, & McStephen, 2003; Creswell & Plano Clark, 2007; Cronbach, 1990; Girden, 1992; Greene, 2007; Shadish et al. 2000).

Because these threats or challenges can introduce unintended or unwanted variance, this study employed several counterbalancing techniques to control for confounding artifacts linked to test–retest fatigue and familiarity (Cozby, 2007; Girden, 1992; Mosteller & Tukey, 1977; Shadish et al. 2000). Specifically, since the vast majority of unwanted sequencing effects associated with fatigue can be counterpoised by simply controlling how or when a test is administered (Gravetter & Wallnau, 2009; Shadish et al. 2000), this study utilized a 12-month washout period between each administration of the test. Also, to negate carryover threats posed by familiarity, the sequence of subscale questions was randomly rearranged for each test administration (Collie et al., 2003; Girden, 1992; Shadish et al. 2000;

Weinstein & Roediger, 2012). Since participant perception and performance can change over time, counterbalancing can control for or cancel out extraneous threats, whereupon observed effect in the dependent variable is assigned to manipulation of the independent variable, not carryover artifacts.

To measure the degree of difference between multiple data sets, i.e., Piers-Harris 2 mean scores of first-, second-, and third-year Stepping Stone participants, and to examine relative variability and causal relationship, this study relied upon a series of ANOVAs (analyses of variance) to compare responses from pretest to subsequent posttests.

Participants also anonymously completed the Participant Feedback Survey (see “Appendix”), a questionnaire designed to generate qualitative personal feedback regarding the functionality and utility of MITS as a youth development program. The survey was not pretested to validate it for content or construct reliability. However, all content on the questionnaire was read to the participants, en masse, to account for differences in reading abilities.

Since survey development and validation can be arduous and cost prohibitive—especially for small, fixed-funding nonprofits like MITS—and since validity is not an absolute quality (i.e., a survey can have one kind of validity but not another) (Creswell & Plano Clark, 2007; Gravetter & Wallnau, 2009; Patton, 2001), we combined a convergence of different perspectives with triangulation to validate the qualitative data and enhance confidence in the study’s findings (Cozby, 2007; Creswell & Plano Clark, 2007; Patton, 2001; Taskakkori & Teddlie, 1998).

The Participant Feedback Survey (PFS) is a robust, 24-item, self-report measure created using qualitative input (i.e., structured interviews; structured and unstructured observations; and descriptive, evaluative, and collaborative data) obtained from a carefully planned focus group, including but not limited to MITS alumni, board members, and staff (BC-DMT, licensed clinical social worker, licensed professional counselor, naturopathic physician, and teaching artists); corporate partners; community stakeholders; visiting artists; middle and high school guidance counselors; and parents. Focus group discussions can stimulate thinking, reflection, and collaboration (Krueger, 1994; Stewart & Shamdasani, 1990). Combined with other research methods, focus groups can be used to facilitate information elicitation, program evaluation, and instrument development (Krueger, 1994; Stewart & Shamdasani, 1990).

Questions presented on the PFS are self-explanatory, clear, and closed-ended (i.e., participants respond with either a numerical rating or dichotomous answer). Surveys measure opinions, knowledge, attitudes, beliefs, behaviors, reactions, and attributes in response to specific questions, which is of particular benefit when the goal is to capture usable information in a nonthreatening manner. As a frequently employed quasi-experimental technique to gather cohort data from a nonprobability, non-representative convenience sample, self-administered questionnaires similar in purpose and design to the PFS should only be used when the study objective is clear and not complex (Krueger, 1994; Patton, 2001; Stewart & Shamdasani, 1990).

After considering readability (linguistic validity), sample demographics, cohort inclusion criteria, and literacy, we designed the PFS so that every question contained an option that each respondent could accurately use to describe his/her sentiment, behavior, or knowledge. This format is especially important when attempting to pair qualitative and quantitative methods to obtain a comprehensive representation of the phenomena under review (Cozby, 2007; Creswell & Plano Clark, 2007; Krueger, 1994; Patton, 2001). With regard to quantitative and qualitative research, concerns surrounding instrument validity and reliability typically relate to whether the instrument consistently and accurately measures what it intends to measure (Brennan, 2001; Cozby, 2007; Creswell & Plano Clark, 2007; Greene, 2007).

In the absence of statistical analysis (i.e., acceptable reliability and validity coefficients), and based upon focus group observations and respondent feedback, the PFS questionnaire demonstrates face validity (i.e., overall, the survey appears to be effective in terms of its stated purpose), construct validity (i.e., the survey appears to measure what it purports to measure—and not other variables), and content or logical validity (i.e., survey instructions, items, concept of interest, and format appear relevant to and representative of the targeted construct the instrument was designed to measure) (Barlow & Hersen, 1984; Cozby, 2007; Creswell & Plano Clark, 2007; Cronbach, 1990; Gravetter & Wallnau, 2009; Taskakkori & Teddlie, 1998).

Insofar as the objective of applied social science is to improve human functioning in natural, everyday settings, (Barlow & Hersen, 1984; Blaikie, 2009; Moore et al., 2004; Patton, 2001), and given that traditional scientific inquiry tends to label dubious or circumspect mixed-method data-collection strategies grounded concurrently in ontology (i.e., the underlying nature or basis of existence and reality), epistemology (i.e., the nature and achievement of valid knowledge—separating truth from fiction), and philosophical assumptions drawn from positivism (i.e., all knowledge is created by empirical research) and constructivism (i.e., all knowledge is created by empiricism) (Barlow & Hersen, 1984; BonJour, 2010; Brennan, 2001; Brewer & Hunter, 1989; Patton, 2001; Taskakkori & Teddlie, 1998), this study used between-method triangulation (i.e., combining qualitative and quantitative methodologies to elucidate complementary aspects of the same phenomena, enhance interpretive analysis, overcome deficiencies of one method by the strengths of another method, and validate findings) to counteract various intrinsic biases often linked to single-subject design methodology (e.g., limitations surrounding generalizability and transferability of findings) (Barlow & Hersen, 1984; Brennan, 2001; Creswell & Plano Clark, 2007; Greene, 2007; Taskakkori & Teddlie, 1998) and relied upon the PFS to help understand phenomena that would otherwise be enigmatic or confusing by converting qualitative data (i.e., student attitudes, beliefs, reflections, feelings, opinions, perceptions, etc.) into numeric values capable of being quantified and summarized.

Results

Piers-Harris Subscales

On the BEH scale, first-year participants had a mean score of 11.7647 ($SD = 2.1659$), second-year participants had a mean score of 12.7647 ($SD = 1.9852$), and third-year participants had a mean score of 12.2500 ($SD = 1.5706$). Using $p < .05$, the ANOVA yielded an f -value of 1.141, with a two-tailed significance of 0.328; thus, there was no statistically significant relationship or difference between years of participation and BEH mean scores.

On the INT scale, first-year participants had a mean score of 13.000 ($SD = 1.9365$), second-year participants had a mean score of 14.1765 ($SD = 1.9117$), and third-year participants had a mean score of 13.6250 ($SD = 1.9621$). Using $p < .05$, the ANOVA yielded an f -value of 1.571, with a two-tailed significance of 0.219; thus, there was no statistically significant relationship or difference between years of participation and INT mean scores.

On the PHY scale, first-year participants had a mean score of 8.5882 ($SD = 1.6605$), second-year participants had a mean score of 9.0588 ($SD = 0.9664$), and third-year participants had a mean score of 9.9375 ($SD = 1.2894$). Using $p < .05$, the ANOVA yielded an f -value of 4.304, with a two-tailed significance of 0.019; thus, there was a statistically significant relationship or difference between years of participation and PHY mean scores.

Since the ANOVA was significant, post hoc analysis using the Tukey statistical test was performed to clarify which groups among the sample had significant differences. Based upon a critical q value of 2.580, no mean pairs were significantly different.

On the FRE scale, first-year participants had a mean score of 10.1765 ($SD = 2.8336$), second-year participants had a mean score of 10.8824 ($SD = 2.7812$), and third-year participants had a mean score of 12.1875 ($SD = 1.7212$). Using $p < .05$, the ANOVA yielded an f -value of 2.705, with a two-tailed significance of 0.077; thus, there was no statistically significant relationship or difference between years of participation and FRE mean scores.

On the POP scale, first-year participants had a mean score of 8.0588 ($SD = 2.4359$), second-year participants had a mean score of 9.3529 ($SD = 2.2622$), and third-year participants had a mean score of 9.6250 ($SD = 1.5000$). Using $p < .05$, the ANOVA yielded an f -value of 2.614, with a two-tailed significance of 0.084; thus, there was no statistically significant relationship or difference between years of participation and POP mean scores.

On the HAP scale, first-year participants had a mean score of 8.6471 ($SD = 1.5788$), second-year participants had a mean score of 8.9412 ($SD = 1.0289$), and the third-year participants had a mean score of 9.5000 ($SD = 0.8944$). Using $p < .05$, the ANOVA yielded an f -value of 2.102, with a two-tailed significance of 0.134; thus, there was no statistically significant relationship or difference between years of participation and HAP mean scores.

Personal Feedback Survey

Survey responses showed that 83.2 % of first-year participants achieved positive gains in youth development goals linked to MITS programming, compared to 76.3 and 72.1 % for second- and third-year participants, respectively. Also, 94.1 % of first-year participants characterized MITS teaching assistants as *positive role models*, compared to 88.2 and 87.3 % for second- and third-year participants, respectively. Moreover, first- and second-year instruction proved most effective with 88.3 and 79.2 % of participants in those instructional years, respectively, affirming that MITS participation improved their ability to interact with family and peers. Furthermore, when asked to evaluate the utility of MITS at deterring risky behavior by teaching usable life skills, 88.2 % of first-year participants, 82.4 % of second-year participants, and 77.2 % of third-year participants characterized MITS as *very useful*. Overall, when asked whether they would continue attending MITS, 78.6 % of first-year students, 82.3 % of second-year students, and 86.2 % of third-year students answered in the affirmative.

Discussion

Youth development research is fraught with inevitable limitations, and this study was not immune to concomitant problems associated with ontology (reconciling assumptions about how knowledge is obtained, i.e., objective vs. subjective), epistemology (information cogency, i.e., untangling opinion from empirically derived fact), and methodology (data collection and analysis) (Bernstein, 1983; BonJour, 2010; Creswell & Plano Clark, 2007).

When analyzing intervention effect, the preferred scientific design requires random assignment to one of two groups, i.e., control or experimental (Girden, 1992; Gravetter & Wallnau, 2009). However, exposing the experimental group to the intervention while withholding it from the control group would have been unethical, so all study participants received exposure to the same intervention. Also, a larger, varied sample would have improved outcome generalizability, transferability, and reliability (Brennan, 2001; Cronbach, 1990). Usually, a moderate sample size is required to improve the likelihood of obtaining valid *p* values, especially when the population distribution is small, i.e., the power of the ANOVA to detect an effect is greatly diminished if the population distribution is atypical and the sample size small, thick-tailed, or heavily skewed (Girden, 1992; Mosteller & Tukey, 1977).

This study relied upon an omnibus univariate ANOVA test to analyze the interaction between Piers-Harris 2 mean scores and length of Stepping Stones participation. Of six domain subscales, only the PHY scale (corresponding youth development goal: positive self-image) proved to be statistically significant. Though it was disappointing that other subscales did not reveal statistically significant differences or a temporal pattern among responses of first-, second-, and third-year participants, since dance movement possesses the intrinsic power to influence self-image—and given that negative self-image can hinder emotional growth, inspire

self-doubt, reinforce irrational thinking, and impede self-actualization, observing a statistically significant interaction between length of participation and favorable self-assessment of physical appearance certainly supports the existence of a creditable link between positive identity formation and dance movement (Bartenieff & Lewis, 1980; Gallagher, 2006; Jessor & Jessor, 1977; Kimmerle & Côté-Laurence, 2003; Schmais, 2004; Werner & Smith, 1992).

According to survey data, the majority of Stepping Stones participants characterized MITS teaching artists as *positive role models*, indicated MITS was *very useful*, and reported gains in skill areas paired with youth development goals identified by Catalano et al. (2004). This appears to provide compelling evidence regarding the efficacy of dance movement as a viable youth development strategy (Bacon, 2007; Farr, 1997; Gallagher, 2006; Meekums, 2002).

Despite the use of counterbalancing techniques to control for confounding artifacts linked to test–retest fatigue and familiarity, the Piers-Harris 2 and PFS are not immune to variations in scores that can occur from year to year with no distinguishable or explicable reason. Even when multivariate analysis techniques are used to correct for the influence of demographic, environmental, or other extraneous factors (e.g., mediating, latent, exogenous, or moderating variables), an inescapable byproduct of the repeated measure design is that test scores are susceptible to gain or loss fluctuations, usually in response to a bevy of factors linked to an inexhaustible confluence of perpetually changing stressors, perceptions, circumstances, and experiences (Collie et al., 2003; Cranton, 2006; Creswell & Plano Clark, 2007; Cronbach, 1990; Girden, 1992; Gravetter & Wallnau, 2009; Greene, 2007; Mosteller & Tukey, 1977; Shadish et al., 2000; Taskakori & Teddlie, 1998; Weinstein & Roediger, 2012).

Across the United States, policymakers are starting to acknowledge the beneficial effects of youth development programs: reducing risky behavior and enriching the lives of young people (Catalano et al., 2004; Farr, 1997; Hall & Gruber, 2007; Howell, 2003; Moore et al., 2004). While research data affirm that youth development programming is an effective community-based tool to reduce crime, enhance social function, and narrow the achievement gap between low- and high-income youth, an alarming number of U.S. youth are not participating (Dryfoos, 1990; Durlak & Weissberg, 2007; Howell, 2003; Moore et al., 2004). Moving in the Spirit creates a supportive milieu expedient for learning essential life skills, and relies upon evidence-based theoretical constructs and dance movement to foster resilience (i.e., the ability to manage rejection, failure, and disappointment in prosocial ways), social competence (i.e., the ability to resolve conflict through interpersonal skills that rely on logic), cognitive competence (i.e., the ability to integrate self-awareness, intrapersonal dialogue, and critical thinking), emotional competence (i.e., the ability to delay gratification, analyze feedback, ask for help, and interpret stimuli), and behavioral competence (i.e., the ability to effectively use empathy, tolerance, and assertiveness).

Appendix

Participant Feedback Survey for Moving in the Spirit (MITS)

Class: Stepping Stones

Participation Year (circle): First Second Third

We want to know your opinion. Please circle or bubble in the answer that best describes your belief. Since this survey is confidential, please do not sign your name.

How much do you agree with the following statements? (one answer per statement)

At Moving in the Spirit...

	Agree	Disagree	No Opinion
1. goals and expectations are clear	1	2	3
2. staff respond to my concerns and questions	1	2	3
3. staff is never too busy to help	1	2	3
4. staff respect me and my family	1	2	3
5. teaching artists are positive role models	1	2	3
6. teaching artists help with real-life issues	1	2	3
7. teaching artists are skillful dance instructors	1	2	3
8. teaching artists encourage and support	1	2	3

Did MITS help in the following areas? (one answer per statement)

	None	Little	Greatly
9. Thinking about career possibilities	1	2	3
10. Achieving short- and long-term program goals	1	2	3
11. Improving my interaction with family and peers	1	2	3
12. Understanding how my behavior affects others	1	2	3

13. Planning and completing educational goals	1	2	3
14. Learning how to express feelings appropriately	1	2	3
15. Exploring the dangers of alcohol and drugs	1	2	3
16. Learning safe recreational activities	1	2	3
17. Managing negative peer pressure	1	2	3
18. Learning how to better my community	1	2	3
19. Learning age-appropriate social skills	1	2	3

Also...

20. How useful is MITS at teaching life skills? ☐ Very ☐ Somewhat ☐ Not
21. How helpful is MITS at teaching dance? ☐ Very ☐ Somewhat ☐ Not
22. Will you continue attending MITS? ☐ Yes ☐ No ☐ Maybe
23. Will you pursue dance outside of MITS? ☐ Yes ☐ No ☐ Maybe
24. Would you like your parents to be involved at MITS? ☐ Yes ☐ No ☐ Maybe

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