

Research into Practice: Feature Article

Sport Motivation Questionnaire for Persons with Mental Retardation

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This study investigated the psychometric properties of a Sport Motivation Questionnaire (SMQ) for persons with mental retardation. The SMQ was administered to 147 Special Olympics athletes, aged 21–70 years. The SMQ contained 14 paired participation motives. Content experts and principle component factor analysis evaluated validity evidence of the SMQ. Five factors were extracted including (a) task orientation, (b) social integration, (c) fitness, (d) team orientation, and (e) social affective for 61% of the total variance. Reliability evidence was examined by test-retest and internal consistency. Test-retest reliability using intraclass correlation ranged from .50 to .98. Internal consistency of the SMQ employing Chronbach's alpha ranged from .50 to .98. Results provide preliminary support for the SMQ for persons with MR.

KEY WORDS: *Special Olympics, Cognitive Impairment, Measurement*

Achievement goal theory (Nicholls, 1984, 1989) is one of the most popular theoretical perspectives from which to address motivation in sport and physical activity. Achievement

goal theory assumes that a person's individual achievement goals govern achievement beliefs and guides behavior in achievement settings. To understand motivation of people, it is im-

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portant to know *why* one is in the achievement context (Roberts, 2001). According to achievement goal theory, the driving force behind achievement behaviors is the demonstration of competence.

Nicholls (1984, 1989) outlined two conceptions of ability, task and ego. In a task-oriented conception of ability, the demonstration of competence is achieved through learning, improving, and task mastery. Task oriented individuals participate in sport to *improve ability, test oneself against ones own standards, and because of the excitement of the activity* (Brasile & Hedrick, 1991). In the ego conception of ability, competence is based on the comparison of one's skill with others. Ego oriented people report playing sports to *win, compete against others, compare oneself to others, and to get recognized for their ability* (Brasile & Hedrick). Maehr and Nicholls (1980) argued for a third conception of ability, social incentives. The social incentive conception of ability is demonstrated through the establishment of relationships and recognition received from significant others. Individuals in this latter group report participating in sports as it *gives them a chance to be with friends, offers opportunities for travel, and because it pleases those who are close to them* (Brasile & Hedrick). Brasile (1989) found two additional factors to be related to participation motivation including fitness and social affective incentives. While athletes have multiple reasons for participating in sport, most achievement goals can be grouped into one of these three (task, ego, social) conceptions of ability. Variations in these conceptions are fundamental to observing differences in people's achievement related motives.

Little is known about achievement goals of individuals with mental retardation (MR). Given the cognitive nature of achievement goal theory, the lack of theoretical application to athletes with MR is largely because of measurement difficulties (Sherrill, 1997). Several measurement scales have been used to assess perceptions of competence and achievement motivation in persons with and without

MR. Likert type scales in which both magnitude and confidence are assessed is a traditional way to assess motivation (Maurer & Andrews, 2000). The complexity of such scales, however, prevents the accurate assessment of achievement goals of individuals with MR. Individuals with MR tend to be unable to differentiate the importance of the items (Shapiro, 2003). On the basis of responses, participant's cognitive ability to determine and respond to the reasons for participation needs to be separated from the cognitive processes subsumed under a response format of determining magnitude of importance of the respective motives (Shapiro). A second factor influencing responses of persons with MR on Likert scales is the use of anchoring labels. Regardless of whether the labels are related to all points along a scale or simply to the two ends, individuals with MR demonstrate difficulty remembering the various descriptors and may interpret meanings assigned to response options differently (Chang, 1997).

A modification of the Likert scale was the structured alternative question format developed by Harter (1982). A pictorial version using the same format was designed for younger children by Harter and Pike (1984) and subsequently modified by Ulrich and Collier (1990) for the athletic domain. Using this format, the respondent was asked to decide which kind of person they are most like, those described on the right or left side of the page. Once having made this decision, the respondent decides if the description is *sort of true* or *really true* for them. While this question format legitimizes either choice, individuals with MR appear to experience difficulty in deciding the magnitude to which the description reflects perceptions of themselves. A variation of the Likert scale is the semantic differential scale. A semantic differential scale uses adjective pairs, with each adjective as an end anchor in a single continuum. On a semantic differential scale there is no need for a series of descriptors. Rather one word or phrase is placed at either end. The scale is used to elicit descriptive reactions toward a concept, is easily con-

structured and can be completed quickly (McMillan & Schumacher, 1997). This format presents an appealing option to evaluate responses of persons with MR on a variety of topics such as responses of students towards school, affect, and sport participation motivation.

Several alternative options to the Likert and structured alternative format have been examined. These include the visual analogue scale, varied shapes, and happy faces formats. It was believed that illustrations facilitated understanding of question content and reduced demands on expressive verbal abilities by allowing nonverbal responding (i.e., pointing to a picture) (Sigelman & Budd, 1986). However, pictures did not reduce the tendency toward acquiescence, defined as the tendency to respond affirmatively to questions regardless of their content (Sigelman, Budd, Spanhel, & Schoenrock, 1981). Similarly, instruments requiring yes or no responses were found to be weak because individuals with MR acquiesce for the last option in either/or and multiple choice questions and tended to respond with a yes in yes/no questions (Sigelman & Budd; Sigelman et al.). Acquiescence was most influential when the question was not understood, or possibly when the correct answer was unknown or not very accessible, or when the questions were worded so that the yes response indicated participation or appropriate actions (Sigelman et al.). Acquiescence not only can distort impressions of a group drawn from interview data but also may obscure the relationships between topics of inquiry (Sigelman et al.).

The issue of assessment is paramount. If measurement instruments are not sensitive to the self-evaluations of individuals with MR, questions involving perceptions of competence and motivation for sport participation cannot be meaningfully addressed (Silon & Harter, 1985). To assess sport participation motives of athletes with MR, sport psychology researchers need to develop instruments that are developmentally appropriate for persons with MR. Identifying athletes' achievement

goals for sport participation provides valuable information about the opportunities and outcomes sought from sport. Such information can be used by sport personnel in structuring athletic environments to provide participants with maximally rewarding experiences (Passer, 1982). There are currently no instruments assessing achievement goals among individuals with MR in sport settings. The purpose of this study was to describe the development of the Sport Motivation Questionnaire (SMQ) for people with MR and to establish validity and reliability of the SMQ.

Method

Defining Content Relevance

Content relevance refers to the degree to which the content contained within the survey (i.e., the individual questions) represents the primary construct for which the items were designed to measure (Dunn, Bouffard, & Rogers, 1999; Yun & Ulrich, 2002). Each of Crocker and Algina's (1986) four steps to providing content related evidence (defining the domain of interest, selecting a panel of judges, having the judges evaluate the instrument based on specific criteria, and summarizing the information and/or selecting appropriate items) was followed in this investigation. Achievement goals for sport participation was defined as the reasons/motives athletes with MR participate in Special Olympics sports programs. Literature in youth and adult sport, disability sport, physical education, and special education was reviewed to generate reasons for sport participation. Individual reasons were selected if they (a) were included on previously established instruments in youth, adult, and/or disability sport participation surveys, (b) reflected the uniqueness of Special Olympics and/or could be observed in Special Olympics sports programs, and (c) were appropriate for younger and older adults with MR. This resulted in the selection of 34 reasons or motives for participation in Special Olympics traditional sports programs.

Composition of Panel of Expert Judges

Yun and Ulrich (2002) pointed out the importance of understanding the make-up of the experts evaluating the instrument to better appreciate the content selected. For the present study, a panel of experts reflecting different aspects of the disability sport movement was selected to evaluate the SMQ. The following judges were selected in accordance with the recommendation by Yun and Ulrich (2002) and Dunn and colleagues (1999) to include a diverse group of individuals. Judges included coaches (n = 2), parents (n = 1), administrators (n = 1), university professors involved with disability sport (n = 2) and university professors in special education with expertise in working with persons with MR (n = 2). The coach had 20 years of experience coaching Special Olympics. The parent had children in Special Olympics for a minimum of 10 years, and the administrator worked in program development at the state Special Olympics office. One university professor involved with disability sport had a Masters degree and was a certified therapeutic recreation specialist. The remaining professor in disability sport and the two professors with expertise regarding persons with MR all had a Ph.D in their respective fields. Given the difficulty in finding experts who understand the entire domain of achievement motivation among persons with MR, essential content areas were a priori identified (e.g., achievement motivation, individuals with MR, Special Olympics). Experts understood one or more of these areas (Yun & Ulrich, 2002). A total of eight judges were used, three more than the recommended minimum number of 5 needed to control for chance agreement among raters (Dunn et al.).

Rating Scale Procedures

The content experts examined the 34 reasons by commenting on their appropriateness for Special Olympics athletes with mild mental retardation 20 years of age and older, and suggested additional motives athletes with MR

may have for participating in Special Olympics traditional sports programs. Experts were asked to indicate (yes, no, uncertain) whether each reason was relevant for Special Olympics athletes, 20 years of age and older. For an uncertain or no response, experts were asked to provide an explanation. The same experts also reviewed the appropriateness of the wording of the reasons. Word appropriateness was defined as the suitability or fittingness of the wording for persons with mild or moderate MR, 20 years of age and older. The experts were asked to consider whether a person with MR would be able to understand the reason and reflect on the meaningfulness of that reason for their personal involvement in Special Olympics sports. Experts were asked to indicate on a 5-point scale anchored with *not at all appropriate wording* (1) to *extremely appropriate wording* (5), their perception of the appropriateness of the wording for athletes with MR. For items rated 3 or lower experts were asked to provide alternative phrasing.

Evaluating Judge's Ratings and Item Development

Based on expert feedback, two reasons from the original list of 34 were eliminated (e.g., *my teachers want me to play, like to stay in shape*). Given that participants in this study were no longer in school the reason *my teachers want me to play* no longer served as a reason for participation. *To stay in shape* was eliminated as it is similar to another question *to get in shape* and experts commented on the possible confusion between *get in shape* and *stay in shape*. Experts recommended an additional five reasons be added to the instrument (e.g., *like the clothing/uniforms, like the banquets and dances, like the coaches, the coaches like me, and I already know how to play*) resulting in a total of 37 reasons for participation in Special Olympics. Based on expert's ratings of word appropriateness, 21 of the 37 reasons were restated.

Several of the questionnaire formats described above (i.e., structures alternative for-

mat, various size circles and starts, semantic differential scale) were pilot tested using the 37 reasons. Given the length of time it took to complete a survey of 37 items and the corresponding attention span of athletes, the total number of items was reduced to 14. The 14 items were selected in accordance with the recommendation of Brasile, Kleiber, and Harnisch (1991) that using the strongest motives is the most beneficial and economical approach. The 14 reasons selected represented the seven most and seven least important reasons for participation in sport based on previous research findings on sport motives in youth, adult, and disabled sport (Brasile & Hendrick, 1991; Brasile et al.; Gill, Gross, & Huddleston, 1983; Gould, Feltz, Horn & Weiss, 1982; Klint & Weiss, 1987; Yarwasky & Furst, 1996). Of these 14 motives, four had word appropriateness ratings below three out of four and were reworded. A total of four items had ratings of 3.2–3.8 with five items having ratings of 3.8 and higher.

Participants

The *Sport Motivation Questionnaire (SMQ)* was administered to 147 athletes with MR between 21 and 70 years of age. A total of 80 men (M age = 34.19 years, SD = 10.38) and 67 women (M age = 32.82 years, SD = 10.76) participated. Athletes were recruited from nine Special Olympic Sports including basketball (N = 36), bowling (N = 51), floor hockey (N = 7), gymnastics (N = 11), power lifting (N = 11), table tennis (N = 3), tennis (N = 15), track and field (N = 2), and volleyball (N = 11). Eligibility to engage in Special Olympics is based on a formal assessment by an agency indicating that the athlete has one of the following conditions: (a) mental retardation, (b) cognitive delays, or (b) significant learning or vocational problems due to cognitive delay that require or have required specially-designed instruction (Special Olympics, n.d.). All athletes in the present study were involved in Special Olympics traditional sports programs in a southeastern state. Ath-

letes and/or their parents reported amount of time involved in Special Olympics sports programs ranged from a minimum of 2 years up to 25 years. A total of 30 athletes (male = 12, female = 18) were identified as having Down's syndrome. Five athletes had additional disabilities including cerebral palsy (N = 4) and hearing impairments (N = 1). Given that Special Olympics sports programs apply to all Special Olympics athletes including people with multiple disabilities, the inclusion of these latter athletes has the potential to enhance generalizability of the results. A total of 75% of the males and 85% of the females were Caucasian, while 23% of the males and 14% of the females were African American. Participants were recruited from group homes, sheltered workshops, and county recreation departments.

Instrument

Sport Motivation Questionnaire (SMQ). As described in the item development section, the SMQ was developed by the primary investigator as a 14 item semantic differential scale. Using this format, motives were paired. Each reason was paired with every other reason so that each reason was presented 13 times throughout the questionnaire (e.g., motives 1 and 2, motives 1 and 3, motives 1 and 4, motives 2 and 3, motives 2 and 4, etc . . .) for a total of 92 matches. The primary investigator read each set of paired motives aloud to each participant individually. The stem for each question was "Do you play sports in Special Olympics to . . . or to A sample question would be as follows. Do you play sports in Special Olympics to win ribbons or medals or to have fun?. The next pair of motives may read Do you play sports in Special Olympics to be with friends or to travel?. For each pair of reasons participants marked the one most important to them. Presentation of the matched motives was randomized to limit any potential order effect. In addition, to improve validity, the sequence of the motives was changed such that each motive was presented both first and

second in its match reducing the tendency of participants to choose the last alternative presented and allowing the interviewer to determine if athletes had a response bias based on the positioning of the option (Dattilo, Hoge, & Malley, 1996). Following administration of the SMQ, the number of times out of 14 each reason was marked by each participant was summed. The larger the number the more that participant felt the reason was important to him/her. Conversely, the lower the number, the less important that reason was to the participant's involvement in Special Olympics.

Data Collection Procedures

Permission was attained from the state Special Olympics office to conduct the present investigation. The state office assisted in the identification of Special Olympics coaches from across the state. Coaches were contacted, provided with an explanation of the nature of the study, and asked permission to attend their training sessions to interview athletes. A consent form was signed by all willing participants. The interviewer began the interview by spending a few minutes conversing with the athlete to establish a positive rapport (Dattilo et al., 1996). The interviewer told athletes there were not right or wrong answers, encouraged them to be honest and reassured them their responses would be confidential. The primary investigator placed the questions in front of the athlete and read each pair of motives out loud. Once an answer was given the interviewer asked participants to put a check or an "X" next to the motive. Athletes were interviewed individually in a quiet room away from their coach and teammates. Completion of the SMQ took approximately 20 minutes. At the completion of the interview, the interviewer thanked the athlete for participating, complimented them on their ability to share their thoughts and walked them back to where their team was practicing.

A total of 54 athletes were randomly selected to complete the questionnaire a second

time to establish test-retest reliability. The number of practice sessions attended by the primary investigator ranged from one to six depending on the number of athletes on a given team who completed the questionnaire and/or on the number of persons per team who completed the questionnaire a second time.

Data Analysis

Responses to the SMQ were calculated using mean ratings for each of the 14 items. Exploratory principle component factor analysis with varimax rotation was used to determine the grouping of the individual items. The SAS program for Windows was used for this calculation. Cronbach's alpha was used to determine the degree to which the items in the respective categories were related. Test-retest reliability was estimated by intraclass correlation using a two-way ANOVA using SAS for Windows.

Results

Validity Evidence

Content relevance was established by determining whether the instrument included items that were representative of reasons for sport participation by athletes with MR. The literature review, instrument review, and use of a panel of experts (Missiuna, 1998) was described in an earlier section. The SMQ does not purport to measure all possible motives athletes with MR may have for participating in Special Olympics sports. Rather, the SMQ is intended to measure the most important reasons for sport participation identified in the youth, adult and disability sport literature (Missiuna).

An issue similar to but not identical to content validity is face validity. Face validity relates to the general appearance of the survey (Crocker & Algina, 1986). Messick (1993) suggested that establishing face validity should not be completely abandoned. Face validity was critical to establish when working

with persons with MR as it affected participant's cooperation, motivation, as well as possible public acceptance of the results (Messick; Yun & Ulrich, 2002). Additionally, face validity may motivate participants to provide truthful responses as the test appears to measure a meaningful construct (Crocker & Algina). The methods used to develop a survey that was developmentally appropriate for athletes with MR were a challenge. The strategy of using a semantic differential format posed no problems with its administration. Respondents appeared to have no difficulty understanding or responding to items with individual differences being observed.

Construct validity is the collection of empirical evidence to support the existence of the theoretical construct underlying the measurement and the resulting inferences (Burton & Miller, 1998). Principle component factor analysis with varimax rotation yielded five factors accounting for 61% of the total variance. Generally, the individual items were grouped together in logical factor patterns. Factor 1 included items representing task oriented motives. Specific reasons on this factor included to improve skills, to feel relaxed, and to win ribbons and medals. Factor 2 included items related to social integration (fun, travel, be popular, try something hard, parents and friends want me to play). To get exercise was the sole reason for Factor 3 labeled fitness. Items loading on factor 4 related to team orientation (do something I'm good at, play with others, feel important). Social affective motives dominated Factor 5 (to smile and laugh and get out of the house). Factor loadings across all five factors ranged from .43 to .87 (see Table 1). All items loaded on their respective factor with no items loading on more than one factor suggesting that each item on the common factor measures the same construct. Additionally, the number of factors identified is congruent with the theoretical rationale of achievement motivation theory. Together the factor pattern and its theoretical congruence provide evidence of construct validity (Messick, 1993; Yun & Ulrich, 2002).

Table 1.
Factor Analysis Results

Motives	Factor Weights
Factor 1: Task-oriented motives	
To improve my skills	.60
To do things that make me feel relaxed	.75
To win ribbons and medals	.68
Factor 2: Social Integration motives	
Parents and friends want me to play	.65
To have fun	.64
To be popular	.47
To go to new and different places	.61
To try something hard to do	.67
Factor 3: Fitness oriented motive	
To get exercise	.77
Factor 4: Team orientation motives	
To do something I'm good at	.68
To play with other people on my team	.77
To feel like an important person	.43
Factor 5: Social affective motives	
To get out of the house	.44
To smile and laugh	.88

Reliability Evidence

To examine the internal consistency of the SMQ, Cronbach's alpha reliability coefficients were calculated. Cronbach's alpha for factors 1, 2, 4 and 5 were .80, .98, .50, and .64 respectively. Given that Factor 3 had only one item, its internal consistency could not be determined.

Test-retest reliability of the SMQ was estimated from testing 54 athletes (male = 21, female = 33) two times within a 3-week period. Athletes completed the second questionnaire in the same sport in which the first survey was completed. Results indicated agreement between responses on the first and second interview sessions for each item indi-

vidually, for each factor, and for the total test. Intraclass correlation coefficients for each item ranged from .52 to .90. Test retest for the total battery was .96. Correlations for factors 1, 2, 4, and 5 were .65, .53, .51, and .69 respectively.

Discussion

Few people with MR have the reading or writing skills necessary to complete a research questionnaire. Many persons with MR, however, have the communication skills needed to answer appropriately stated interview questions (Dattilo et al., 1996). Professionals working with persons with MR are increasingly seeking the opinions of persons with MR giving them opportunity to speak for themselves in a meaningful way (Sigelman et al., 1981). The procedures used in this paper illustrate techniques to increase confidence in the validity and reliability of responses from participants with MR for self-evaluation instruments.

The objective of any modified test is to eliminate, as much as possible, sources of difficulty that are irrelevant to the construct being measured (Geisinger, 1994). Such modifications may differ in substantive ways that have clear psychometric implications (Geisinger). It is critical that researchers attempt to perform validation studies whenever a test is modified or extended to a new modality. The more different the version from the traditional format the greater the need for revalidation (Geisinger). With this in mind the present investigation was conducted to describe the development of the SMQ and establish validity and reliability.

Validity is an integrated evaluative judgment of the degree to which empirical evidence and theoretical rationales support the adequacy and appropriateness of inferences based on test scores (Messick, 1989, 1995). Scores are a function not only of the items but also of the persons responding and the context of the assessment. What needs to be valid is the meaning or interpretation of the scores as well as any implications for action associated

with score interpretation (Messick, 1989, 1995).

The clarity with which items in the present investigation loaded on dimensions or categories operationally defined in accordance with achievement goal theory (task, ego, social orientations) reduces any possible impact of interviewer bias, enabling the researchers to corroborate the existence of multiple motives for sport participation among athletes with MR. The youth sport and disabled sport literature highlights task orientation motives including *to improve ability, test self against ones own standards, perform skills of the activity, and like the challenge the activity provides* (Brasile & Hedrick, 1991; Brasile et al., 1991; Gill et al., 1981; Klint & Weiss, 1986; Ryckman & Hamel, 1993). The grouping of motives on the task orientation dimension was similar for athletes with MR, youth sport athletes, and athletes with physical disabilities with one exception. In the present investigation *to win ribbons and medals* loaded as a task oriented motive. This differs from the literature in that winning generally is aligned with ego-oriented motives such as *getting recognition, competing against others, and winning*. Given this discrepancy, it is important to consider the sport context. In Special Olympics state and national competitions all athletes who participate win a ribbon or a medal. For Special Olympics athletes winning ribbons and medals likely represents a task orientation in which coaches and athletes perceive an emphasis on the accomplishment of personally relevant goals, effort, and improvement rather than on winning and success (Shapiro, 2003). This type of mastery focus allows all participants to experience success (i.e., win ribbons and medals) regardless of their relative skill and abilities.

The grouping of motives on the social integrative dimension for Special Olympics athletes with MR is consistent with that reported in the literature for athletes with physical disabilities (Brasile & Hedrick, 1991; Brasile et

al., 1991). Examples of social integrative motives from the literature that were consistent with those of athletes with MR include *pleasing parents and friends, offers opportunity to travel, and opportunity to make new friends* reflecting the notion of popularity. Motives on the social affective dimension articulated in the literature include relaxation, release of frustration and enjoyment (Brasile & Hedrick; Brasile et al.). With the rewording of *to release frustration to smile and laugh* in the present investigation, the grouping of social affective motives for Special Olympics athletes was consistent with the literature.

Lastly, motives on the team orientation factor are described in sport literature to include *like the team spirit, like being on a team, and like the teamwork* (Ryckman & Hamel, 1993). Special Olympics athletes also reflected on their desire to play with people on their team and on how such participation makes them feel important. Overall, observed factor patterns of motives for sport participation among Special Olympics athletes are valid given the consistency with the philosophy and actions of Special Olympics and achievement motivation theory.

With regard to reliability of the SMQ, internal consistency for all scales ranged from good to very good (Missiuna, 1998). The overall high correlations between responses on the two testing sessions provides support for the ability of athletes with MR to consistently describe their reasons for participating in Special Olympics sport programs (Dattilo et al., 1996).

Directions for Future Research

Given the heterogeneity of persons with MR, it is critical that research methodologies continue to focus on ways to increase the generalizability of results. Results of the present investigation are generalizable to the sport participation motives of other Special Olympics athletes due to the diversity of participants (e.g., age, race, gender, sport) interviewed (Shapiro, 2003). The current version of the SMQ should be considered a preliminary

step in the development of a participation motivation measure for athletes with MR. Although the initial information obtained with the questionnaire is encouraging, considerable psychometric work is needed before items or factors identified in the present study and/or additional items/factors can be accepted as reliable, valid and comprehensive as a measure of participation motivation of Special Olympics athletes with MR. One possible step in modifying the questionnaire is to balance the number of items associated with the different factors and to make sure all items within a factor are logically related. Other strategies to increase validity of score interpretations include (a) accompanying questions with pictures, (b) using closed and open-ended questions, (c) building in checks for response bias, and (d) supplementing participant interviews with those of coaches and parents (Dattilo et al., 1996). The precision and accuracy of results obtained from instruments using a combination of approaches can increase the ability to develop sport programs that address the reasons athletes have for participation. Lastly, to further establish construct validity of the SMQ researchers should investigate the extent to which the SMQ's factors relate to other measures of achievement motivation such as actual competence, perceived importance, and perceived value of the sport. In this way the meaning of the motives identified in the present investigation can be substantiated through examining their degree of empirical relationships.

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