Explaining Physical Activity in Individuals with Mental Retardation: An Exploratory Study

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Abstract: This study investigated physical activity patterns of seven adolescents with mental retardation over a seven day period. Further, motivation, fitness levels, physical activity of one caregiver, and parent interview responses were triangulated to study this select group. Results indicated that two main factors explained physical activity in participants. A very large relationship existed between age and minutes of moderate physical activity and social reasons emerged as a key theme during caregiver interviews. Intrinsic motivation scores were high and amotivation scores were relatively low in the sample. Physical activity data resulted in 6 to 14 bouts of moderate physical activity per day lasting from 2 to 4 min depending on the case. This pattern of short periods of moderate physical activity is consistent with results from similar studies on children without disabilities.

Physical activity and the health related benefits of movement have been a focus of many recent government and educational reports. Specifically, recommendations for physical activity are that all persons (ages 2 and older) should incur at least 20 minutes of activity at moderate intensities on all days of the week (US Department of Health and Human Services, 1996). These recommendations, though not specific to individuals with disabilities, may hold true for healthy individuals with mental retardation (MR). Further, age related changes in persons with MR with respect to fitness indicate that response to exercise is similar to peers without disabilities although there is an increased need for movement given lower levels of fitness that exist in this target group in general (Rimmer, 1999; Seaman, 1999). This study contains exploratory information on activity levels, the utility of activity monitors, motivation, and health related fitness in a select group of persons with MR.

Inactivity in Persons with MR

Inactivity has become a major public health concern for individuals at all ages (US Department of Health and Human Services, 1996). Formal and informal physical education programming can play a major role in enhancing activity in learners, including children with disabilities. Physical activity has the potential to reduce health risk factors and positively affect other physiological subsystems in the body during certain critical developmental periods. Adults with MR are at a heightened risk for factors related to inactivity, such as cardiac disease, obesity, high cholesterol etc. (Carter & Jancar, 1983; Pitetti & Campbell, 1991). Few studies have been done investigating physical activity patterns in individuals with MR and their caregivers. Further, although relationships between motivation and physical activity are believed to exist (Roberts, 2001); study of specific physical activity patterns in individuals with MR is needed to isolate specific reasons for low fitness levels in this population (Winnick & Short, 1999). The purpose of this study is to determine what types of variables potentially exist beyond school programming factors that may be in need of further study.

Individuals with MR from community settings have been shown to be even less active than persons from institutional settings (Pitetti & Campbell, 1991). One reason for this latter finding may be that individuals with MR from community settings are not adept at independently accessing recreation options within the community (McDonnell, Hard...
man, Hightower, Keifer-O’Donnell, & Drew, 1993). With this in mind, Modell and Valdez (2002) recommend an increased attention to transition planning for individuals with disabilities to enhance post school living and general quality of life.

Measuring Physical Activity in Individuals with Disabilities

Measuring physical activity levels in children and adults has received considerable attention in recent research reports. In this regard, use of self-report questionnaires to measure activity has limitations for all persons and specifically for special populations (Hatcher, Porretta, & Kozub, 1996; Jakicic et al., 1998). Due to limitations of using self-report questionnaires, observational information/coding (Ainsworth et al., 1992; O’Hara, Baranowski, Simmons-Morton, Wilson, & Parcel, 1989) and physical activity monitors are considered viable alternatives (Jakicic et al.; Welk & Corbin, 1995; Welk, Corbin, & Kampert, 1998). Most recently, Freedson and Miller (2000) indicated the small and unobtrusive nature of the monitor’s motion sensors make it a useful tool in assessing movement. For this reason, the most recent RT3 monitors were utilized in the current study over self-reports, which tend to have lower estimates of validity for younger populations (Sallis & Saelens, 2000).

Motivation and Physical Activity

Intrinsic motivation for physical activity is associated with pleasure and enjoyment. This willingness to participate in movement for pleasure or satisfaction (Reid, Vallerand, & Poulin, 2001) can result from perceptions of freedom or in the case of individuals with disabilities the opportunity to make choices (Wehmeyer, 1994). Extrinsic motivation on the other hand deals with the issue of external rewards such as praise or perhaps tangible rewards from others. In this regard individuals with MR are believed to be highly extrinsically motivated based on past reinforcement histories. In fact, many special education programs rely heavily on external rewards for a child’s compliance or success in academic areas (Cohen, 1986; Wehmeyer). Amotivation is a third category of motivation outlined by adapted physical activity researchers who try to explain movement in special populations (Reid et al.). Amotivation is related to participation without a purpose. In amotivation, a person may experience what is termed “learned helplessness.” Learned helplessness is linked to low persistence at challenging motor tasks and a perception of external control (Martinek & Griffith, 1994; Siegel, 1979).

Motivation is a complex phenomenon. In learners without disabilities simple enjoyment of physical activity predisposes a child to movement in different contexts. However, based on the poor ability of individuals with MR to learn and generalize skills (Krebs & Block, 1992; Rarick, 1980; Vaughn, Bos, & Lund, 1986), this assumption may not hold true for learners with unique motor needs. For this reason it is important for researchers to study motivation in conjunction with physical activity to determine if a profile exists that explains inactivity.

Health-Related Fitness and Physical Activity

Although it has been found that adolescents with MR are less fit on virtually all measures of health-related fitness (Winnick & Short, 1999), the exact cause for low fitness scores is most likely due to multiple factors. Research reports have found that as a group, individuals with disabilities have less opportunity than non-disabled peers to engage in sports programs (Kozub & Porretta, 1998). Further, children with MR have been found to be less persistent than peers without disabilities, which may explain low skill levels and impact on fitness scores (Kozub, 2002). Low fitness coupled with low skill perhaps leads to inactivity in persons with MR. However, some adapted physical educators have suggested that more dynamic systems such as family interactions may play a role in explaining inactivity in persons with disabilities (Fiorini, Stanton, & Reid, 1996; Kozub, 2001). For this reason, motivational factors alone may not explain inactivity and low fitness found in persons with MR.

The purpose of this study is to utilize data triangulation procedures to explore physical activity patterns in adolescents/young adults with MR. The small group of participants were
studied using multiple data collection procedures to gain deeper understanding than would be obtained from simply studying activity levels in a larger sample. Further, motivational factors, parent activity patterns, and fitness variables were used to help explain physical activity in a select group of participants.

Method

Participants

All participants had a primary disability classification of MR made by the cooperating North Eastern school district. One participant had just exited his formal education and had been classified as an adolescent with MR by his former school district. No participant had any known medical or physical limitations that would affect physical activity participation. Below are key demographics for each case.

Participant 001. This 18-year-old female, was 4 feet 8 inches tall and weighed 126 pounds at the time of data collection. Her mother indicated that the family’s monthly income exceeded 2,500 dollars. No intelligence or adaptive behavior scores were available.

Participant 002. This 25-year-old male was not currently enrolled in school, nor did he have a job at the time of the study. He lived at home with his biological parents and his mother took part in the physical activity data collection. He was 5 feet 6 inches tall and weighed 136 pounds. An intelligence score of 68 was recorded during his last educational testing. No adaptive behavior scores were available. Combined monthly income for this family was between 1,250 and 1,664 dollars.

Participant 003. This 16-year-old male was enrolled in special education classes at a large rural school district. His mother took part as the parent or caregiver wearing the RT3 unit. He was 4 feet 8 inches tall and weighed 126 pounds. The school district personal director reported an intelligence quotient of 45 and an adaptive behavior score of 35. No information was provided on specific instruments used to assess these factors. Although these measures indicate low cognitive and functional skills, this child did not appear to have any issues with independence or communication during study activities. Combined monthly income of this two-parent household was between 1,665 and 2,079 dollars.

Participant 004. This 14-year-old female was 5 feet 4 inches tall and weighed 119 pounds at the time of the study. Her mother took part by wearing the RT3 units on two occasions; however, no usable data was yielded for this caregiver during either period due to instrument malfunction. Combined monthly income for this family exceeded 2,500 dollars. An intelligence score of 55 and an adaptive behavior score of 54 was provided by a school official.

Participant 005. This 13-year-old male appeared to be the highest functioning of the sample based on subjective perceptions gathered during testing. At 5 feet 4 inches tall, he weighed 70 pounds at the time of the study. No educational testing scores were available. He was currently enrolled in a segregated educational placement for children with MR. This participant’s father wore the RT3 unit during the study. Fitness testing was not completed on this participant due to conflicts in scheduling between the family and investigators. The father reported that he was not currently employed so he could not answer the question related to combined monthly income.

Participant 006. This 21-year-old female was finishing up her last year of public education. She was 5 feet 3 inches tall and weighed 232 pounds. Her mother took part in the study, and the family combined monthly income exceeded 2,500 dollars per month. An intelligence quotient of 56 and no adaptive behavior scale scores were reported.

Participant 007. This 14-year-old male was 4 feet 5 inches tall and weighed 61 pounds. His father was involved in the study. The participant was enrolled in a fifth grade general education placement at an elementary school. This child’s parent reported an intelligence quotient of 67 with an adaptive behavior score of 68. Combined family income exceeded 2,500 dollars.

Instrumentation

RT3 monitors. To date no known published studies have utilized the RT3 activity monitors on individuals with MR. Prior studies have utilized a similar earlier model which gave estimates of movement in three activity...
planes referred to as the TriTrac R3D. The TriTrac R3D was successfully used by Hatcher et al. (1999) in a study to determine physical activity levels in adults with intellectual disabilities over extended periods of time. Hatcher et al. had participants wear units over a seven-day period and meaningful data were retrieved using this instrument. Relative to use of the TriTrac R3D as a measure of activity, researchers have demonstrated promising estimates of validity for both long and short bouts of movement (Jakicic et al., 1998; Welk & Corbin, 1995; Welk et al., 1998).

Kalakanis, Goldfield, Paluch, and Epstein (2001) utilized this older version of three plane activity monitors, referred to as the TriTrac R3D, successfully in a study of obese children and determinants of physical activity. Along with this study the current researcher conducted pilot work to determine if the newer RT3 was able to accurately compare to a known observation system during short bouts of physical activity. In this study of older individuals with MR, adequate estimates of validity for the RT3 were obtained by showing a .76 correlation between the 97 intervals of physical activity during pilot study of fitness testing videos and the CPAR activity ratings.

Intrinsic motivation scale. Reid et al.’s (2001) Pictorial Motivation Scale was used to assess levels of motivation towards sport by persons with MR. This scale has been found to have adequate estimates of reliability and validity. One of four subscales of this instrument includes intrinsic motivation or participating for the fun or satisfaction of an activity. Second, identified regulation is a form of extrinsic motivation where a person engages in activity out of choice with the hopes of achieving a valued end. Third, external regulation is a form of extrinsic motivation highlighted by participation based on a reward regulated by an external means such as a teacher. Finally, amotivation refers to the lack of motivation to participate (Reid et al.).

Brockport Physical Fitness Test (BPFT). Winnick and Short (1999) developed the BPFT specifically for special populations. This source provides appropriate criterion-related fitness values for individuals with MR that have been tested for validity and reliability. The pacer, skin fold, modified curl up, and sit and reach values were obtained for participants using the protocol developed by Winnick and Short.

Children’s Physical Activity Form. To obtain an initial estimate of validity for the RT3 units, a concurrent investigation was conducted by coding video collected during fitness testing for 5 participants and using the Children’s Physical Activity Form (CPAF) as a coding system (O’Hara et al., 1989). The CPAF uses four categories of physical activity and provides a numeric value for an observational period based on one minute intervals. These one minute interval scores were then correlated to one minute vector magnitude values from the RT3 units worn during testing.

Semi-structured interview. Prior to this study an eight item semi-structured interview was developed to help gain qualitative information from caregivers about their child’s physical activity patterns. The interview included an initial item on income, followed by seven items. These seven items were asked in a post study interview to obtain information on important skills taught in school for independence, important physical education related skills, importance of physical activity in caregiver’s life, caregiver’s physical education experience, important things that affect their child’s decision to engage in physical activity, what effects the caregiver’s decision to engage in physical activity, and any other related information to help explain their child’s physical activity levels.

Data Collection Procedures

Data were collected via two visits for participants and caregivers. Each participant was brought down to the university by the participating parent where signed informed consent was obtained. The purpose of the study and the nature of the activity monitors were explained to participants, which was followed by fitness testing using the BPFT. Participants were asked to wear two activity monitors, one for the seven day period beginning with this initial meeting and one during the fitness testing (approximately 30 minutes). The fitness testing RT3 was used to gain an estimate of validity for the RT3 units during the movements associated with the fitness testing. A 30 minute video was made of participants engaged in physical activity to compare to observational coding using the CPAF.
Following fitness testing, participants were sent home to wear the RT3 monitors over the following seven-day period. Schools were contacted to insure that participants were allowed to wear the RT3 units at school. Parents were then called midweek to schedule a convenient time to pick up the RT3 units and check if participants were wearing units during waking hours. RT3 units were then picked up and parents were interviewed using the semi-structured format described earlier.

The variable of bouts of moderate physical activity were calculated by determining the amount of energy that an individual expends over and above resting metabolic rate (METs) using RT3 values. The RT3 provides energy values that can then be used to determine the MET values for each minute. Consistent with Kalakanis et al. (2001) MET values greater than 4.5 were used to define bouts of moderate physical activity for participants and caregivers in the study.

Results

This section is organized outlining physical activity and criterion-related fitness estimates for each participant. Motivational scale scores and a display of age X total minutes accrued over a seven day period are then presented. Finally, results from a seven item semi-structured interview for the sample will be presented.

Physical Activity and Fitness Scores

Figure 1 shows physical activity bouts during specific time intervals of the day. These intervals were selected based on arbitrary times believed to conservatively coincide with sleep, school, and free time of participants.

Participant 001. This participant accrued a mean of 14 bouts of moderate physical activity per day. Each bout lasted on average 2 min and 35 sec. Figure 1 demonstrates activity bouts of moderate physical activity and the time of day accrued. It should be noted that the highest values occurred during the weekdays with total absence of moderate physical activity occurring during Saturday prior to noon and Sunday prior to 9 am for this participant. Daily bouts of moderate physical activity from Saturday to Friday were 5, 16, 9, 13, 12, 16, and 28 bouts on respective days of the week. Parent physical activity levels for this participant’s caregiver included 4 bouts per day lasting on average 3 min and 20 sec.
Physical fitness levels for this participant included a body mass index of 21 based on skinfold thicknesses as outlined in the BPFT. Participant 001 scored at the acceptable criterion level of fitness for body composition based on levels set by Winnick and Short (1999). Pacer score (laps = 2) were below the acceptable criterion level for this individual using the protocol outlined in Winnick and Short. An estimate of musculoskeletal functioning was also collected on this participant indicating a score of zero on the curl-up test. This score was not at a level that indicates criterion level fitness for this participant (Winnick & Short).

Participant 002. This participant recorded 6.7 bouts of moderate to vigorous physical activity per day starting on Saturday and ending on Friday (3, 7, 15, 6, 8, 5, and 3 bouts respectively). Bouts lasted on average 132 sec each for participant 002. Parent physical activity levels included an average of 5.28 bouts per day lasting on average 2 min each. A complete absence of moderate physical activity occurred prior to 3 pm on Saturday, prior to noon on Wednesday, prior to noon on Saturday, and prior to 9 am on Thursday.

Physical fitness levels for this participant included a body mass index of 21 and a combined tricep and calf skinfold of 14 mm, both of which indicate acceptable criterion levels of body composition (Winnick & Short, 1999). This participant completed 23 modified curl-ups indicating a failure to reach the criterion levels found in the BPFT. The PACER score for this participant was 28 laps indicating deficits in the area of aerobic functioning (Winnick & Short).

Participant 003. This participant recorded a mean of 16.4 bouts per day lasting on average 3 min and 22 sec. This participant had no bouts of moderate physical activity occurring during Wednesday prior to noon, and Thursday through Sunday, prior to 9 am. Bouts of moderate physical activity accrued Saturday through Sunday were 19, 9, 14, 14, 3, 12, and 26 bouts respectively. Caregiver values for physical activity included 5.14 bouts per day lasting on average 1 min 11 sec.

Criterion-related fitness scores for this participant included a body mass index of 17 and a combined tricep and calf skinfold of 16 both indicating acceptable levels of body composition. Aerobic function as measured by the 16 meter pacer test indicated a score of 25 laps and a value below what Winnick and Short (1999) identify as a criterion level indicating adequate aerobic functioning. A modified curl-up score of 70 was recorded for this student indicating a level exceeding the preferred standard.

Participant 004. Eleven bouts per day were recorded during the one week interval of wearing the RT3 units for participant 004. Each bout lasted about 129 sec. This participant did not accrue any bouts of moderate physical activity on Sunday and no bouts of moderate physical activity before 3 pm on Saturday. Further, prior to 9 am on Monday and prior to 3 pm on Thursday no bouts of moderate physical activity occurred. No parent physical activity values were obtained for this participant due to repeated malfunctioning of the RT3 unit. On two occasions this parent experienced problems with battery voltage resulting in lost data.

Physical fitness scores for this participant demonstrated criterion level fitness in both measures of body composition (Body mass index = 21; sum tricep and skinfold = 38 mm). PACER (16 meter) testing resulted in 18 laps, which were above the specific standard for female individuals with MR (Winnick & Short, 1999). A curl-up score of 26 was also at the specific level for individuals with MR indicating adequate levels of criterion related fitness.

Participant 005. The highest bouts per day of any participants were recorded for participant 005 (18 bouts per day). These bouts lasted on average 3 min and 36 sec per day. This participant also had the largest blocks of time where moderate physical activity failed to occur. Specifically, no bouts of moderate activity were recorded prior to 3 pm on Monday, from 9 am to noon on Tuesday, prior to 9 am on Wednesday, prior to noon on Saturday, and prior to 3 pm on Sunday. Daily bouts of moderate physical activity from Monday to Sunday included 12, 29, 19, 16, 18, 19, and 12 bouts respectively. Caregiver bouts include 14 over the seven day period lasting on average 1 min and 25 sec per bout.

Physical fitness scores for participant 005 include body composition values from a body mass index (BMI = 16) and summed tricep and calf skinfolds (Total Skinfold = 22). These values are both within the acceptable
range based on Winnick and Short (1999). No other fitness data were collected on this participant due to an inability to schedule a testing session around parent and child activities.

**Participant 006.** This participant recorded 11.71 bouts of moderate physical activity per day with a mean bout lasting 2 min and 28 sec. Prior to noon on Saturday, prior to 9 am on Sunday, between 9 am and noon on Monday, and prior to 9 am on Tuesday no bouts of moderate physical activity occurred for this participant. Further, 11, 15, 10, 8, 12, 18 and 8 bouts of moderate physical activity occurred on respective days Saturday to Friday. Parents of this participant engaged in 6 bouts per day, with a mean value of 8 min and 50 sec per bout.

Physical fitness scores from the body mass index (BMI = 58) and the PACER (laps = 10) tests were below the criterion level established by Winnick and Short (1999) for this participant. Although within the minimal standards, the tricep and calf summed skinfold value of 44 was at the upper range for participant 006. The 38 completed modified curl-ups by this participant were also above the criterion level set by Winnick and Short.

**Participant 007.** Participant 007 recorded 13.71 bouts of moderate to vigorous physical activity per day over the seven days measured with bouts lasting 4 min on average over this period. This participant accrued 12, 15, 14, 16, 17, 13, and 9 bouts of moderate physical activity on respective days Saturday through Friday. This participant did not record moderate bouts of physical activity prior to noon on Saturday and prior to 9 am on Sunday. Parents recorded 6.71 bouts per day, with a mean duration of 6 min and 28 sec per bout.

Fitness scores for participant 007 included a body mass index of 16, and based on Winnick and Short (1999), within the parameters of criterion related fitness. Further, this individual completed 16 laps during the PACER test, total skinfold of 12 (subscapular and tricep), and completed 25 curl ups. In all three items, this participant was outside the minimal or preferred standards for health related fitness for individuals with MR (Winnick & Short).

**Motivational Profile**

Figure 2 provides motivational scores for each participant. In these values, the seven cases studied all had lower amotivation scores than...
for any other subscale. Further, levels of intrinsic motivation were higher in all cases with the exception of participant 003 and 007.

**Age Related Physical Activity Patterns**

Figure 3 presents a scatter plot of time engaged in moderate physical activity by age of each participant. An inverse relationship between activity and age is demonstrated.

**Parent Responses to Semi-Structured Interview**

Following an initial item related to family income, seven items were presented to a parent of each of participant. These interviews resulted in many common responses, which are organized in themes below under the respective heading depicting the main topic of the item.

- **Important skills taught in schools for independence.** Independent living skills were cited by all but one participant with respect to important skills taught during formal education. In this, parents were concerned about their child learning in social arenas. For example, participant 001’s caregiver felt that one strong area of learning resulted from lessons that focused on using the phone and contacting classmates to set up activities: “...to develop a social structure... phoning each other... setting up activities to do...” She felt this learning was very important and resulted in meaningful skills. “Independence... able to access leisure time skills” was cited by participant 004’s caregiver.

- **Most important skill taught in physical education classes.** Relative to physical education instruction, parents agreed on lifetime fitness activities. This is highlighted in a passage from
participant 007’s caregiver: “Fitness and health are important more so than short term immediate activities.” Competitive themes are downplayed in a quote from participant 002’s caregiver: “Tailor made activities that deal with what your disability is . . . not something that is not too horrendously competitive . . .” This idea of lifetime and functional activities is also echoed by participant 006’s parent: “. . . not necessarily have them play lots of games and stuff, but to teach them basic exercises, even just going for walks . . .”

How important is physical activity in caregiver’s life? All parents in the limited sample indicted that their schedules did not permit enough physical activity. Although physical activity was perceived as important, like many adults these caregivers lead busy lives that limited the time to devote to daily exercise. Parents made no mention of specific restrictions or lack of time based on having a child with a disability.

Caregivers’ experiences in physical education class. Participant 001’s response to past physical education experiences is indicative of the sample: “They just had it and whatever it was, you were expected to do, whether you were capable of doing it or not.” Also, the emphasis on past competitive experiences in physical education was noted in the response by participant 004: “. . . it [physical education] was strictly given for competition.” In general, the remaining participant caregivers indicated low skill or competence in physical education related activities during their school age years.

Things effecting child’s decision to engage in physical activity. In response to this item the theme related to the social aspects of physical activity emerged in most of the parent responses. This is highlighted in participant caregiver 006’s indication of the use of social pressure to participate: “It’s all social. The people that she’s with; she wants to please them.” This was coupled with the issue of personal enjoyment in participant 007’s parent’s response: “First, does he like doing it and second does he have a friend who is also doing it.” Finally, more logistical barriers to physical activity were noted by the caregiver from participant 002: “. . . transportation, he cannot drive so you have to rely on public transportation . . . that is the number one thing, being able to get somewhere.”

Discussion and Recommendations

These data represent extensive information on a limited sample. For this reason results need to be interpreted with caution and be viewed as indicators of where more study is needed. However, with what is currently known about adolescents with disabilities, some inferences can be drawn from this small sample. Further, recommendations are provided based on these findings to help program developers’ work with families to increase activity in older adolescents with MR.

These data show that some individuals with disabilities are on par with other peers without disabilities. Even though Kalakanis et al. (2001) focused on obese children, their findings were not inconsistent with the amount and duration of physical activity for nonobese children. However, these data show a trend of short bouts of moderate physical activity that may be inadequate from a health-related standpoint given the low fitness scores in most of the sample. Although these individuals are
accruing adequate numbers of moderate physical activity on many of the days studied, these activity bouts given the brief nature may be inadequate to impact on cardio respiratory endurance. The similarities for these participants and those studied indicate similar amounts of physical activity which may be indicative of what many feel is a pattern of inactivity that is affecting our population as a whole (US Department of Health and Human Services, 1996). In summary these participants may be as inactive as many of their peers without disabilities and thus the low fitness scores are an area in need of further study with respect to activity patterns.

Interesting to note in the time frames for physical activity for the participants are high number of bouts of physical activity during the afternoon hours. This is consistent with the time for community and leisure physical activity involvement. These participants are ranging between six and 12 bouts of moderate physical activity per day after 3 pm. Further calculation of minutes indicate that for participant 005 an average of 46 min were devoted to moderate physical activity during the afternoon, however, participant 004 only accrued 6 min per day of moderate physical activity. This variability coupled with the high amount of inactivity found in all participants prior to 3 pm in the day is perhaps related to adequacy of physical education programming and in need of further study.

The inverse relationship between age and physical activity is consistent with findings by Sallis, Prochaska, and Taylor (2000) in their review of correlates to physical activity that as age increases activity levels decrease. For individuals with MR this is perhaps explained by the lack of social networks and transportation based on the parent interviews. These barriers are outlined in Modell and Valdez (2002) who target transportation, dress/equipment, payment, and many other logistic aspects of physical activity participation as key instructional areas to prepare children for life in adult society.

Motivation profiles support that these are individuals who are both intrinsically and extrinsically motivated. This would lend support to the caregiver responses highlighting social rationales for participation. Amotivation may not be the issue as much as apathy or a lack of self-determination in that age related trends seems to be better predictors of inactivity than the motivational profile. Frustration with a lack of social networks and isolation may be more the causal factor to inactivity than a poor motivational profile. Further, many believe that individuals with MR are in need of training with respect to self-determination, which would lesson extrinsic motivation and enhance intrinsic motivation (Wehmeyer, 1994).

Of interest in the current data are parent responses that highlight the importance of social variables with respect to adolescent physical activity patterns. As is the case for persons without disabilities, a social group is an important factor with respect to caregiver perceptions of determinants for physical activity. It should also be noted that a lack of relationship between parent and child physical activity patterns was found in these data. In many cases, caregivers noted a lack of time to engage in physical activity and their RT3 values supported this inactivity. These responses are supported by the relatively low number of bouts of moderate physical activity per day and the brief intervals recorded for some participants. A recommendation is for families to create opportunities to engage in physical activity together. Physical educators may be able to impact on this with proper attention to family needs (Kozub, 2001).

Recommendations for programmers and future researchers include determining if choices as outlined in Modell and Valdez (2002) affect physical activity levels in individuals with MR after school and post schooling into the adult years. Effects of transition services and offering learners with MR a wider range of lifetime and community-based options may impact positively on physical activity patterns if parent concerns noted in the present study are addressed. As outlined by Modell and Valdez, critical functional issues are perhaps related to successful community engagement. These factors include transportation to the facilities as well as training in basic use of locker rooms, payment for services, and equipment use.

As indicated in the qualitative responses to the semi-structured interview, social networking is important for physical activity and the other aspects of these adolescent’s lives. Pavri (2001) document the loneliness and isolation
believed to exist for children with disabilities. Pavri also outlined some strategies that may help program providers of adolescent and adult age individuals with disabilities cultivate social networks. Physical activity is a perhaps one of the best avenues to utilize the strategies outlined in Pavri which include: teaching social skills, creating opportunities for interaction, creating an accepting classroom (though cooperative games), teaching coping strategies, and enhancing self-esteem. Arguably age appropriate physical activity may be one avenue to accomplish all of these intervention approaches. Encouraging phone contacts to set up meetings for walks and other functional physical activity options are important strategies and may particularly help individuals with MR who live at home and may have limited access to peers with and without disabilities.

One final suggestion for program providers is to consider recommendations of Kozub (2001) in understanding how parent leisure skills can be a barrier to participation of the child. This could be a parent who lacks the motor skill or fitness levels to engage in a physical activity who may actually impede the child’s ability to participate. In these data some indication of a lack of appropriate physical education programming is supported in parent responses to their physical education experiences. Specifically, these caregivers indicate less than adequate prior physical education programming designed to address lifetime leisure skills. More study is needed on a larger sample of participants to determine the nature of this caregiver and child physical activity relationship.

Summary

The RT3 units were suitable for individuals and caregivers studied. These data demonstrate that individuals with MR may be as much at risk for inactivity the same as peers without disabilities. Further, factors explaining inactivity in caregivers and how this impacts on other members of the family with respect to family systems theory is in need of study in special populations. If what affects one member of the family affects the entire unit (Turnbull & Turnbull, 1990) then adapted physical educators and recreation therapists need to explore how to facilitate increased family physical activity. More study is needed utilizing RT3 technology as well as studies aimed at determining barriers to physical activity for persons with MR.

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Received: 21 August 2002
Initial Acceptance: 5 October 2002
Final Acceptance: 25 October 2002