Effects of a Skiing Experience on Adolescents With Limb Deficiencies: An Occupational Adaptation Perspective

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Key Words: competence • self concept • sports

Objective. Effects of a 6-day snow skiing trip on 14 adolescents with limb deficiencies were explored. The purpose was to determine whether components of mastery and self-esteem could be identified.

Method. Participant observation data collection methods included videotape, interviews, daily progress notes by ski instructors, and a 1-month posttrip questionnaire. Data were analyzed for evidence of efficiency, effectiveness, and satisfaction to self and others (properties of relative mastery described in occupational adaptation.) Skier reports of positive effects were analyzed for indications of an impact on self-esteem. Three occupational therapists who have extensive experience working with adolescents also reviewed videotapes and written information.

Results. The therapists acknowledged the presence of skill mastery as an important component of skiers' positive self-evaluation. They also commented that evidence of preexisting self-esteem and social aspects of the trip were as likely to produce positive effects as mastery of skiing.

Conclusion. Research method considerations (use of participant observation for hypothesis testing) preclude definitive interpretation of a link between skill mastery and self-esteem. Short-term positive effects of the skiing experience reported by questionnaire were present 1 month after the trip. Long-term effects should be studied.

Participation in sports is generally believed to lead to an increased sense of competence for persons with as well as without disabilities (Rehberg & Schaefer, 1968). However, the effects of achieving competence in sports and their relationship to the development of self-esteem have not been well documented. Nevertheless, Hopper and Santomier (1984-1985) argued that sports create situations for the development of positive self-esteem if the outcome of the performance is perceived by the participant to improve self-worth.

If sports have a beneficial effect on self-esteem, they could be of particular benefit to adolescents. Adolescence is a critical time for the development of self-esteem. The physical self is the central concern of the teenager (Miller, 1987), and aspects of one's physical image are known to influence self-esteem. Often the adolescent's self-image and self-esteem depend on the views of significant others and on how the adolescent views interactions with others (Miller, 1987).

Of particular relevance to the study reported here is a lack of research in the effects of sports on the development of self-esteem in adolescents with limb deficiencies, whether congenital or acquired. According to Varni, Rubenfeld, Talbot, and Setoguchi (1989), children with limb deficiencies base their sense of self-esteem largely on their social interactions with their parents, teachers,
peers, and their comparative competency in areas important to them such as school, athletics, and physical appearance. The sense of competence that comes from physical activities may be particularly relevant to adolescents affected by limb loss. During her 5 years of experience as a ski instructor for persons with disabilities, the first author had observed the positive outcomes of skiing for adolescents with limb deficiencies and wished to study the topic further. The purpose of the study described here was in part to confirm her earlier observations by documenting skill development in a group of adolescent skiers with limb deficiencies and to ask (a) whether an experience of relative mastery as described in the occupational adaptation frame of reference (Schkade & Schultz, 1992, Schultz & Schkade, 1992) could be identified in this group, (b) whether indications of positive impact on self-esteem could be identified, and (c) whether there appeared to be a relationship between the experience of relative mastery and enhancement of self-esteem.

Occupational therapy frames of reference have long emphasized skill mastery as important to the development of competence in occupational functioning. For example, Mazer (1968) viewed mastery as contributing to ego consolidation. Mosey (1973) considered mastery in terms of the person’s ability to select appropriate choices in the service of meeting one’s own needs and abilities. Llorens (1976) included mastery within a developmental model, in which skill mastery of developmental tasks and interpersonal interactions contributes to adaptive capability. Kiethofner and Burke (1985) used the term mastery to describe an urge to gain control over self and environment and to “connote fitness and responsiveness to external demands and to personal desires for competence” (p. 14). Schkade and Schultz (1992) described mastery as relative and idiosyncratic to the person’s experience. They defined relative mastery as the extent to which the person experiences three properties in responding to occupational situations: efficiency (use of time and energy), effectiveness (achievement of goal), and satisfaction to self and others (elicitation of positive feelings by both the person and relevant society). Thus, each of these five perspectives generally related mastery to competence, but the specific characterizations differ. The occupational adaptation description of relative mastery with the properties of efficiency, effectiveness, and satisfaction to self and others allows for operationalizing mastery as a construct more readily than the other perspectives. It is that description that is the focus of this article.

Occupational adaptation (Schkade & Schultz, 1992, 1993; Schultz & Schkade, 1992) is a theoretical frame of reference whose fundamental premise is that humans are occupational beings who are faced, throughout their life span, with the need to respond to occupational challenges to promote health and well-being. Occupational adaptation attempts to describe the process through which occupational functioning develops. It postulates that occupation takes place within a context that is configured by physical, social, and cultural subsystems. Occupational adaptation also proposes that sensorimotor, cognitive, and psychosocial systems are inevitably present in every activity. Optimal relative mastery depends on the orchestration of these three systems balanced appropriately for a given activity in light of the physical, social, and cultural demands. Relative mastery, as a construct, describes the mechanism through which persons evaluate their occupational responses. This evaluation process leads to learning, adaptation, and enhancement of occupational functioning. Because skiing is an activity that requires the involvement of all person systems and that takes place within a context with physical, social, and cultural influences, occupational adaptation appears to be an appropriate framework within which to explore the impact of this activity on adolescents with limb deficiencies.

Properties of Relative Mastery

**Efficiency**

Efficiency concerns the use of time and energy to carry out the skiing activity. Behavior consistent with high levels of energy use includes intense concentration as seen in a tense, rigid posture with the head positioned down to watch the skis. Movement is slow and robotic. Thought is required for every movement. Novice skiers tend to exhibit these behaviors. Improvements in efficiency are seen when the skier exhibits less rigid posture, more rhythmical coordinated and automatic movement, and increases in speed. This description is consistent with the literature on motor learning (Magill, 1989). Greater independence (i.e., the ability to stand up independently after falling, the ability to get on or off a chair lift without assistance, etc.) reflects increased efficiency. Less physical assistance from the instructor and more advanced cues for skiing technique are other indicators. The skier becomes less dependent on training tools, such as the bungee cord attached to the front of skis to help maintain a wedge position. The skier may even eliminate use of such training tools. Outriggers are not considered a training tool because they are needed for three- and four-track skiers; however, they should be used to facilitate turns and not completely relied on for support and maintenance of upright balance. Their use may vary from skier to skier, depending on pattern and level of amputation.

**Effectiveness**

Effectiveness concerns competence in skill and skill development. Development of skill components is seen in the following progression:

1. ability to walk in skis
2. ability to complete a circle while walking with skis on a flat surface
3. ability to complete a gliding wedge, then complete a turn
4. ability to complete a series of turns
5. ability to progress to a straight run and wedge stop
6. ability to complete wide parallel turns
7. ability to complete parallel turns.

Effectiveness may be evidenced by an advance in equipment (such as a progression from shorter to longer skis), an increase in the level of slope difficulty (ski resort convention calls for slopes to be graded in difficulty: green = beginner; blue = intermediate; blue-black = advanced intermediate; and black = advanced), and an increase in the progression of skill component development.

Satisfaction to Self and Others

Satisfaction to self and others concerns the sense of pleasure to self and to relevant society that an activity provides. Evidence of this includes comments that reflect self-appraisal of skill level, improvements made, and general comments regarding performance. Bodily gestures, smiles, verbal comments, and written responses that indicate self-evaluation (approval or disapproval) of the experience likewise relate to satisfaction to self. Any comments made referring to family approval, friends, instructors, and so forth identify satisfaction to others.

Method

Study Design

Participant observation (Krefting, 1989) was chosen as the method for this study. With the participant observation method, the researcher not only observes but participates in the activities of the persons studied and records events, comments, and interactions. Other methods of a more quantitative nature were considered, but we concluded that those methods were not rich enough in context to capture a phenomenological experience. Because occupational adaptation posits relative mastery as an experience relative to the person, a phenomenological approach was chosen.

The naturalistic setting in which the study was conducted clearly seemed to indicate qualitative methods as opposed to quantitative ones. We thus opted for what we believed to be a richer approach for describing the experience of this group of adolescents. Readers knowledgeable in qualitative research methods will note that this study departs from the traditional constraints of qualitative methods in both data collection and analysis because a theoretical assumption was posited a priori.

According to Strauss and Corbin (1994), the limits of qualitative methodology are being challenged because qualitative methods have become used by disciplines including education, social work, nursing, and psychology. Other recent authors have talked about qualitative methods in activity testing (DePoy & Gitlin, 1994) and hypothesis testing (Patton, 1990). Nonetheless, there will be some readers who will take exception to what they think of as the impurity of the method used in this study. We encourage an exploration of sources such as Schkade (1995) that summarize some of the current thinking about the use of qualitative methods.

The researcher (the first author) served as a participant observer during a 6-day ski trip at the National Sports Center for the Disabled (NSCD) in Winter Park, Colorado. She traveled with the subjects, skied with them, shared the same quarters, participated in meal preparation responsibilities, and took part in social activities.

Subjects

The subjects consisted of seven male and seven female adolescents who had a variety of limb deficiency patterns of differing etiologies and who had been or were receiving treatment at Texas Scottish Rite Hospital for Children (TSRHC). The 6-day ski trip was the 10th in a series of annual trips sponsored by TSRHC for this population. The researcher had no part in selecting the subjects; the subjects were selected by the staff members of TSRHC on the basis of their criteria. (Demographic information on the subjects is shown in Table 1.) Criteria included age

Table 1 Participant Demographics

<table>
<thead>
<tr>
<th>Subject</th>
<th>Age/Gender</th>
<th>Amputation Type/Level</th>
<th>Congenital/Acquired</th>
<th>Number of Ski Trips</th>
<th>Prosthesis Worn During Skiing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>14/F</td>
<td>Unilateral BKA</td>
<td>Acquired</td>
<td>Two</td>
<td>Yes</td>
</tr>
<tr>
<td>2</td>
<td>16/F</td>
<td>R/Ametia; I Phocomelia</td>
<td>Congenital</td>
<td>Two</td>
<td>No</td>
</tr>
<tr>
<td>3</td>
<td>17/F</td>
<td>Unilateral BKA</td>
<td>Congenital</td>
<td>One</td>
<td>Yes</td>
</tr>
<tr>
<td>4</td>
<td>13/F</td>
<td>Unilateral Hemimelia</td>
<td>Congenital</td>
<td>One</td>
<td>No</td>
</tr>
<tr>
<td>5</td>
<td>15/M</td>
<td>Unilateral BKA; partial digits hand</td>
<td>Congenital/Acquired</td>
<td>One</td>
<td>Yes</td>
</tr>
<tr>
<td>6</td>
<td>15/M</td>
<td>Bilateral BKA;</td>
<td>Congenital</td>
<td>One</td>
<td>Yes/No</td>
</tr>
<tr>
<td>7</td>
<td>15/M</td>
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<td>Acquired</td>
<td>Two</td>
<td>Yes</td>
</tr>
<tr>
<td>8</td>
<td>14/M</td>
<td>Bilateral Acheiria, BE</td>
<td>Congenital</td>
<td>One</td>
<td>Yes</td>
</tr>
<tr>
<td>9</td>
<td>15/F</td>
<td>Unilateral AKA</td>
<td>Congenital</td>
<td>Four</td>
<td>Yes</td>
</tr>
<tr>
<td>10</td>
<td>16/F</td>
<td>Unilateral AKA</td>
<td>Congenital</td>
<td>Four</td>
<td>Yes</td>
</tr>
<tr>
<td>11</td>
<td>16/F</td>
<td>Unilateral AKA</td>
<td>Congenital</td>
<td>Three</td>
<td>Yes</td>
</tr>
<tr>
<td>12</td>
<td>15/M</td>
<td>Unilateral BKA</td>
<td>Congenital</td>
<td>Three</td>
<td>Yes</td>
</tr>
<tr>
<td>13</td>
<td>16/M</td>
<td>Unilateral BKA</td>
<td>Acquired</td>
<td>Three</td>
<td>Yes</td>
</tr>
<tr>
<td>14</td>
<td>17/M</td>
<td>Unilateral BKA</td>
<td>Congenital</td>
<td>Five</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Note: BKA = below knee amputation, AKA = above knee amputation, BE = below elbow amputation, amelia = congenital absence of limb, phocomelia = congenital shortness/absence proximal portion of extremity, hemimelia = congenital malformation of distal extremity portion such as fibula, acheiria = congenital absence of one or more hands.

*Change of equipment. Due to design of mono ski, prostheses were not indicated.
(between 13 and 19 years) and substantial limb loss. (For example, an adolescent whose limb deficiency is a single finger loss would not be considered.) Preference was given to persons with a lower-extremity limb loss, but some adolescents with upper-extremity deficiencies were included (see Table 1). Severe limb loss did not exclude an adolescent from participation. The TSRHC staff members intentionally chose equal numbers of boys and girls. A mixture of novice and experienced skiers was selected. Personal attributes such as socioeconomic circumstances (all expenses were paid by TSRHC and interested donors), satisfactory academic standing, leadership qualities, ability to associate with others, and positive outlook on life were additional criteria.

At the time of this study, the researcher was an occupational therapy student in a professional master's degree program. She is certified as a therapeutic recreation specialist and is a ski instructor for persons with disabilities. In addition to the researcher, subjects were accompanied by TSRHC staff members: the chief of staff (an orthopedist), the director of prosthetics, a nurse, an occupational therapist, the director of child life, the director of media services, and a volunteer from the hospital auxiliary, all of whom participated in the skiing activities.

Procedure for Collecting Data

Two weeks before the ski trip, subjects met at TSRHC to select ski clothing. The researcher met with the subjects and their parents to describe the study and secure their participation. One subject did not attend and was contacted by mail and a follow-up telephone call. All 14 subjects agreed to participate in the study.

Data collection involved multiple methods to allow for triangulation of data (Krefting, 1991). One method was to videotape subjects skiing on the slopes. In addition, videotaped interviews took place in such settings as the ski slopes and ski lifts to obtain personal insights, viewpoints, and attitudes of the subjects. A second method involved recording daily notes that reflected behavior observed, verbal responses expressed, and interpretation of these data by the researcher in terms of thoughts, feelings, ideas, and hypotheses. A third method involved using the daily progress notes that the NSCD ski instructor wrote for each subject. The instructors documented specific equipment used, identified the slopes skied (including the difficulty of the terrain), listed teaching methods used by the instructor, noted problem areas, and noted the progress made each day. No attempt was made to influence their documentation. The instructors were, however, requested to ask the subjects to complete a questionnaire with three brief items at the end of each skiing day:

1. On a scale of 1 to 10 (10 being the best), how do you think you did on the slopes today?
2. How do you think you did compared with yesterday?
3. On a scale of 1 to 10, how do you feel about yourself?

This questionnaire was intended to provide an additional source of information reflecting the skiers' experience of relative mastery and its possible link to self-esteem.

A fourth method involved mailing an open-ended questionnaire to each subject 1 month after the trip to assess the effect of the trip and to determine whether there was a generalization of those effects in other areas of routine activity. The questionnaire consisted of eight questions:

1. Thinking over your trip, are you glad you went? Why or why not?
2. What is the biggest difference the trip has made in your life?
4. If you had it to do all over again, what would you do differently?
5. Would you do it again? Why or why not?
6. If you were counseling a friend who lost a limb, would you recommend this trip to him or her? Why or why not?
7. What do your friends and family members think of your trip?
8. Do you have any additional comments concerning your experience?

Treatment of Data

The data collection methods resulted in a substantial amount of written information and videotaped observations and interviews. This information was reduced and coded according to the operational definitions of relative mastery described earlier.

Videos. Approximately 12 hr of videotape recording various aspects of the trip were reduced to 1.5 hr. Some reductions involved eliminating duplication of skiing sequences by the two videocamera operators. Other reductions involved cutting lengthy segments that were repetitious without providing new information. When duplicative segments were equivalent in information, the better quality footage was selected.

Individual skier sequences were placed chronologically on the condensed videotape. In other words, footage of skier number 1 (numbers were arbitrarily assigned to skiers) was arranged from the first day of skiing to the last day. Available, a videotaped interview with that skier began the sequence. The choice of sequences was based on the following criteria: (a) those that best depicted the week's progression of each skier's experience and (b) those directly related to learning to ski. The final videotape allowed the researcher to see the progress of each
skier over the number of days on which he or she skied.

The amount of footage for each subject varied for numerous reasons. First, only two videocameras (one operated by the TSRHC director of media services and one by the researcher) were available to film 14 subjects. Second, all skiers did not ski on each of the 5 skiing days for various reasons. For example, one was ill, one developed a blister on a weight-bearing stump, and one sustained a slight concussion from a fall on the slopes. On the last day, some subjects decided to shop rather than ski. Third, more advanced skiers were often more difficult to film. For example, this was the fifth TSRHC ski trip for the oldest (17 years of age) and most experienced subject. Because of his demonstrated competence and seniority, he was allowed to ski without an instructor per his request. His advanced skill level allowed him to select terrain that made him difficult to locate; therefore, no film was obtained of him. On the other hand, novice skiers were readily accessible, and this resulted in extensive videotape footage of those subjects.

Narratives that described each subject’s skiing sequences were developed by the researcher to assist anyone reviewing the videotapes. Identification of relative mastery components (efficiency, effectiveness, and satisfaction to self and others) were identified in each narrative according to the operational definitions.

Written information. Instructor progress notes were used to identify possible advancement of skill level by indicating the progression or regression of slopes skied by each subject and to note problem areas. The three-item daily questionnaires became part of the written information. There was considerable inconsistency in completion of these daily questionnaires. Thirteen subjects completed at least two of the four requested. Another written record, participant observation notes, identified observed behavior and verbal responses made outside the area of the ski slopes and included data not described on progress notes, the daily questionnaires, or the videotape. The purpose of including such data was to gain insight into the experience from the perspective of the subject’s daily routine. Thirteen subjects responded to the posttrip questionnaire (see Table 2).

All the written information was converted to narrative form with quotations from the progress notes, questionnaires, and participant observation notes. As with the videotaped narration, efficiency, effectiveness, and satisfaction to self and others were identified according to the operational definitions.

Outside reviews of the data. Three occupational therapists who had extensive experience working with adolescents in a psychosocial setting were asked to serve as reviewers of the videotapes, the narratives, the posttrip questionnaires, and the definitions of efficiency, effectiveness, and satisfaction to self and others. They were asked to comment on the following items:

1. Was there evidence to indicate that the skiers experienced enhanced self-esteem as a result of the skiing activity?
2. If so, did the increase in self-esteem appear to be the result of some experience of mastery of the skiing activity?
3. If mastery was observed, did it appear to be related to improvements in efficiency, effectiveness, and satisfaction to self and others?

Further comments from the reviewers were requested.

Analysis and Interpretation of Data

Individual case descriptions of each subject were generated on the basis of all the data sources previously described. These cases appear in the original report of this

<table>
<thead>
<tr>
<th>Table 2 Posttrip Questionnaire Responses</th>
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<tbody>
<tr>
<td>Item</td>
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<tr>
<td>----------------------------------------</td>
</tr>
<tr>
<td>Did you enjoy trip and would you return again?</td>
</tr>
<tr>
<td>Beginners</td>
</tr>
<tr>
<td>Repeaters</td>
</tr>
<tr>
<td>Exposure to other amputees a positive experience?</td>
</tr>
<tr>
<td>Beginners</td>
</tr>
<tr>
<td>Repeaters</td>
</tr>
<tr>
<td>Did you accomplish what you expected?</td>
</tr>
<tr>
<td>Beginners</td>
</tr>
<tr>
<td>Repeaters</td>
</tr>
<tr>
<td>If you had it all over again, what would you change?</td>
</tr>
<tr>
<td>Beginners</td>
</tr>
<tr>
<td>Repeaters</td>
</tr>
<tr>
<td>What do friends and family think?</td>
</tr>
<tr>
<td>Beginners</td>
</tr>
<tr>
<td>Repeaters</td>
</tr>
<tr>
<td>Would you recommend skiing to a fellow amputee?</td>
</tr>
<tr>
<td>Beginners</td>
</tr>
<tr>
<td>Repeaters</td>
</tr>
<tr>
<td></td>
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</tbody>
</table>

Note. Beginners n = 5, repeaters n = 8

*Volunteered, not elicited by direct question.
study (Berg, 1992). Space limitations preclude complete descriptions in this article.

Because no videotape was obtained on 1 subject, the analysis was conducted on the remaining 13 subjects. As expected, there was considerable variability in the experience of the subjects. One believed her first day to be a disaster and telephoned her parents. She reported that she “hated” skiing and asked to go home. By day four, she reported that she “loved” skiing. Another subject demanded that the videocamera not be used on day one. Toward the end of the week, she made sure that she was filmed. One subject with bilateral lower-extremity amputations made slow progress initially in ski equipment that placed him in a standing position. When switched to a mono ski (an apparatus mounted on a single ski that allowed him to use a sitting position), he progressed rapidly. Early instructor progress notes for one subject recorded “fell frequently, easily frustrated.” Later in the week, documentation on this same skier read “is more relaxed, but has difficulty completing even turns.” For another skier, the initial documentation read “tends to get nervous and falls down, loses her balance.” Later documentation on this skier read “turns have improved greatly—clean, smooth, linking turns.”

All 13 skiers showed gains in efficiency as the week progressed. Even the skier who could only ski 1 day because of illness showed progress from the morning to the afternoon runs. All 13 subjects demonstrated increases in effectiveness as evidenced by improved skill level, upgrades in equipment, and increasing difficulty of slopes skied. All subjects indicated satisfaction to self, and 12 subjects indicated satisfaction to others (family members and friends). Despite individual variations (which were expected), these data support the belief that the skiing trip had a positive effect on the subjects. Videotapes, verbal comments, and written expression all provide consistent evidence for this conclusion.

Relative Mastery

Development of relative mastery during the trip appears to have been pervasive. The experiences were individual to each skier, but in general, there was substantial evidence for gains in efficiency, effectiveness, and satisfaction to self and others.

Efficiency

The videotapes revealed a progression in the quality of the skiers’ movement, particularly in the novice skiers. The considerable amount of footage of the novices provided a greater opportunity to observe their improvement. Movements characterized by increasingly greater fluidity, coordination, and automaticity were seen among all subjects during the week. All of these characteristics indicate improvement in use of time and energy. The subjects showed improvement in the speed with which they negotiated the slopes, apparently less effort directed to thinking about what they were doing, and increased independence. For the more advanced skiers, the gains in efficiency were not as evident. The more subtle improvements seen in advanced techniques probably produced gains in efficiency, but inferring such gains from the videotapes was problematic, in part because of limited footage and in part because of the possibility of a performance ceiling effect (Magill, 1989).

Effectiveness

Skill improvements were obvious on the videotapes and in the instructor progress notes. The progression of slope difficulty indicated that the subjects were more effective in maneuvering their skis and their bodies. The fact that they were selecting increasingly difficult slopes suggested that they were having successful experiences that they wanted to enhance with more challenging runs. For those who responded to the brief daily questionnaires, the self-reports of how well they performed were additional evidence that they were developing and experiencing increasing competence in the skiing activity.

Satisfaction to Self and Others

The many expressions of self-satisfaction occurred in response to various stimuli. Some were spontaneous and were elicited by the achievement of the moment. Others were derived through interviews and questionnaires. Many were visual, taking the form of broad smiles and gestures of accomplishment. The following examples of responses on the posttrip questionnaire provided substantial evidence of satisfaction to self. Each quotation is from a different skier.

- “I had always been told I could do anything like a normal person if I tried, and the trip further proved it to myself.”
- “I can ski good.”
- “It just made me feel free.”
- “The trip was one of the high points of my year.”
- “I think it was a great advantage for me to be reassured of what I can do.”
- “This year I felt like I had control of my skis, so I was able to go as fast as I wanted without worrying about whether I would be able to stop or not.”
- “I am able to ski like other nonhandicapped people.”

Satisfaction to others was evident. Of the 13 subjects who returned questionnaires, 12 indicated that family members and friends supported the trip and believed it was a positive experience. One skier did not respond to the item regarding friends and family members.
Relative Mastery and Self-Esteem

If one accepts the presence of relative mastery as defined in this article as associated with the skiing experience, then relative mastery as a mechanism whereby self-esteem is enhanced may have some validity. Responses on the posttrip questionnaire provide the most compelling evidence that self-esteem was an outgrowth of improvements in skill acquisition. The following excerpts, each given by a different skier, are indicative of such an interpretation.

- “It’s given me more confidence in myself and in what I can do.”
- “It is a very uplifting experience to really get a person’s self-image up.”
- “I feel that the trip has really helped me to accept myself and has given me the courage to try new things.”
- “It really feels good to try a seemingly difficult sport and be able to excel at it like a normal person.”

Sample responses regarding whether they would recommend the trip to a friend who had lost a limb included the following:

- “Definitely. It can help them see they are able to conquer one more goal.”
- “It think it helps to build up your self-esteem and confidence. To me, it helps the person realize that there is no hill to [sic] high to climb in any part of life.”

There is the possibility that the experience of relative mastery and the apparently positive effects on self-esteem may have been a function of the characteristics of this particular group of adolescents. They may have been persons who already had high levels of self-esteem and thus were predisposed to experience such benefits. One of the outside reviewers made such a comment. Because self-esteem was not measured directly, either before or after the trip, this argument has merit. During the design phases of the study, consideration had been given to using a preobjective and postobjective measure of self-esteem. The research committee at TSRHC concluded that the clinical nature of the measure seemed out of place with the nature of the experience they wanted to provide; therefore, this measure was not included in the study.

It is possible that the beneficial effects of the trip were simply the result of the social interaction. One reviewer pointed out that any self-esteem enhancement appeared to be in part from the confidence that comes from a comfort level of being with the same persons over a period of time as trust and rapport developed.

The three reviewers were in general agreement that there was evidence of enhanced self-esteem and that it could be related, at least in part, to increased mastery of the skiing activity. One reviewer pointed out that there were many instances where increased endurance was noted by the instructors. It was her opinion that endurance should be added to the definition of efficiency. She reported a personal lack of familiarity with specific skiing techniques, but she was able to identify changes in speed, reduced hesitation with transitional movements and turns, and improved posture. She wanted to know whether the skiers went through the preparation phases faster and with fewer prompts as the week progressed.

One reviewer pointed out that the novice skiers seemed to experience a “cloud nine” (euphoric) effect that she thought might not transfer immediately to general life situations. Given this observation, it was not surprising that she saw more of the generalization evidence in the experienced skiers. She commented that the novice skiers tended to be younger, and this age variable could be an important factor in that the younger skiers are likely to have had less experience with generalizing across experiences. This same reviewer made the interesting observation that the adolescents with congenital conditions seemed to view mastery as just another accomplishment, whereas subjects with more recent amputations viewed accomplishment from a challenge or success perspective. She concluded that the interaction with peers and supportive adults was probably as effective in enhancing self-esteem as skill mastery and would probably be the experience most likely to carry over into other situations.

Conclusion

A fundamental assumption guiding the research reported in this article was that an experience of relative mastery in a group skiing activity for adolescents with limb deficiencies would result in higher self-esteem for those skiers. The results of this study suggest that subjects do experience relative mastery and increased self-esteem. The extent to which relative mastery and self-esteem may be linked causally is obviously subject to debate, given the current methodology. However, subjects clearly perceived the ski trip as an activity in which they experienced a sense of mastery over their fears, their limb deficiencies, and the challenging physical environment. Their expressions of increased self-esteem were stated in positive terms as cited earlier. Outside reviewers thought that the increased self-esteem could be attributed to other factors such as the psychosocial aspects of the trip or an existing high level of self-esteem in the subjects themselves.

At a developmental stage where a positive self-evaluation can be critical to development of self-esteem, success opportunities in challenging situations are important. The overall outcomes of the ski trip lend support to the notion that, in their perception, success in a group sporting event did have at least short-term beneficial ef-
fects for this group of adolescents. Additional research should address the long-term effects and the generalizability of those positive effects to various life situations. Levels of self-esteem before and after the trip must be measured to adequately address the question of initial levels of self-esteem. In considering long-term effects on self-esteem, it would be virtually impossible to account for the effects of the skiing experience, given the multiplicity of experiences that affect self-esteem over the long term.

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