The Experience of Choice in Physical Activity Contexts for Adults With Mobility Impairments

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This exploratory study described the experiences of choice in physical activity contexts for adults with mobility impairments. The experiences of 3 female and 2 males with mobility impairments between 18 and 23 years of age were described using the interpretive phenomenological methods of individual interviews, written stories, and field notes. Thematic analysis revealed three themes: (a) interpreting the setting described participants’ interpretation of the environment, person, and task when making movement choices; (b) alternative selection described how participants actively engaged in analyzing alternatives and choosing among them; and (c) implications of choices made described participants’ evaluations of good and bad choices and what was learned. Evidence of effective choice making among adults with physical impairments suggests the potential efficacy of ecological task analysis as a pedagogical tool in physical activity contexts.

Keywords: physical activity, movement skill acquisition, coaching, functional performance, wheelchair sport, qualitative inquiry

Choices are a part of day-to-day life (Harchik, Sherman, Sheldon, & Berman, 1993) and are an essential part of functioning independently (Shevin & Klein, 1984). The importance and processes of making choices within a learning environment are poorly understood, particularly for people with mobility impairments (Wehmeyer, Agran, & Hughes, 1998). Choice may be viewed as the opportunity to make an uncoerced selection from two or more alternatives or options based upon individual preferences (Davis & Strand, 2007). This means a person makes a choice with a full sense of personal endorsement or wanting (Deci & Ryan, 2000). True alternatives are those that are both legitimate and meaningful to the person.

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making the choice (Fullwood, 1990; Taylor, Goodwin, & Groeneveld, 2007). An alternative is considered legitimate when the person possesses the skills necessary to act on that alternative. An alternative is meaningful when it has personal value or interest. Preferences, in turn, are reflective of the characteristics of the available alternatives and can be viewed along a continuum of acceptance and rejection (Davis & Strand, 2007). When alternatives are legitimate and meaningful, motivation and performance may be enhanced as individuals perceive a greater sense of personal control (Wehmeyer et al., 1998).

Opportunities for choice have been removed or restricted for some groups of people including children, people with severe impairments, and older adults (Davis & Strand, 2007; Wehmeyer, 2003). Restriction may occur when an authority figure or someone who is in a position of influence, be it a parent, teacher, physician, or caregiver, believes the person is incapable of making good choices (Prosser 1992) or lacks the experience to make informed choices and thus needs to be protected from the potential consequences of those choices (Fullwood, 1990). As a result, the authority figure may restrict alternatives or make the choice on behalf of the person thereby limiting opportunities for the expression of personal agency or self-determination (Rossow-Kimball & Goodwin, 2009). Individuals who have had limited opportunities to engage in choice making may lack the experience and knowledge necessary to make effective choices among a variety of alternatives (Schloss, Alper, & Jayne, 1993). There are five assumptions surrounding legitimate and meaningful choice making: (a) people are afforded a range of alternatives from which to choose (Fullwood, 1990), (b) they can identify the available alternatives, (c) they have preferences, (d) they know how to express their preferences through choice making (Shevin & Klein, 1984), and (e) they have the power, opportunity, and disposition to act upon their choices (Davis & Strand, 2007).

Providing opportunities to make choices places the person at the center of the learning process by encouraging the most effective and efficient movement form for each person, connecting movement with cognition or knowledge, and encouraging creative problem solving (Balan & Davis, 1993; Pagnano & Griffin, 2001). However, presenting alternatives that are not within a person’s capabilities results in choice becoming irrelevant to the person (Davis & Strand, 2007). For example, asking a person who uses a wheelchair to shoot at a regulation basketball hoop using a traditional shooting pattern when the person lacks the strength to meet the distance is not a legitimate shooting pattern alternative. However, the activity can be individualized by removing socially imposed barriers such as rules by changing the task or the conditions of the task. For example, adjusting the height of the hoop, the size and weight of the ball, or the shooting technique may enable that same person to successfully achieve the task goal thereby creating an alternative that affords success.

Offering unattractive or dissimilar alternatives is similarly equivalent to offering no alternatives and may decrease feelings of motivation and control (Fullwood, 1990). Unattractive alternatives are those that the individual does not prefer but from which must nevertheless choose. The same holds true for dissimilar alternatives, such as asking a person to choose between being a substitute player or scorekeeper when on the floor play is preferred. When alternatives are beyond the capabilities of the individual, unattractive, or dissimilar, choice may still be available, but the personal meaning and value will be diminished (Davis & Strand, 2007).
Iyengar and Lepper (2002) and Davis and Strand (2007) found that choosing among alternatives was a powerful intrinsic motivator and enhanced feelings of personal control, autonomy, and empowerment. It has also been found that people participated more freely in activities, rated activities as more pleasant, performed better, and had reduced problem behavior when given the opportunity to make choices (Goodwin & Watkinson, 2000; Harchik et al., 1993). Much of the literature surrounding choice as it relates to individuals with impairments has focused on those with developmental or multiple physical impairments (e.g., Frey, Buchanan, & Rosser Sandt, 2005; Shevin & Klein, 1984; Treece, Gregory, Ayres, & Mendis, 1999). In addition, research has often focused on choices among limited alternatives in closely controlled environments. For example, Datillo and Barnett (1985) examined the affective responses of four children aged 8–12 years with developmental impairments when given the choice of participating in a leisure activity by turning a video recorder on or off. When turned on, the video recorder played an age appropriate television show. The children demonstrated more positive facial expressions and vocalizations when they were given the opportunity to turn the television show on or off.

By examining the affordances that an environment provides, people may be able to identify skill and movement form alternatives and choose among them to successfully meet task goals. An affordance is an opportunity or potential for action that a particular environment offers (Gibson, 1977) and can be thought of as the physical environment, objects, or personal alternatives from which individuals may choose when carrying out specific tasks. Ultimately, affordances mediate the number and variety of alternatives from which a person may choose. Similarly, constraints are the features of the environment and the performer that can impinge upon the number and variety of available alternatives (Davis & Burton, 1991). Although the environment may afford certain alternatives, individuals must also perceive these affordances and choose to act upon them or have the supports of others to act on their behalves. According to Gibson (1977), a person may have misperceptions of the existing affordances if the information available is inadequate, or if the process of perceiving the available information is deficient.

Over the years, numerous forms of task analysis have evolved (e.g., developmental task analysis, hierarchical task analysis; Goodwin, 2003) as a means of systematically breaking down complex motor skills (e.g., throwing, catching, kicking) into subcomponents for the purpose of instruction. An underlying assumption of traditional task analysis is that neural-maturation is primarily responsible for motor development and with maturation, typical motor development patterns unfold at a rate and in a form that is similar across most people (Thelen & Smith, 1994). A further assumption underlying traditional task analysis is that the musculoskeletal systems of the learner are intact. However, we know that changes in the structure and function of the body (e.g., muscular imbalance, loss of sensation) can make achievement of typical movement patterns difficult or impossible for some people with impairments (Gelinas & Reid, 2000; Kalnins et al., 1999). One of the fundamental criticisms of traditional task analysis is the failure to take into account impairment imposed movement patterns (Goodwin, 2003).

Ecological task analysis (ETA) was proposed by Davis and Burton (1991) as a way to address the limitations associated with traditional task analysis approaches for motor skill instruction for individuals with impairments. The central tenet of ETA
is that motor skills, movement forms, and performance outcomes are the result of the dynamic interaction among the task goal, the environment, and the capabilities and intent of the performer (Davis & Burton, 1991). ETA differs from traditional task analysis instructional strategies in that it identifies movement tasks in terms of function or what needs to be accomplished (e.g., propel an object) rather than skill (e.g., throw). The task “should not be a skill, like throw or jump, but a function. . . . Once the functional behavioural objectives are established, then the specific skills that may be used to carry out the task (there will usually be more than one) can be identified” (Davis & Burton, 1991, pp. 166–167.) Ecological task analysis breaks down specific task goals into the fundamental components of environment, task, and performer to pinpoint potential sources of performance difficulties and to facilitate instruction (Burton & Davis, 1996). The ecological task analysis framework can be used to manipulate variables within the person-action system to enable success and provide challenge for an individual on a given task.

ETA has applicability to physical education contexts, assessment of playground skills, and coaching (Kidman & Davis, 2007; Mohora, 2007; Watkinson & Causgrove Dunn, 2003). ETA consists of four steps (Davis & Burton, 1991). In step one the instructor establishes the task goal, for example propelling an object with accuracy (often within the framework of a curriculum), then structures the physical and social environments specific to that task goal. The second step introduces choice by allowing the performer to select a movement solution from among alternatives that would achieve the task goal (Davis & Burton, 1991). This means the person chooses the skill (e.g., throwing, rolling, or striking an object) and movement form or how the skill will be executed (e.g., overhand or underhand). In step three of ETA, the instructor may offer environmental and task performance alternatives such as shortening the distance to the target, increasing the size of the target, changing the stability base of the individual (e.g., standing, sitting, stationary, moving), or changing the characteristics of object (e.g., size, weight, type of material). In step four, the instructor observes the choices made, and while honoring those choices, evaluates and manipulates relevant task dimensions to facilitate learning.

Steps two and three of the ETA model incorporate the concept of choice as a fundamental process for solving a movement problem and achieving a task goal. As the first step of selecting the task goal may already be established by curriculum guidelines, it is this second and arguably most important step that places the person at the center of the learning process (Davis & Burton, 1991). The individual’s voice is heard as she or he identifies and chooses among the relevant skills, movement forms, and environmental affordances.

“Although the importance of the social and emotional as well as physical environment is noted in ecological task analysis, details of its structure and effect on motor development have yet to be explicated within this framework” (Burton & Davis, 1996, p. 291). As making choices is part of the more complex processes of decision making and problem solving (Wehmeyer et al., 1998), understanding how people experience making choices in physical activity contexts, whether they perceive and attend to the affordances in the environment, and the importance of the social and emotional environment may have important implications for how we instruct and structure physical activity environments (Taylor et al., 2007).

ETA, which is grounded in affordance theory, where people perceive their environments in terms of functional utility, provided the conceptual framework for
this study. The purpose of this exploratory study was to describe experiences of choice\textsuperscript{1} in physical activity contexts for adults with mobility impairments.

**Method**

A qualitative interpretive phenomenological approach was used to describe the participants’ shared lived experiences of the phenomenon of choice to create a common understanding of its meaning within the context of physical activity (Smith, Flowers, & Larkin, 2009; van Manen, 1997). A phenomenologically informed approach was well suited to the study as it is aimed at bringing deeper understanding of the nature and meaning of a phenomenon by describing it as closely as possible to the way in which it was experienced within the context in which it took place (e.g., Giorgi & Giorgi, 2003; Heah, Case, McGuire, & Law, 2007; Standal, 2011; Zitomer & Reid, 2011). Ethics approval and informed consent were obtained before initiation of the study.

**Participants**

The participants were purposefully selected (Creswell, 2007) to include males and females, those 18–25 years of age, adults with mobility impairments (insiders to impairment), and those who participated in organized disability sport on a regular bases (Peters, 1996). Three females and two males, between the ages of 18–23 years (mean = 20) with mobility impairments (spinal cord injury and neurological impairments) participated in the study. Three of the participants used wheelchairs full time and the other two used wheelchairs mainly for traveling long distances and participation in physical activity. One participant identified as being of Aboriginal ancestry, while the remaining four identified themselves as Caucasian. Four of the participants were full time university students and one participant worked part-time. With the exception of one participant who had recently retired from sport, all of the participants reported being physically active on a daily basis, including dance, wheelchair basketball, wheelchair rugby, wheeling for leisure, weight training, and swimming.

**Data Collection**

Data collected was completed by the first author and consisted of two semistructured individual interviews, artifacts, and field notes (Creswell, 2007; Smith et al., 2009). Each participant completed two semistructured individual interviews. The interview guide questions were inductively generated (i.e., not dictated by theory) and reflected thinking, feeling, and knowing questions (van Manen, 1997). Although inductive in nature, the questions were positioned within the existing literature and the conceptual framework of ecological task analysis. Probes were used to clarify understanding of the questions and the meaning of answers as required.

The first interview was approximately one hour in length during which time the participants answered questions related to choice experiences: “Tell me what you think about when you complete a motor task.” “What alternatives were available to you?” “What choices did you make and why?” The second interview provided an opportunity for the interviewer to probe ideas shared in the first interview and
for the participants to expand upon their experiences. The second interviews were completed within eight weeks of the first interviews. The interview questions included the following: “What were you thinking about when you made the choice you did?” “How did you feel after making your choice?” and “How would you change the choice(s) you made?” The participants’ reflections were augmented with a personal written story (artifact) that was discussed in depth at the second interview. They were asked to write a story in no more than three pages, double spaced, in response to this: “Tell me about a time when making a choice in a specific physical activity task was memorable for you.” The writing task was discussed at some length to ensure the request was clear. All participants were able to quickly indicate that they had an idea of a particular moment about which they were going to write.

Writing stories enabled the participants to examine their experiences by looking inward at the feelings, hopes, and reactions as well as outward to the environment in which the experiences took place (Clandinin & Connelly, 2000). The opportunity to write the stories following the first interview enabled the participants to think further about the experiences already shared while also thinking forward about what they would like to add about their experiences in the second interview. One of the participants e-mailed a completed story in advance of the second interview, while the other participants wrote or had their stories transcribed at the beginning of the second interview. All interviews were audio-recorded and transcribed verbatim. Field notes were recorded to describe the context of the data collection process, including where the data collection took place, interactions that occurred, and reactions of the initial reflections on the meaning held within the stories (Patton, 2002).

**Data Analysis**

A thematic line-by-line analysis was completed to tease out what we consider to be essential meanings from the stories by reducing, reorganizing, and combining the data (Ely, 1991). This data analysis process entailed (a) reading the interviews and field notes numerous times, (b) dividing data into common statements and coding them with meaningful labels, (c) grouping the codes into clusters of meaning (invariant thematic concepts) across participants, and (d) compiling descriptions of the themes and subthemes (Smith et al., 2009). The authors coded and labeled the data separately and then collaboratively determined the themes. Variances were discussed until common relational understanding was reached.

Trustworthiness, or the believability, accuracy, and truthfulness of the research was built into the research by systematically checking the process of data collection, maintaining focus on the research question and monitoring the fit of the data and the conceptual work of analysis and interpretation (Morse, Barrett, Mayan, Olson, & Spiers, 2002). The criteria for ensuring trustworthiness included credibility, authenticity, criticality (Whittemore, Chase, & Mandle, 2001) and transferability. Credibility, or the extent to which both the findings and the researchers are believable and convincing, is addressed by answering the question “Do the results of the research accurately reflect the experience of the participants or the context in a believable way?” (Whittemore et al., p. 534). Credibility occurred through field note documentation, peer debriefing of the coauthors, and use of multiple data coders. The participants also completed a two-stage member check. They confirmed that the transcripts were accurate and no information was added or deleted.
from any of the interviews. Three of the five responded positively to an e-mail that included the theme labels indicating that they recognized themselves in the theme descriptions. A fourth participant also confirmed the accuracy of the findings in person. The final person did not respond to the invitation to provide feedback on the analysis of the findings.

Authenticity or how accurately the findings reflected the participants’ experiences was established through verbatim transcription of all of the interviews and the use of direct quotations to illustrate the themes (Lincoln, 1995). Criticality is found in the answer to “Does the research process demonstrate evidence of critical appraisal?” (Whittemore et al., 2001, p. 534). Criticality was established through methodological (interviews, artifacts, field notes) and researcher triangulation (Richards & Morse, 2007). The researchers had backgrounds in qualitative inquiry and adapted physical activity instruction. Finally, theoretical data saturation was felt to have been achieved as the data fit into the analysis system without the emergence of new themes (Marshall, 1996). While each participant had individualized experiences, there were common experiences across all of participants (Creswell, 2007).

Transferability or how well the knowledge could be applied from one context to another was enhanced by providing a description of the participants thus enabling the reader to decide how the information might be applicable to other similar contexts. In addition, purposeful sampling was used as the intent was to describe the experiences of a specific group of people in a specific context.

**Results and Discussion**

The intent of this exploratory study was to describe experiences of choice in physical activity contexts for adults with mobility impairments, an area that is poorly understood (Wehmeyer et al., 1998). The participants’ experiences were dynamic and involved identifying functional movement alternatives that best matched the identified task goal by monitoring the environment (physical and social), using equipment effectively, and knowing their abilities and those of their teammates and opponents. The participants demonstrated that they had developed the skills and experience necessary to make effective choices and to learn from the outcomes of those choices in the physical activity contexts (Prosser, 1992; Rossow-Kimball & Goodwin, 2009; Wehmeyer, 2003).

While they took part in a range of physical activities and each had unique experiences to share, three themes encapsulated prechoice, choice, and postchoice experiences: (a) **interpreting the setting** — awareness of the physical and social environments, utility of equipment, and personal and performance variables; (b) **choosing among the alternatives** — analyzing performance alternatives and making choices; and (c) **implications of choices made** — learning from the outcomes of choices. Subthemes provided further explanation of each theme (see Table 1).

**Interpreting the Setting**

When the participants were asked what they thought about when making a choice, their responses began with the caveat, “Well, it depends.” The participants interpreted the setting prior to make a movement choice. Potential movement alternatives were identified by having an awareness of physical and social environments, availability and utility of equipment, and personal and performance variables.
The experience of choice involved an awareness of the impact on performance imposed by the physical environment. Playing surfaces and the weather were of particular importance to the participants and afforded or constrained their performances (Davis & Burton, 1991). When asked how the environment impacted his experience of completing a layup in basketball, Ryan immediately pointed out, “It depends on the flooring I suppose. Whether it’s a good floor or a bad floor. . . . Good floors are smooth.” A bad floor for a wheelchair basketball layup, according to Ryan, was a force absorbing cork floor. In contrast to Ryan’s experience, a smooth floor that offered limited resistance (cushion) and friction (newly waxed) constrained Dawne’s ability to maneuver her wheelchair with precision and accuracy while dancing. Compensating for qualities of the floor surface meant Dawne had to alter her speed leading into and following spins as well as the forces used during spins. Dawne explained:

If it’s a slippery floor my spin is going to be quite a bit slower because I’m going to be spinning out. The surface that we’re moving on makes a huge difference.

If it’s say a wood floor that’s just been waxed, I’m not going to go very fast; I’m not going to go very far. . . . We can’t stop either on a slippery surface, generally.

Emily, who often trained and competed outdoors for wheelchair racing, spoke about the environmental factor of weather and how it influenced her movement choices. Wheeling in the rain, for example, altered the movement form Emily used from that of fair weather racing. She spoke of sacrificing speed for a much needed increase in movement precision:

Rain affects your push because typically in rain you can’t rely on power so much. If you try to hit the rim with all your force you’re more likely to slide right off. . . . You have to concentrate more on squeezing in and making sure that contact is solid.

Experiences of personal control were evident in the participants’ interactions with the physical environment (Wehmeyer, Agran, & Hughes, 1998). Performance alternatives were identified to address physical barriers encountered in the learning environment (Davis & Burton, 1991).
Social Environment. The people referred to most often within the participants’ social choice making and physical activity environments included coaches and teammates. The coaches played a key role in providing the participants with the foundation to develop the skills and movement forms needed to complete specific tasks. Ryan explained, “Coaches are responsible for showing me how to do it . . . to give you the foundational knowledge of the proper way to do it, or work with you to find out what’s the best way for you to do it.” Emily also explained that she took her coach’s advice very seriously when choosing the best way to perform her stroke in wheelchair racing, specifically related to relative timing, force, and technique that she would then integrate with environmental considerations (e.g., rain, wind) and personal constraints (e.g., technical skill). Emily relayed:

We are working on my stroke technique. I’m just trying to think about all the things that John [the coach] is telling me about, so driving through, squeezing in, getting the flick. He’s trying to get me to drive through with my head a bit more to get more downward force.

In an integrated dance environment, the choreographer was important to the generation of the overall subject of the dance and its component; however, the movement solutions were left to the dancers. The evaluation and ultimate choices made rested with the dancers as they evaluated, discarded, and refined movement forms. Dawne explained:

It’s a cooperative thing. Marlene [the choreographer] has ideas, she throws them out there, tells us to figure out how to do them, because really no one knows how to use the chair better than we do. . . . Marlene will give input but we have to try them and if they don’t work we have to figure out alternatives.

The opportunity to choose among performer generated alternatives can be intrinsically motivating as feelings of autonomy and control is enhanced (Iyengar & Lepper, 2002). The cooperation between the choreographer and the dancers underscored the open enjoyment and engagement in the dance activities shared by Dawne (Harchik et al., 1993).

The participants also described the negative experiences or consequences of accepting coach directives in support of technically superior performances. Constraints can impinge upon the number and variety of available movement alternatives (Davis & Burton, 1991). Andrew described how a movement choice in basketball that was technically correct according to the coach, could result in poor short term performance. Andrew explained, “A coach will always encourage you to take a left handed shot, but if it’s the last shot of the game and you miss, you made the right choice but at the same time it wasn’t the right choice.” In this instance, there were no movement alternatives available if the coach’s wishes were to be followed. The decision must then be based on preference that falls along a continuum of acceptance and rejection (Davis & Strand, 2007).

In the individual sport of wheelchair racing, teammates and opponents played a role in the movement form alternatives that Emily used. Teammates provided a legitimate performance alternative to Emily. She possessed the skills to take advantage drafting in wheelchair racing, making it a meaningful choice for her (Fullwood, 1990). She described the practice of drafting, an important aspect in long distance
races. Taking advantage of drafting required careful attention to interpreting the setting and the link between what the lead racers afforded her and the implications of changing environmental conditions, race strategy, and movement form to remain competitive. Emily recalled:

In a draft, someone in front can surge, like excel forward and you have to catch up. And so you have to go from a long relaxed stroke to suddenly more of a start stroke, very short so you can pick up speed very fast to get back in there. The same can happen if they slow down, 'cause you have to slow down your stroke.

**Equipment.** Each of the participants spoke about their choices of equipment and how they modified and personally tailored equipment to meet their functional abilities. The affordances offered by equipment choice and selection mediated the number and variety of movement alternatives available to the participants (Davis & Burton, 1991). For example, the selection or configuration of wheelchairs occurred far in advance of the performance of a specific skill or movement form; however, these choices impacted their ability to complete functional movement tasks. Ariel described specific adaptations to her wheelchair that enabled her to explore and perfect movement forms for passing in wheelchair rugby. Adding straps for her feet meant she was able to use the muscle spasticity associated with her cerebral palsy to increase her stability. The straps in concert with a modifying back on her wheelchair increased Ariel’s ability to impart increased force to the ball. Ariel explained:

My back bar is back more so I can lean farther so I can get more force on the ball when I’m going to throw a pass. If I didn’t have my strap on my feet, the ball wouldn’t be able to move off my hand because when I throw I use my feet to [impart] force the ball.

Conversely, Dawne chose a wheelchair with a higher back that could accommodate torso bracing so she could develop functional movement forms required for dance. She recalled, “We modified the chair so that the back was higher. It comes past my shoulder blades now. Normally it comes up halfway up the back, but that just doesn’t work for me with my lack of balance.”

Emily spoke at some length about the importance of the gloves she used in wheelchair racing. She examined alternatives in materials, shapes, and the manner in which the gloves functioned. Choice in equipment selection was experienced as fundamental to her success in wheelchair racing. Emily explained:

I’d say the biggest choice we have is the type of glove we use. It’s still fairly new, the development of hard gloves, which is what I push with. It’s plastic that’s been formed to your hand, so it’s individual for everybody. It’s shaped to your hand and the way that you contact the rim, the way you come off the rim.

**Personal Abilities and Performer Variables.** The participants all actively recognized and took into consideration their own personal abilities and limitations when identifying and choosing among movement alternatives, demonstrating they possessed the experience and knowledge necessary to make effective choices (Schloss et al., 1993). Ariel described taking her knowledge of how her body worked into account when explaining why she chose to use a baseball pass over
other forms of object propulsion in wheelchair rugby. She explained, “I’ve always had troubles being able to do certain things because I am shaky. . . . The baseball pass is best for me because I have more control on my right.”

In dance, Dawne also explained how she created movement solutions that fit best with her abilities. As Dawne’s torso was fixed to the wheelchair to facilitate her balance and stability she recognized that her functional movement alternatives would be related to the orientation of not just her body in her wheelchair, but her wheelchair itself. She changed the position of her wheelchair in relation to the other dancers, thereby providing precision to her movements overall, replicating and synchronizing the movement of the other dancers using a movement alternative that was legitimate and meaningful to her. Dawne recalled:

Some of us can do some things, and some of us can’t. The stuff with backbends, I can’t do at all. I can’t twist my back in any way, shape, or form. I have no use of my torso in that regard. I can’t even do a little simple twist in my shoulder blades. I have to compensate where my chair sits to replicate what they were doing so the lines were right.

The participants were clearly able to identify and articulate factors that impinged upon and guided the alternatives they perceived available to them in the execution of movement forms required to successfully meet identified task goals (Davis & Strand, 2007). They demonstrated a connection among movement, cognition, and creative problem solving (Pagnano & Griffin, 2001). They often did so independently of coaching input, using their own creative problem solving and understanding of the interaction between the task goal, the environment, and their own capabilities (Davis & Burton, 1991).

The participants interpreted the setting in advance of making a choice of movement form to achieve the task goal by recognizing environment, equipment, and personal affordances such as the performing surface, the features of their wheelchairs, and the social implications of the choices made (Davis & Burton, 1991). It is worth noting that what was considered a meaningful alternative by one participant was not necessarily a meaningful alternative to another, highlighting the contextual specificity of choice. A low back wheelchair was not meaningful for Dawne in dance yet was essential to Ariel’s success in rugby.

**Alternative Selection**

Alternative selection described the participants’ experiences of analyzing choices of performance alternatives. They contemplated possible outcomes, the risks involved, and the chances of success or failure of alternatives. Despite their analysis, the participants were often unable to describe exactly why they made a particular choice, but rather stated, “It just felt right” or “It just felt natural.”

**Identifying Alternatives.** The participants were able to quickly generate a list of skills and movement form alternatives for their chosen sports task goals, reflecting the dynamic interaction identified in ecological task analysis that occurs among the task goals, the environment, and the intent of the performer (Davis & Burton, 1991). Andrew was particularly articulate at discussing each of the movement alternatives from which he could choose for the skill of a layup in basketball. Andrew explained:
If you’re going in for a layup from the left side and you’re right handed, you can shoot a left handed shot, you can shoot a right handed shot, you can shoot a left handed reverse shot, or you can shoot a right handed reverse shot. Or you can do an overhand right handed shot or a left handed shot. . . . those are some choices. I mean there’s a huge variety of choices to make just in a layup. I mean, proper form is to use your left hand on the left side of the basket and your right hand on the right side. But you have a choice even still, do you want to use a scoop or do you want to do an over?. . . In wheelchair basketball you tilt up to get extra space between you and the defender, but you also lose some of your balance. I could be under the basket and throw up maybe a reverse shot or I can turn around and take a squared up shot which is more likely to go in, but it’s also not as quick.

Similarly, Ariel identified the various forms that a pass to a teammate in rugby could take. She also knew quite clearly, based on knowledge of her own abilities and from experience, the optimal movement form for her pass. She recalled, “Well you could do a chest pass, bounce pass, a baseball pass, or a hook pass. The baseball pass is my most accurate and strongest.”

Choosing Among the Alternatives. With the alternatives identified, the participants described their experiences of choosing the preferred performance based on their evaluation of the alternatives. These descriptions of the processes the participants used in making choices illuminated a poorly understood area of creative problem solving (Pagnano & Griffin, 2001; Wehmeyer et al., 1998). The main criterion used to evaluate the alternatives appeared to be the performers’ perceived degree of success in completing the task. Although the participants understood that it was important to consider the alternatives and make a choice that would lead to success, the participants also discussed overanalyzing the alternatives, to the point where over-analysis led to missed opportunities and decreased focus on the task. Emily reflected on her tendency to over-think all the alternatives impacting her success in racing. She had actually developed a reputation for over-thinking during a race that interfered with her ability to focus on the skill and movement form required for success. For Emily, the consistency and effectiveness of her stroke depended on her choice to remain calm and only think about what she needed to do in that moment. Over-thinking and a lack of focus were detrimental to her performance. She recalled:

I’ve kind of gained a reputation for over-thinking everything and it’s more of a distraction. It’s about trying to calm down and look internally and think about nothing except for your stroke and what exactly you are doing in that moment. I can get mentally distracted relatively easy because I overanalyze everything and I’m always thinking about stuff. Um, so I’ve blown strokes just simply because I’m not focused enough.

When Ryan discussed basketball shooting, he explained: “I could have passed it off. I’m not a grand shooter, but I wanted a shot. It felt right. Things can just feel right and it felt right.”

Emily explained her choice of movement form for wheelchair racing as follows: “As far as stroke and technique, as I said, it’s the basic fundamentals and then it’s just kind of what feels natural and what feels right to you. . . . that’s how
you do it.” Andrew also agreed that “it’s kind of weird, it’s almost like, it’s not exactly subconscious but it’s not really thinking deliberately either. It’s kind of, I don’t know. It’s really sort of what you feel like in that situation.”

Although not articulated by the participants, choice making may be the natural outcome that occurs when a match of a skill or movement form alternative to the task at hand is made given the environmental context. It just feels right may be reflecting a sophisticated process of interpreting the setting, generating meaningful and legitimate skill and movement alternatives, and evaluating them for suitability in meeting the task goal. The alternatives held differing values to the participants depending upon their skill level and their success in meeting the task goal because of choices made (Davis & Strand, 2007). The preferred alternatives, although legitimate in that they were within the boundaries of the participants’ skill repertoires, were not always meaningful to them due the negative social consequences that resulted if the task goal was not met (e.g., scoring a basket; Fullwood, 1990).

The context in which the participants found themselves also impacted the meaningfulness of the available alternatives from which to choose (Taylor et al., 2007). A choice made based on alternatives available in a practice environment where making errors and learning from them was expected became less preferred and meaningful in a competitive environment where the consequences of a negative social outcome became a reality (e.g., stigmatized for letting the team down; Davis & Strand, 2007).

**Implications of Choices Made**

*Implications of choices made* described the participants’ experiences after choices had been made and acted upon. The participants described looking back at a choice and discussing whether it was a “good” choice or a “bad” choice. Good choices were often ones that led to a favorable outcome, such as scoring points or successfully learning a new skill. Bad choices often resulted in failure to complete particular tasks that could also disappoint team mates. The implications of the choices made were also contextualized by whether the participants were engaged in a practice or competitive setting.

**Good Choices, Bad Choices.** A favorable outcome occurred when environmental conditions supported the application of an optimal movement solution to meet the requirements of the task. Ryan described the experience as “It worked, it worked and I was thrilled. . . . Afterwards it felt good. It felt really good, that the basket went in and everyone was cheering, and that’s a good feeling.”

Unfortunately, with good choices also came bad choices. Often this equated to a choice that resulted in failure, such as missing a basket and losing the game. The social consequences of incorrect choices on subsequent choices and the learning environment have not been explored (Wehmeyer et al., 1998). For the participants of this study, the emotional outcome of a bad choice was often frustration, failure, and disappointment. Andrew explained:

A shitty feeling is probably the best way to describe it. It’s not a good one. You kind of feel like, not only did you let your team down, but you made a mistake, and I mean no one wants to make a mistake in the game.
Ryan shared a story of learning to shoot with one hand. He experienced repeated failure and started to doubt his own choice to persist with that movement form for shooting. Looking back on that experience he thought, “This is crap, why am I doing this? Always over the net or missed it completely . . . it was frustrating . . . completely screwing up.”

**Reaction of Others.** When analyzing the outcome of a choice, the participants talked about taking into account the reactions of others, including their coaches, teammates, and even the spectators. A movement alternative is meaningful if it has personal value; however, when the consequence of acting on that alternative is negative, motivation to be creative in future problem solving may be compromised (Davis & Strand, 2007). Reactions of others were described primarily in negative terms. When Ryan thought about the possibility of making a mistake, he feared the rejection of his teammates because he might let them down. He recalled, “Fear of my teammates . . . like fear of them saying ‘oh why did you do that?’ sort of thing, or something that is discouragement. . . . I don’t like to disappoint my team.” Andrew also commented on the possible negative reaction of teammates when his choice of a skill during a practice did not have a strong outcome, resulting in tension between himself and his teammates:

> If you tried new things, and let’s say practices didn’t go well and someone like got in your face and was like, “What were you doing? That was a horrible shot!” You’d be like, you’d be kind of choked, and that would probably piss you off a little bit.

**Learning From Choices Made.** The participants revealed that they regarded making choices differently in a learning and practice environment, compared with a game or competitive situation. When learning a new skill or a new way of doing a skill in practice, the participants’ experiences included stories of willingness to persist at their learning in the face of failure.

Emily felt that when she was first learning to do her stroke in wheelchair racing the choice of movement form was awkward and uncomfortable, yet something that would improve with practice. She knew that initially it was going to be challenging and awkward, but still persisted until her stroke felt natural and efficient. She recalled:

> When you first sit in a racing chair, with the size of the push rim and the way it’s set up and the way that you’re all kind of scrunched in there, it can feel really awkward to try and get the timing right to actually hit the push rim . . . just learning how to do that and getting comfortable with it, then you can go faster.

The participants spoke at length about the potential to learn from their experiences with making choices. With experience, the participants gained confidence in their abilities to make choices and experienced a sense of personal control in their own learning (Wehmeyer et al., 1998). Ryan recalled, “I make the right choices sometimes. You get more confident with something by doing it over and over and then you’re not afraid anymore.” Andrew also discussed the importance of learning from mistakes, or bad choices, saying that it was important for him to “accept that something’s crappy, you made a mistake, and then learn from it on the go and
continue playing the game.” Furthermore he felt that it was essential to learn from bad choices:

Cherish mistakes because you always learn from them. So the more you make mistakes, the more you learn, and the more you try new things, and if it doesn’t work, then it doesn’t work, that’s that, but if it does work then it’s something new you can use. . . . In the case it doesn’t work, you won’t do it next time, or you’ll do it another way.

The sense of personal control held by the participants in their experiences of choice reflected the ability to choose among alternatives, serving as a motivator and being endemic to autonomy and empowerment (Iyengar & Lepper, 2002; Harchik et al., 1993). There were implications to the choices made depending on their evaluation of whether the choice made was a good one or a bad one and the reaction of others. While the participants experienced, recognized, and acted on affordances to choice, they also experienced constraints in movement form alternatives. This was particularly apparent when coaches requested strategically correct movement forms (outside basketball shots) when the performer did not see it as legitimate alternative given existing skill levels and the social consequences that may result from failing in meeting the task goal. In the empowerment coaching model discussed by Kidman & Davis (2007), the role of the coach was transformed from that of relaying standard skill performance expectations and their criteria (e.g., “Do as I say”), to asking the participants to consider their choices in goal setting, manipulating environmental variables, and thinking reflectively about the choices made and their outcomes. Further inquiry that takes into account Zimmerman’s (2000) three phased model of self-regulation (goal setting, self-observation, self-evaluation) would be of relevance to future research on the impact of choice and effective coaching and coach education.

**Conclusion**

In conclusion, the five assumptions that defined legitimate and meaningful choices were reflected in the participants’ experiences. Their sports contexts afforded them a range of alternatives and they clearly articulated their ability to identify available alternatives from which to base their choice making (Fullwood, 1990). The participants expressed and acted upon preferences among the alternatives available to them, making choices based on their legitimacy and meaningfulness (Davis & Strand, 2007; Shevin & Klein, 2004). Utilization of the affordances in the sport contexts demonstrated that the participants were capable of not only perceiving and acting on them but actively seeking them out (interpreting the setting; Gibson, 1977; Goodwin & Watkinson, 2000).

Furthermore, the participants were able to identify and evaluate a wide variety of movement forms that could be used to achieve the task goals. The participants explored the different alternatives through experimentation and practice, and ultimately chose those that would have the greatest chance of success (it just felt right). They then learned from the outcome of their choices (implications of choices made). Although the participants did not necessarily realize that they were engaging in a process akin to the ecological task analysis framework and did not use terms such as affordances and constraints or movement forms and task goals, their
ability to engage in the choice making process shows that ETA may very well be an effective instructional tool in physical activity contexts (Davis & Burton, 1991). The use of these components by experienced performers may suggest that novice or less experienced performers may benefit from structured instruction or coach guided learning experiences that highlight strategies for maximizing opportunities for choice in environmental (e.g., sports equipment, space, rules), task goal (e.g., movement form and outcome), and performer variables (e.g., wheelchair specifications, using body in ways to optimize balance or strength; Davis & Burton, 1991). The experiences of the participants of the study highlight the importance of choice in maximizing performance and creating a social and emotional environment that promotes participant autonomy and goal achievement (Taylor et al., 2007). Moreover, ETA may prove to be a useful pedagogical tool for instructional and coaching settings that seek to promote fundamental and sport specific skills development.

There are a number of limitations to the study that impact its transferability to other contexts. Although the intent of this exploratory study was to provide in-depth insider descriptions of a few participants, the sample size was small and data saturation cannot be claimed (Creswell, 2007). As the functional abilities of those with differing impairments are distinct (e.g., cerebral palsy, spinal cord injury), further research into the experiences of choice of these subgroups is warranted. Similarly, research into choice in other sport and physical activity contexts beyond those represented in this study, across levels of expertise (e.g., experts, nonexperts, and novices) as well as the role of coaches, is needed (Ericsson & Lehmann, 1996; Kitsantas & Zimmerman, 1998, 2002; Ward, Hodges, Starkes, & Williams, 2007; Zimmerman, 2000; Zimmerman & Kitsantas, 1997).

End Note

1 For the purpose of this study, choice making will be delimited to within-task choice making as described in the Ecological Task Analysis Model (Davis & Burton, 1991). For clarification, this means that the phenomenon of interest is the experience of choice that occurs within an identified task goal (e.g., object propulsion). This is in contrast to the choice making that may be involved in selecting between two participation alternatives (e.g., being goal keeper or being score keeper).

References


