1-1-1997

Factor Structure of the Athletic Identity Measurement Scale With Athletes With Disabilities

Jeffrey J. Martin
Wayne State University, aa3975@wayne.edu

Robert C. Eklund
University of Western Australia

Carol Adams Mushett
Georgia State University

ADAPTED PHYSICAL ACTIVITY QUARTERLY, 1997, 14, 74-82

Factor Structure of the Athletic Identity Measurement Scale With Athletes With Disabilities

Jeffrey J. Martin
Wayne State University

Robert C. Eklund
University of North Dakota

Carol Adams Mushett
Georgia State University

Individuals who perceive themselves as "athletes" are thought to have self-schemas composed of, in part, an athletic identity (Brewer, Van Raalte, & Linder, 1993). The recent development of the Athletic Identity Measurement Scale (AIMS) has allowed sport psychology researchers to assess athletic identity. Research with adolescent athletes with disabilities has suggested that the AIMS is composed of 4 factors (Martin, Mushett, & Eklund, 1994). The purpose of the current study was to further examine the psychometric properties of the AIMS. Seventy-eight international swimmers (34 females, 44 males) with disabilities, ranging in age from 12 to 44 (M = 23.4 years), participated in the present study. Using structural equation modeling procedures, a confirmatory factor analysis determined that the data fit the 4-factor model specified in the Martin et al. (1994) study, thus providing support for the multidimensionality of the AIMS.

Sport and exercise science professionals have urged researchers to examine social-psychological characteristics of athletes with disabilities because of a lack of research in this area (e.g., Asken & Goodling, 1986; Depauw, 1988; Henschen, 1988; Ogilvie, 1985; Sachs, 1988; Sherrill, 1993a, 1993b). A recent perusal of the literature suggests that researchers have examined athletes with disabilities by turning their attention to common sport psychology topics such as self-concept, self-efficacy, self-actualization, social support, mood state and anxiety, psychological well-being, goal orientation, athletic identity, and psychological skills (Brasile &

Jeffrey J. Martin is with the Division of Health, Physical Education, and Recreation at Wayne State University, Detroit, MI 48202. Robert C. Eklund is with the Department of Health, Physical Education, and Recreation at the University of North Dakota, Williston. Carol Adams Mushett is with the School of Health and Human Performance at Georgia State University, Atlanta, GA 30303.

Hedrick, 1991; Brasile, Kleiber, & Harnisch, 1991; Cox & Davis, 1992; Greenwood, Dzewaltowski, & French, 1990; Martin & Mushett, 1996; Martin, Mushett, & Smith, 1995; Masters, Wittig, Cox, Scallen, & Schurr, 1995; Patrick, 1986; Sherrill & Rainbolt, 1988; Sherrill, Hinson, Gench, Kennedy, & Low, 1990).

Although psychological research with athletes with disabilities is being conducted, some investigators have suggested that a lack of valid and reliable instrumentation may be a barrier to research with disabled sport participants (Henschen, 1988; Ogilvie, 1985; Sachs, 1988). It appears that few studies have specifically examined the psychometric properties of instruments initially validated with nondisabled athletes (Sherrill, 1993a; Martin et al., 1994). Therefore, the purpose of the current study is to extend previous work examining the psychometric properties of the Athlete Identity Measurement Scale (AIMS) which assesses athletic identity (Brewer, Van Raalte, & Linder, 1993).

Athletic identity refers to the degree to which people identify with the athlete role (Brewer, Van Raalte et al., 1993). Athletic identity is a relevant psychological construct to examine because of the potentially important psychological, social, and behavioral ramifications of an athletic identity. If, for example, an athletic identity is a salient component of one's self-schema, then successful performance in the athletic role will enhance self-esteem (Callero, 1985). In contrast, perceptions of unsuccessful performance may contribute to reduced self-esteem. Role identities, such as an "athletic identity," also are thought to have implications for social relations (Callero, 1985). For instance, athletes with strong athletic identities are more likely to form relationships with other athletes compared to athletes with weaker athletic identities. Finally, beneficial "athletic behaviors" (e.g., training) are likely to stem from a strong athletic identity (Callero, 1985). At the same time, a strong athletic identity may promote overtraining (Brewer, Van Raalte et al., 1993).

The AIMS was developed to assess athletic identity and the strength and exclusivity of the athletic role (Brewer et al., 1991). As noted earlier, individuals with strong athletic identities establish self-concepts premised on their athletic role. However, athletes with an exclusive athletic identity may have emotional difficulty adjusting to nonsport participation (Brewer et al., 1991; Werthner & Orlick, 1986). Initial research has provided some support for this argument as athletes with strong and exclusive athletic identities also reported strong negative affectivity if unable to participate in sport (Martin et al., 1995). Furthermore, Brewer (1990) reported a significant correlation between exclusivity and depression for athletes suffering from a sport injury. Research by Hale and Waalkes (1994) also has suggested that athletes with high AIMS scores were more willing to use performance-enhancing drugs and had less interest in academics compared to athletes with lower AIMS scores.

Parents, coaches, and sport support personal (e.g., athletic trainers, team managers), who understand their athletes' sport identities, are in a position to provide effective support. For example, Brewer et al. (1990) suggested that the AIMS can be used to identify athletes with strong and exclusive athletic identities. Targeting such athletes and providing information on staleness and burnout, for example, may help prevent overtraining, a precursor to burnout. Athletes with strong and exclusive identities may be at risk for emotional disturbance if injured (Brewer, Van Raalte et al., 1993; Martin et al., 1995). Providing such athletes with appropriate counseling services can aid adjustment to injury (Etzel & Ferrante, 1993;

Henschen & Shelley, 1993). Similarly, athletes with strong, exclusive identities, facing transitions out of sport may benefit from enhanced social support and career counseling (Martin & Mushett, 1996; Martin, in press).

Initial research with the AIMS indicates it has sound psychometric properties. Brewer et al. (1990) reported that the AIMS was significantly correlated with self-reports of athletic involvement, thus demonstrating construct validity. Brewer and colleagues (1991) documented convergent validity by finding significant correlations among the AIMS and theoretically and conceptually related instruments (i.e., importance of sport competence, competitiveness). They also showed divergent validity with the finding that athletic identity was unrelated to general and physical self-esteem (Brewer et al., 1991). Finally, in replicating some of Brewer and colleagues research (1990, 1991, 1993), Hale and Waalkes (1994) reported adequate internal consistency ($r = .93$), test-retest reliability ($r = .89$), and adequate construct and discriminant validity for the AIMS.

In their initial AIMS development research with athletes and nonathletes, Brewer et al. (1990, 1993) determined the AIMS was unidimensional because only one factor, *athletic identity*, was discovered. Brewer, Boin, and Petitipas (1993) believed the combined sample of athletes and nonathletes in the Brewer et al. (1990, 1993) study contributed to the unidimensionality of the AIMS. They speculated that with sport populations, the AIMS would prove to be multidimensional (Brewer, Boin et al., 1993). To test this hypothesis, their subsequent research examined 122 collegiate male soccer players and indicated the AIMS was multidimensional with a 3-factor structure described below (Brewer, Boin et al., 1993).

Social identity is the strength with which athletes identify with the athletic role. *Exclusivity* is the degree to which athletes rely heavily on their athletic identity and identify weakly with other roles such as student or friend. *Negative affectivity* assesses negative emotional responses resulting from the inability to participate in sport (i.e., injured, retired.).

Using an exploratory factor analysis, Martin et al. (1994) confirmed the existence of the 3 factors reported by Brewer, Van Raalte et al. (1993) with 57 swimmers with a disability. However, they also reported a fourth factor that they labeled self-identity. Self-identity was constituted by items which captured self-referenced cognitions in contrast to social identity which reflected athletes' perceptions of others' views of them. Martin et al. (1994) speculated that these two factors may have reflected the disabled sport athlete's strong affirmative self-views of athletic identity and their weaker social-based perceptions of how others see them as athletes.

Theoretical support for the multidimensionality of sport identity also can be found in Curry and colleagues' line of research examining sport identity from a sociological perspective (Curry, 1991; Curry & Parr, 1988; Curry & Weaner, 1987; Curry & Weiss, 1989). This line of research has culminated in the development of the Sport Identities Index (SII), which is composed of 5 subscales assessing time in the athletic role, social relations, sport importance, self-role merger, and competition. The refinement of the self-role merger subscale to specifically include items examining the importance of one's perceptions of others' expectations for the sport role, and questions referring to one's own self-based perceptions, corroborates the importance of both types of information when assessing sport identity (Curry, 1993).

In summary, research has shown the AIMS to be a psychometrically sound instrument and a valid measure of athletic identity. Theoretical and empirical work

suggests that an athletic identity has important ramifications for sport participation. However, additional work is needed to confirm the multidimensionality of the AIMS and the emergence of a fourth factor with athletes with disabilities. In order to replicate and extend the research of Martin et al. (1994), an older and larger sample of athletes from disability sport was surveyed. The ability to replicate the 4-factor structure with an older and larger sample should provide increased evidence of the generalizability of the factor structure of the AIMS.

Method

Participants

Seventy-eight swimmers with disabilities competing at the Cerebral Palsy (CP) Games in Nottingham, UK (n = 36) participated in the current study. Swimmers associated with the Australian Sport Institute (n = 42) also participated in the present study.

Instruments

Demographic Questionnaire. This questionnaire asked subjects to report their age, gender, disability, years of competitive experience, and citizenship.

Athletic Identity Measurement Scale (AIMS). The original unidimensional AIMS consisted of 10 items. Subsequent research with athletes with disabilities revealed 9 items loading on 4 subscales assessing self-identity, social identity, exclusivity, and negative affectivity (Martin et al., 1994). This 9-item scale was used for the current investigation (see list below). For each item, subjects responded on a 7-point scale with 7 anchored by *strongly agree* and 1 anchored by *strongly disagree*. Scores ranged from 2 to 14 for the 2-item social identity (Items 3, 7), self-identity (Items 1, 2), and negative affectivity (Items 8, 10) subscales. Scores range from 3 to 21 for the 3-item exclusivity (Items 4, 5, 9) subscale.

Individual Items for the AIMS

1. I consider myself an athlete.
2. I have many goals related to sport.
3. Most of my friends are athletes.
4. Sport is the most important part of my life.
5. I spend more time thinking about sport than anything else.
6. I need to participate in sport to feel good about myself.
7. Other people see me mainly as an athlete.
8. I feel bad about myself when I do poorly in sport.
9. Sport is the only important thing in my life.
10. I would be very depressed if I were injured and could not compete in sport.

Note. Social identity (Items 3, 7), Self-identity (Items 1, 2), Negative affectivity (Items 8, 10), and Exclusivity (Items 4, 5, 9).

Alpha coefficients ranging from .64 to .72 suggested low, but adequate, internal consistency for the 4 subscales (Martin et al., 1994).

Procedures

Coaches and support staff at the CP Games agreed to have their athletes participate in the study. Athletes received a letter describing the purpose of the study, human subject consent forms, the demographic questionnaire, and the AIMS. Due to language considerations, the authors limited data collection to English-speaking teams. Swimmers completed the questionnaires on their own if they were capable or were helped by the authors.

The Australian Swimming Association Technical Coordinator, present at the Cerebral Palsy Games, also was briefed on the study and agreed to collect data. Athletes associated with the Australian Institute of Sport completed packets identical to those used at the CP Games which were then returned to the authors.

Results and Discussion

Preliminary Analysis

A series of MANOVAS were conducted on the AIMS subscales to examine differences attributable to sample source, gender, and country. Results were not statistically significant ($p > .05$).

Descriptive Characteristics

Seventy-eight swimmers (34 females, 44 males) participated in the current study. Distribution according to disability was as follows: cerebral palsy ($n = 45$), amputee ($n = 10$), paraplegic ($n = 10$), les autres ($n = 13$). Athletes in the les autres category were classified as dwarfs or had osteoporosis, spina bifida, etc. Swimmers represented Australia ($n = 50$), Canada ($n = 10$), and Great Britain ($n = 18$). Athletes ranged in age from 12 to 44 ($M = 23.4$, $SD = 8.6$) years and years of competitive experience ranged from 1 to 31 ($M = 5.9$, $SD = 5.2$).

Internal Reliabilities

Internal consistency of items assessing each subscale were determined with alpha coefficients (Cronbach, 1951). Results suggested poor to adequate reliability for the 2-item subscales of social identity (.51), negative affectivity (.62), and self-identity (.66). The 3-item subscale, exclusivity, was slightly higher (.77). Given the small number of items per subscale, these low alpha coefficients were not unexpected and comparable to alpha coefficients reported in Martin et al. (1994).

Factor Analyses

Maximum likelihood structural equation modeling procedures (EQS; Bentler, 1992) were used to conduct a confirmatory factor analysis (CFA). A CFA was conducted in order to determine if the data fit the model specified in the Martin et al. (1994)

study. Standard conditions were specified based on the 4-factor structure identified in the Martin et al. (1994) investigation. Specifically, items were uniquely loaded on appropriate factors, the variance of each factor was fixed at 1.0 to define the scale of latent factors, factors were allowed to correlate, and measurement errors were not allowed to correlate.

The confirmatory model was not found to differ significantly from the independence model ($\chi^2 = 27.18$, p, = .16,24 df). The ratio of chi-square to degrees of freedom (Q) was 1.70, which fell within the desirable range ($Q < 2.0$; Carmines & McIver, 1981). Incremental goodness-of-fit values of .90 or above are considered desirable (Bentler, 1992) and, hence, observed goodness-of-fit indexes also suggested a good fit of the model to the data (Bentler-Bonett Normed Fit Index = 0.87, Bentler-Bonett Non-Normed Fit Index = 0.94, Comparative Fit Index = 0.96).

The standardized maximum likelihood factor loadings and error variances estimated in the confirmatory analysis are presented in Figure 1.

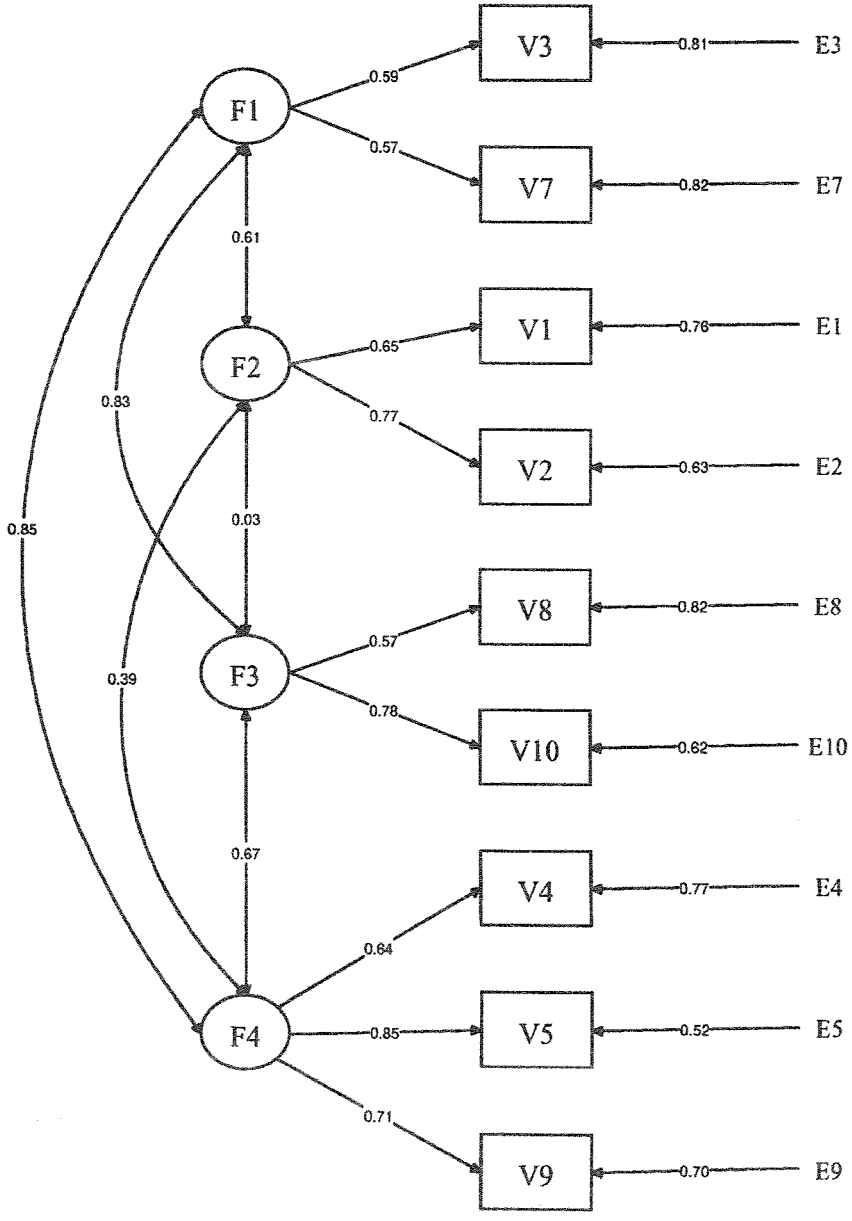
The items are all strong indicators of the factors that they purport to measure with average standardized maximum likelihood factor loadings of .68 (range .57 to .85).

All item loadings were found to be significant ($p < .001$) upon examination of the unstandardized factor loading critical ratios. Examination of the distribution of the 45 standardized residuals also revealed minimal evidence of significant over-or-underestimation of the fitted correlations (89%z < [.01]; 0%z > [.02]), which also suggests a satisfactory fit of the hypothesized factor model. Because small sample sizes and limited numbers of items used to assess factors tend to promote instability when conducting factor analyses (Tabachnick & Fidell, 1989), the ability to confirm the factor structure reported by Martin et al. (1994) provides further evidence for the validity of the 4-factor model with a population of athletes with disabilities.

Although this evidence suggests a favorable conclusion regarding the fit of the hypothesized model to the data, there is evidence recommending concern regarding the 4-factor model. Specifically, the correlations (.83, .85) among factors (see Figure 1) suggest caution. Because the 4 subscales represent related components of athletic identity, moderate correlations found between self-identity and social identity (.61) and between self-identity and exclusivity (.39) would not be unexpected.

However, the magnitude of the correlations between social identity and negative affectivity (.83) and between social identity and exclusivity (.85) indicate, despite the rather favorable fit, that the 4-factor model may not be the most parsimonious representation of the AIMS data (Disch, 1989). Specifically, it is possible that a factor solution requiring few latent variables may be attainable.

In summary, the current study confirmed the 4-factor structure of the AIMS reported in the Martin et al. (1994) study. These results add further support to the multidimensionality of the AIMS and the validity of the 4-factor model. More specifically, the support for both a self and social identity factor substantiates the argument that these two separate, yet related (r = .61) constructs may be particularly meaningful for athletes with disabilities as argued in Martin et al. (1994). However, the strong factor correlations, preliminary nature of this line of research, and limited sample sizes examined in the current and previous research (Martin et al., 1994) suggest the need for continued research in this area.



Note: i) Social identity (F1), Self-identity (F2), Negative affectivity (F3) and Exclusivity (F4); ii) One-headed arrows from factors (circles) to variables (squares) represent factor loadings; iii) Two-headed arrows represent correlations.

Figure 1 — Path diagram of confirmatory factor analytic model.

References

Asken, M.J., & Goodling, M.D. (1986). Sport psychology: An undeveloped discipline from among the sport sciences for disabled athletes. *Adapted Physical Activity Quarterly*, **3**, 312-319.

Bentler, P.M. (1992). *EQS: Structural equations program manual*, Los Angeles: BMDP Statistical Software, Inc.

Brasile, F.M., & Hedrick, B.N. (1991, Summer). A comparison of participation incentives between adult and youth wheelchair basketball players. *Palaestra*, 40-46.

Brasile, F.M., Kleiber, D.A., & Harnisch, D. (1991). Analysis of participation incentives among athletes with and without disabilities. *Therapeutic Recreation Journal*, **First Quarter**, 18-33.

Brewer, B.W. (1990). *Athletic identity as a risk factor for depressive reaction to athletic injury*. Unpublished doctoral dissertation, Arizona State University, Tempe.

Brewer, B.W., Boin, P.D., & Petitpas, A.J. (1993). *Dimensions of athletic identity*. Paper presented at the American Psychological Association annual conference, Toronto, ON.

Brewer, B.W., Van Raalte, J.L., & Linder, D.E. (1990). *Development and preliminary validation of the Athletic Identity Measurement Scale*. Paper presented at the North American Society for the Psychology of Sport and Physical Activity annual conference, Houston, TX.

Brewer, B.W., Van Raalte, J.L., & Linder, D.E. (1991). *Construct validity of the Athletic Identity Measurement Scale*. Paper presented at the North American Society for the Psychology of Sport and Physical Activity annual conference, Monterey, CA.

Brewer, B.W., Van Raalte, J.L., & Linder, D.E. (1993). Athletic identity: Hercules' muscles or Achilles heel? *International Journal of Sport Psychology*, 24, 237-254.

Callero, P.L. (1985). Role identity salience. *Social Psychology Quarterly*, **48**, 203-215.

Carmines, E., & McIver, I. (1981). Analyzing models with unobserved variables: Analysis of covariance structures. *In social measurement: Current issues* (pp. 65-115). Beverly Hills, CA: Sage.

Cox, R.H., & Davis, R. (1992). Psychological skills of elite wheelchair athletes. *Palaestra*, **8**, 16-21.

Cronbach, L.J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, **16**, 296-334.

Curry, T.J. (1991). Fraternal bonding in the locker room: A profeminist analysis of talk about competition and women. *Sociology of Sport Journal*, **8**, 119-135.

Curry, T.J. (1993). The effects of receiving a college letter on the sport identity. *Sociology of Sport Journal*, **10**, 73-87.

Curry T.J., & Parr, R. (1988). Comparing commitment to sport and religion at a Christian college. *Sociology of Sport Journal*, **5**, 369-377.

Curry T.J., & Weaner, J.S. (1987). Sport identity salience, commitment, and the involvement of self in role: Measurement issues. *Sociology of Sport Journal*, **4**, 280-288.

Curry, T.J., & Weiss, O. (1989). Sport identity and motivation for sport participation: A comparison between American college athletes and Austrian student sport club members. *Sociology of Sport Journal*, **6**, 257-268.

DePauw, K.P. (1988). Sport for individuals with disabilities: Research opportunities. *Adapted Physical Activity Quarterly*, **5**, 80-89.

Disch, J. (1989). Selected multivariate statistical techniques. In M.J. Safrit & T.M. Wood (Eds.), *Measurement concepts in physical education and exercise science* (pp. 155-179). Champaign, IL: Human Kinetics.

Etzel, E.F., & Ferrante, A.P. (1993). Providing psychological assistance to injured and disabled college student athletes. In D. Pargman (Ed.), *Psychological bases of sport injuries* (pp. 263-283). Morgantown, WV: Fitness Information Technology, Inc.

Greenwood, C.M., Dzewaltowski, D.A., & French, R. (1990). Self-efficacy and psychological well-being of wheelchair tennis participants and wheelchair nontennis participants. *Adapted Physical Activity Quarterly*, **7**, 12-21.

Hale, B.D., & Waalkes, D. (1994). *Athletic identity, gender, self-esteem, academic importance, and drug use: A further validation of the AIMS*. Paper presented at the North American Society for the Psychology of Sport and Physical Activity annual conference, Clearwater Beach, FL.

Henschen, K.P. (1988, Spring). More on sport psychology's neglected population. *AAASP Newsletter*, 8-9.

Henschen, K.P., & Shelley, G.A. (1993). Counseling athletes with permanent disabilities. In D. Pargman (Ed.), *Psychological bases of sport injuries* (pp. 251-263). Morgantown, WV: Fitness Information Technology, Inc.

Martin, J.J. (1996). Transitions out of competitive sport for athletes with disabilities. *Therapeutic Recreation Journal*, **2nd Quarter**, 128-136.

Martin, J.J., & Mushett, C.A. (1996). Social support mechanisms of athletes with disabilities. *Adapted Physical Activity Quarterly*, **13**, 74-83.

Martin, J.J., Mushett, C.A., & Smith, K.L. (1995). Athletic identity and sport orientation of adolescent swimmers with disabilities. *Adapted Physical Activity Quarterly*, **12**, 113-123.

Martin, J.J., Mushett, C.A., & Eklund, R.C. (1994). Factor structure of the Athletic Identity Measurement Scale with adolescent swimmers with disabilities. *Brazilian International Journal of Adapted Physical Education Research*, **1**, 87-99.

Masters, K.S., Wittig, A.F., Cox, R.H., Scallen, S.F., & Schurr, K.T. (1995). Effects of training and competition on mood state and anxiety among elite athletes with cerebral palsy. *Palaestra*, **11**, 47-52.

Ogilvie, B.C. (1985, Summer). Sports psychologists and the disabled athlete. *Palaestra*, 36-43.

Patrick, G.D. (1986). The effects of wheelchair competition on self-concept and acceptance of disability in novice athletes. *Therapeutic Recreation Journal*, **4th Quarter**, 61-71.

Sachs, M.L. (1988, Spring). Sport psychology's neglected population: Persons with disabilities. *AAASP Newsletter*, 8-9.

Sherrill, C. (1993a). *Adapted physical activity, recreation, and sport: Crossdisciplinary and lifespan*. Madison, WI: Brown & Benchmark.

Sherrill, C. (1993b). Women with disability, Paralympics, and reasoned action contact theory. *Women in Sport and Physical Activity Journal*, **2**, 51-60.

Sherrill, C., & Rainbolt, W. (1988). Self-actualization profiles of male able-bodied and elite cerebral palsied athletes. *Adapted Physical Activity Quarterly*, **5**, 108-119.

Sherrill, C., Hinson, M., Gench, B., Kennedy, S.O., & Low, L. (1990). Self-concepts of disabled youth athletes. *Perceptual and Motor Skills*, **70**, 1093-1098.

Tabachnick, B., & Fidell, L. (1989). *Using multivariate statistics*, New York: Harper & Row.

Werthner, P., & Orlick, T. (1986). Retirement experiences of successful Olympic athletes. *International Journal of Sport Psychology*, **17**, 337-363.