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1 Running Head: SEX ROLE AND SPORT ATTRITION

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3 Understanding female sport attrition in a stereotypical male sport within the framework of Eccles'
4 expectancy-value model.

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1 Abstract

2 An empirical research study based upon the expectancy-value model of Eccles and colleagues
3 (1983) investigated the effect of gender role orientations on psychological dimensions of female
4 athletes' sport participation and the likelihood of their continued participation in a stereotypical
5 masculine activity. The model (Eccles et al., 1983) posits that gender role orientation is linked to
6 the intention to persist or discontinue sport participation which is later acted upon indirectly, as
7 mediated by two motivational variables: an individual's perceived competence and the perceived
8 value of the activity. Three models were compared to test this mediation hypothesis with 333
9 female adolescent handball players in a prospective study. Results from structural equation
10 modeling showed that a fully mediated model better fit the data and that: (1) the masculinity
11 orientation positively predicted value for and perceived competence in handball, whereas the
12 femininity orientation negatively predicted perceived competence; (2) the two motivational
13 variables negatively predicted intention to dropout. And finally such intentions are constituted the
14 more proximal predictors of actual dropout.

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16 Key words: dropout, sport, masculinity, femininity, motivation

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1 Understanding female sport attrition in a stereotypical male sport within the framework of Eccles'
2 expectancy-value model.

3 In France as in many Western countries, more and more females are regularly involved in
4 sport and physical activity. Between 1971 and 2000, the total level of female sport involvement
5 increased by a factor of 3.27, and in the year 2000, 55% of females reported that they practiced
6 physical activity at least one time per week in comparison to 65% of men (Ministry of Youth and
7 Sports, 2001). Nevertheless, there is great diversity in the nature of sport involvement between
8 males and females. For example, females are more likely to practice sport activities outside of
9 traditional or organized structures (only 33% are affiliated with a sports union), and are three
10 times less numerous than men in competitive sport activities.

11 In the same way that differential levels of involvement in sport seem to occur in relation to
12 sex, different patterns of sport dropout also seem to be evident. Females appear to withdraw from
13 the sport role more frequently than do males, particularly during adolescence (Russel, Allen, &
14 Wilson, 1996; Sallis & Patrick, 1996; Wankel & Mummery, 1996). For example, in the case of
15 French female handball players, there is a dropout rate of approximately 50% (against 35% for
16 males) between the ages of 13 and 15 years (Sarrazin & Guillet, 2001).

17 Given the numerous psychological, social, and physical benefits that accrue from the
18 regular practice of physical activity and sport (see Martinsen & Stephens, 1994, for a review), it is
19 unfortunate that a large number of children and teenagers terminate their participation in this
20 domain during adolescence. Moreover, some experts have identified adolescents as a group "at
21 risk" due to declining physical activity and subsequent health-related outcomes (Sallis & Patrick,
22 1996). If we desire to increase the physical activity level of the teenage population, more research
23 is needed with regard to factors related to their physical activity involvement.

1 *The gender role socialization explanation*

2 In general, each culture directs and encourages some behaviors, features and activities
3 considered as characteristics suitable for each sex (Cross & Madson, 1997) and gender roles
4 reflect consensual beliefs about the attributes of women and men. Consequently, many social
5 activities are sex-typed (e.g., Maccoby, 1990), and sport doesn't make exception to this gender
6 marking. Each sport conveys certain attributes of masculinity and femininity according to cultural
7 stereotypes. In relation to gender appropriateness, research has supported the idea that certain
8 sports are more commonly considered to be masculine or feminine in nature (e.g., Czisma, Wittig,
9 & Schurr, 1988; Ignico, 1989; Koivula, 1995, 1999; Matteo, 1986, 1988; Salminen, 1990).
10 Characteristics of male sex-typed sports include the use of heavy objects, bodily contact, face-to-
11 face opposition, and endurance. On the other hand, sports that typically place an emphasis on
12 aesthetics or gracefulness have been viewed as female sex-typed sports (e.g., Ignico, 1989; Kane,
13 1988; Metheny, 1965). In the same vein, Colley, Roberts, and Chipps (1985) found that the
14 majority of team sports are commonly considered inappropriate for females because they are more
15 frequently perceived to contain more masculine attributes such as assertiveness and aggressiveness
16 in comparison to individual sports. For example, team handball is an activity considered to have
17 more masculine characteristics whereas gymnastics fits more strongly with stereotypes of
18 femininity (Fontayne, Sarrazin, & Famose, 2001; Koivula, 1995, 1999).

19 When sports are gender stereotyped, females participating in "gender inappropriate" sports
20 have been found to experience more conflict between their roles as women and as athletes than do
21 female participants in more gender appropriate sports (e.g., Anthrop & Allison, 1983; Sage &
22 Loudermilk, 1979). This conflict could become particularly salient during the period of adolescent
23 socialization because the female child begins the transition toward womanhood (Brown, 1985).

1 Researchers have suggested that early adolescence is a time when gender role stereotypes and
2 expectations are likely to become particularly influential (e.g., Eccles & Bryan, 1994; Hill &
3 Lynch, 1983). Hill and Lynch (1983) labeled this phenomenon *gender-role intensification* which
4 is accompanied by an increase in the pressure to conform to social stereotypes. Indeed, being
5 pretty and looking feminine can be in conflict with the regular practice of a sport, in particular if
6 the sport is regarded as more appropriate for males (Duncan, 1995; Thorne, 1993). As a
7 consequence of this gender role conflict, and in order to avoid compromising their femininity,
8 some girls may drop out of sports and physical activity (Kane & Snyder, 1989; Young, 1990).

9 *Differences related to gender role orientations*

10 As there are individual differences in the tendency to use gender-related information (Bem,
11 1993), one might expect differences between individuals in sport participation and withdrawal
12 patterns depending on their gender role orientation. Indeed, the theoretical proposition advanced
13 by Bem suggests that individuals can be identified as gender-typed or non-gender-typed according
14 to attributes that are regarded as constitutive or not of their self-system. Generally, these are
15 characteristics that pertain to *communal* and *agentic* attributes (e.g., Eagly, 1987; Eagly, Wood,
16 & Diekmann, 2000). Communal characteristics primarily refer to a concern for the welfare of other
17 people (Eagly et al., 2000). These qualities tend to be ascribed more frequently to women. In
18 contrast, agentic characteristics primarily describe assertive, controlling, and confident tendencies
19 (Eagly et al., 2000). These characteristics are more frequently ascribed to men.

20 Although other types of attributes or behaviors are also differentially ascribed to women
21 and men (e.g., Athenstaedt, 2003; Deaux & Lewis, 1984), it is very often these communal and
22 agentic attributes that characterize the masculinity and the femininity dimensions, and which are
23 measured in the self-report instruments intended to assess gender role orientation (e.g., BSRI:

1 Bem, 1974; PAQ (Spence Helmreich, & Stapp, 1974). With these tools each respondent receives
2 a Masculinity/Instrumentality (or agentic) and a Femininity/Expressivity (or communal) score,
3 whatever his/her biological sex (see Blanchard-Fields, Suhrer-Roussel, & Hertzog, 1994; Marsh &
4 Myers, 1986, for reviews). Those who score high on the sex-congruent scale and low on the sex-
5 incongruent scale are considered gender-typed. Those who show the opposite pattern are
6 considered cross-gender-typed. Those who score high on both scales are considered androgynous
7 while those who score low on both scales are considered undifferentiated. Those individuals low
8 on both are considered to be non-gender typed.

9 According to gender role theory, gender-typed individuals differ from non-gender-typed
10 individuals in their use of gender as a dimension to encode and organize information even when
11 other more relevant dimensions are equally available. Gender-typed individuals are motivated to
12 avoid behaviors that violate these images and to choose behaviors that conform to cultural norms
13 for masculinity and femininity (Bem, 1981). In the sport domain, several studies have provided
14 support for the theory, indicating that (1) female athletes and sport participants are more likely to
15 be higher in masculinity orientation than are female nonparticipants and dropout athletes (e.g.,
16 Colley, Roberts, & Chipps, 1985; Engel, 1994; Guillet, Sarrazin, & Fontayne, 2000; Marsh &
17 Jackson, 1986; Matteo, 1986; Salminen, 1990; see Gill, 1992, for a review); (2) gender-typed
18 individuals are more likely than others to categorize sports as appropriate or inappropriate on a
19 gender basis and to restrict their participation to what they perceive as gender appropriate sport
20 and exercise activities (e.g., Colley, Nash, O'Donnel, & Restorick, 1987; Koivula, 1995; Mead &
21 Ignico, 1992); and (3) gender-typed individuals cite more gender-based explanations and related
22 gender-based reasons as important to their decisions for rejecting sex-inappropriate activities than
23 do non-gender-typed people (Matteo, 1988).

1 Theoreticians have also proposed the existence of certain motivational processes
2 associated with gender role orientations and achievement behaviors. For example, Eccles and her
3 colleagues (e.g., Eccles, Adler, Futterman, Goff, et al., 1983; Eccles, Wigfield, & Shiefele, 1998;
4 Wigfield & Eccles, 2000) have developed an expectancy-value framework that incorporates
5 gender role stereotypes along with achievement cognitions in order to explain people's choice of
6 achievement tasks and persistence or dropout on those tasks. According to Eccles' model, the two
7 important predictors of choice behaviors are individuals' expectations for success and the
8 subjective task value that they associate with the domain or activity (see Eccles et al., 1983). In
9 her model, expectations refer specifically to individuals' level of expectancy about attaining
10 success in a particular domain. Research studies (e.g., Eccles, 1994; Eccles & Wigfield, 1995)
11 have shown that expectations closely correspond to self-conceptions of ability (i.e., competence
12 beliefs). On the other hand, Eccles and her colleagues (e.g., Eccles et al., 1983, 1998; Wigfield &
13 Eccles, 2000) have defined subjective task value in terms of four components: (1) intrinsic value
14 (enjoyment of the activity); (2) utility value (usefulness of the task in terms of current and future
15 goals); (3) attainment value (personal importance of doing well at the task); and (4) costs
16 (perceived negative aspects of engaging in the task). Empirical studies have focused on the first
17 three of these characteristics.

18 Previous studies have shown that both task value and expectations predict current and
19 future activity choice across a variety of domains including taking math classes, engaging in sport
20 activities, and choosing a college major (see Eccles et al., 1998, for a review). Gender differences
21 in competence beliefs and task values have been found with females usually reporting lower
22 competence beliefs and task values than do males in sport (e.g., Fredricks & Eccles, 2002;
23 Wigfield, Harold, Freedman-Doan, Eccles, et al., 1997). Nevertheless, no study to our knowledge

1 has endeavored to examine the relationships among gender-role orientation and expectancy/value
2 components of the model in the sport domain

3 *The present study*

4 The purpose of this study was to apply Eccles and colleagues' expectancy-value model to
5 the explanation of sport dropout among girls. A particular emphasis of the research was on the
6 application of this model with a European sample that has not been well represented in the
7 socialization literature to date. The main hypothesis of this study was that gender role orientations
8 would predict girls' intention to dropout and their dropout behavior indirectly, as mediated by the
9 motivational variables hypothesized by Eccles and her colleagues (e.g., Eccles et al., 1983, 1998;
10 Wigfield & Eccles, 2000).

11 To test the mediation hypothesis, three models were compared (see Figure 1) in order to
12 thoroughly examine the three requirements for mediation as defined by Baron and Kenny (1986)
13 that we could summarize as follows: (a) variations in levels of the independent variable account
14 for significant variations in the presumed mediator (i.e., path *a*), (b) variations in the mediator
15 account for significant variations in the dependent variable (i. e., path *b*), and (c) when Paths *a* and
16 *b* are controlled, a previously significant relation between the independent and dependent variables
17 (i.e., path *c*) is no longer significant.

18 The first model reflected by Figure 1 represents an unmediated (NM) model. It allows us
19 to test if individuals' intention to dropout of their activity is directly predicted by their gender role
20 orientation (i.e., if path *C* is significant). Indeed, in accordance with the postulates of social
21 cognitive approaches (see Ashmore & Sewell, 1998) and previous studies (e.g., Colley et al.,
22 1985; Engel, 1994; Guillet et al., 2000; Marsh & Jackson, 1986; Matteo, 1986; Salminen, 1990),
23 females high in femininity would be anticipated to be more likely to decide to discontinue a

1 stereotypically masculine sport such as handball in order to maintain a feminine self-image in
2 relation to prevailing cultural norms of femininity. In contrast, females high in masculinity would
3 be anticipated to be more likely to decide to continue their practice of handball.

4 The second model represents a fully mediated (FM) model which allows for simultaneous
5 examination of the two first requirements for the mediation (see above). It is hypothesized that
6 girls' gender role orientations (the independent variables) are linked to both of the motivational
7 variables (the mediators) which, in turn, are related to players' intention to dropout (the dependent
8 variable). According to the Eccles et al. (1983) model, we anticipated that participants high in
9 femininity would perceive themselves to be less competent than those individuals high in
10 masculinity, in activities which are more commonly gender stereotyped as masculine, such as team
11 handball. On the other hand, if a particular achievement activity is not congruent with an
12 individual's gender role it is anticipated that the subjective task value of the activity would also be
13 low. In other words, females high in femininity should perceive less value in team handball
14 participation than those females high in masculinity because the activity is perceived to be less
15 consistent with their gender identity.

16 In sum, when girls are involved in team handball, a stereotypically masculine activity, we
17 hypothesized that (1) a high masculinity score should be more positively related to, and a high
18 femininity score should be more negatively related to, an individual's perceptions of competence in
19 team handball (Path A2) and the value that they perceive in engaging in this activity (Path A1); (2)
20 in turn, the less value the players ascribe to the activity and the less confident they feel in their
21 abilities, the stronger should be their intention to discontinue the activity (Paths B1 and B2,
22 respectively).

1 All players were regular participants in local and regional competitions and leagues. Participants
2 represented 56 sport clubs located in the southeast of France.

3 *Measures*

4 *Feminine and Masculine Role Orientation.* Players completed the French short version of
5 the Bem Sex Role Inventory (Fontayne, Sarrazin, & Famose, 2000). The Bem Sex Role Inventory
6 has been considered to be an appropriate means for the examination of gender-typed behaviors
7 because it does not adhere to previously popular bipolar views of masculinity and femininity but
8 rather considers these gender characteristics to be bidimensional in that individuals can be high or
9 low on each. Elaborated from the original Bem scale, this questionnaire measures only the features
10 that seem constitutive of the masculinity (M) and femininity (F) orientations of French teenagers
11 of today. Indeed, societal changes have contributed to variations in the attributes that are currently
12 considered to be characteristic of M and F. Auster and Ohm (2000) observed, for example, that
13 feminine traits of greater current importance seem more reflective of sensitivity and compassion
14 rather the dependency or subservience focus of years past.

15 The tool is an 18-item questionnaire hierarchically ordered to assess gender role
16 orientation in terms of two higher order factors, labeled F and M, and five lower order factors,
17 two assessing the F dimension, and three assessing the M dimension. F dimensions consist of items
18 reflecting tenderness (5 items, e.g., “I am affectionate”), and sensitivity to others (5 items, e.g., “I
19 am always ready to listen to others”). M dimensions consist of items reflecting assertiveness (3
20 items, e.g., “I am forceful”), leadership (3 items, e.g., “I act as a leader”), and self-confidence (2
21 items, e.g., “I am self-confident”). Ratings were made on a 7-point Likert scale, ranging from 1
22 (*never true*) to 7 (*always true*). In this study, the scales demonstrated acceptable Cronbach alpha
23 reliability coefficients of .85 and .76 for F and M scales, respectively.

1 Although the BSRI has often been used to classify participants into various gender role
2 categories (e.g., “androgynous” or “undifferentiated”) via methods such as median splits
3 performed on subscale scores, this approach is inherently weak, throwing away much systematic
4 variance in the M and F responses, and has been broadly criticized (e.g., Marsh & Byrne, 1991).
5 Consequently, following the recommendations of several authors (e.g., Marsh & Byrne, 1991) M
6 and F scales were treated as continuous variables (i.e., participants received an overall score and
7 were not classified into specific group) in the current investigation.

8 *Subjective activity value.* The participants completed the French version of the scale of
9 subjective activity value (Sarrazin, Guillet, & Fontayne, 1999). This scale was translated from the
10 activity value scale of Eccles et al. (1983). It contains four items which assess perceived utility
11 value (e.g., “I think I will be able to use what I learn in handball in other domains of my life”), two
12 items that assess perceived attainment value (e.g., “It’s important for me to perform at a good level
13 in handball”), and four items that assess the intrinsic value of the activity (e.g., “I find the game
14 very exciting”). Previous research (Sarrazin et al., 1999) has indicated the presence of the three
15 hypothesized factors, and a second-order factor analysis revealed that the three factors are
16 correlated and comprise a single factor. In this study, this scale possessed adequate internal
17 consistency (Cronbach $\alpha = .81$).

18 *Competence beliefs.* Competence beliefs are defined as the player’s perception of her
19 current competence at the target activity, in this case team handball competence (Eccles et al.,
20 1983; Wigfield & Eccles, 2000). Four items were included on the scale (e.g., “I feel that I am
21 better than my teammates”). Responses to these different items were rated on a 7-point Likert
22 scale ranging from 1 (*not all in agreement*) to 7 (*completely in agreement*). This scale had a
23 Cronbach alpha level of internal consistency of .81.

1 *Behavioral Intention.* The participants answered five questions (based on the work of
2 Ajzen & Driver, 1992), which assessed their future intention regarding their perceptions of their
3 likelihood to discontinue handball participation, on a scale ranging from (1) not at all to (7)
4 definitely, (e.g., “Are you determined to continue handball?”). This scale used reverse scoring in
5 certain instances (e.g., “Have you seriously planned to stop handball participation yet”). In this
6 study, internal consistency proved to be satisfactory (Cronbach $\alpha = .87$).

7 *Procedure*

8 Toward the middle of one team handball season, the participants received the questionnaire
9 by mail with a stamped return envelope. An accompanying letter explained the purpose of the
10 study, and it was clearly stated to participants that anonymity and confidentiality of their answers
11 would prevail at all times. Eight months later, at the beginning of the following season, we
12 contacted the French Federation of Handball to establish a list of female handball players who did
13 not re-enroll in any handball club. Through these procedures a total of 74 dropout players and 259
14 persistent players were identified.

15 Results

16 *Data Analysis*

17 Two main types of analyses were conducted. The first type was a multivariate
18 analysis of variance (MANOVA), which assessed the differences between the persistent and
19 dropout players on the set of measured variables. The second analysis involved structural
20 equation modeling (LISREL 8.30, Jöreskog & Sörbom, 1996) in order to test the relationships
21 among the variables as hypothesized in the three models of Figure 1.

22 To investigate the issue of mediation, the requirements advocated by Baron and Kenny
23 (1986) were carefully examined (see above). Moreover, a chi-square difference test between the

1 PM and an FM models was carried out to see whether the global fit was improved by including
2 path C (i.e., the path between gender role orientation and intention). The PM and FM models
3 were directly compared (see Tabachnick & Fidell, 2001).

4 *Descriptive statistics and preliminary analyses*

5 Means and standard deviations for the players who persisted and those who discontinued
6 participation are presented in Table 1. A MANOVA was conducted with type of player (dropout
7 vs. persistor) as the independent variable and subjective activity value, perceived competence,
8 femininity and masculinity orientations and intention to dropout as dependent variables. Results
9 revealed a significant effect for type of player, Wilks' lambda = .75, Rao's $R(5, 327) = 21.07, p <$
10 $.0001$. Follow-up univariate analysis (see Table 1) revealed a player by type main effect for
11 subjective activity value, $F(1, 331) = 21.19, p < .001$, perceived competence, $F(1, 331) = 6.48, p$
12 $= .01$, and intention to dropout, $F(1, 331) = 100.1, p < .001$. The persistent players reported
13 higher subjective handball value and perceived competence, and lower intention to withdraw than
14 those who dropped out. A main effect was also found for type of player in relation to the
15 masculinity dimension, $F(1, 331) = 5.30, p = .02$. In this regard, the persistent players had higher
16 masculinity scores than did the dropout players. Finally, as shown in Table 1, there was no
17 significant player main effect for femininity scores ($p > .05$).

18 *Comparison of Structural Models*

19 The hypothesized relationships among the six variables were estimated and the three
20 proposed models (see Figure 1) were tested using structural equation modeling. In light of the
21 already large number of variables in the model, we decided to reduce it to keep the degrees of
22 freedom of the model reasonable. In this regard, several item parcels, rather than all of the items
23 on each construct were used (e.g., Bagozzi & Heatherton, 1994; West, Finch, & Curran, 1995).

1 For constructs with several subscales (masculinity, femininity, and value) the score for each
2 subscale was used as the manifest indicator of the underlying construct. For perceived competence
3 and intention to dropout variables, the items from each construct were randomly aggregated into
4 two parcels. For instance, the four items of perceived competence were grouped into two 2-item
5 averaged scores via random splitting of the scales. Ultimately, the models (see Figure 2) included
6 12 manifest indicators constituting five latent variables: Femininity, Masculinity, subjective
7 handball value, perceived competence, intention to dropout, and one observed variable
8 representing actual dropout behavior (0= persistent, 1= dropped out)¹.

9 Consistent with standard LISREL notation, observed variables are presented as rectangles,
10 whereas latent variables are presented as circles. Because the variables were highly non-normal
11 (tests of zero multivariate skewness = 8.64, $p < .0001$ and zero multivariate kurtosis = 2.46, $p < .$
12 0001), PRELIS 2 (Jöreskog & Sörbom, 1993), a preprocessor of LISREL, was used to generate
13 the polychoric correlation and its corresponding asymptotic covariance matrix (Jöreskog, 1990).
14 Both matrices were used as input for the LISREL 8 program (Jöreskog & Sörbom, 1996) and
15 analyzed by the Generally Weighted Least Squares (WLS) method of estimate (Jöreskog, 1990;
16 Jöreskog & Sörbom, 1996)².

17 The following fit indices (Bollen, 1989; Hoyle & Panter, 1995) were used to evaluate the
18 adequacy of the proposed model: chi-square statistic (χ^2), goodness of fit (*GFI*; Jöreskog &
19 Sörbom, 1996), comparative fit index (*CFI*; Bentler, 1990), normed fit index (*NFI*; Bentler &
20 Bonett, 1980), and root mean square residual (*RMSR*; Jöreskog & Sörbom, 1996). For *GFI*, *NFI*
21 and *CFI* values above .90 are considered satisfactory. For *RMSR*, values below .10 indicate a
22 good fit of the model to the data.

1 With the exception of chi-square complicated by sample size: $\chi^2(57, N = 333) = 146.98, p$
 2 $< .001$, other goodness-of-fit indices revealed that the NM model presented an adequate fit to the
 3 data: $GFI = .98, NFI = .97, CFI = .98, RMSR = .10$. Masculinity ($\gamma = -.85, p < .001$) and
 4 Femininity ($\gamma = .30, p < .01$) significantly predicted girls' intention to dropout and accounted for 50
 5 percent of its variance.

6 The FM model presented a better fit to the data, $\chi^2(58, N = 333) = 141.46, p < .001, GFI$
 7 $= .98, NFI = .97, CFI = .99, RMSR = .08$. Structural, measurement coefficients, explained
 8 variance for each constructs, and residual variance for each observed variable are displayed in
 9 Figure 2. The results revealed that masculinity orientation had a positive influence on perceived
 10 competence ($\gamma = .98, p < .001$) and subjective handball value ($\gamma = .85, p < .001$). On the other hand,
 11 femininity orientation was negatively related to perceived competence ($\gamma = -.44, p = .029$) but not
 12 with the value of the activity ($\gamma = -.13, p = .31$)³. In turn, the lower the perceived competence and
 13 value, the higher was the future intention to dropout of handball ($\beta = -.10, p = .05$ and $\beta = -.74, p$
 14 $< .001$, respectively). Finally, these intention was directly linked to dropout behavior ($\lambda = .70, p <$
 15 $.001$). This model accounted for 62 percent of the variance of girls' intention to dropout.

16 The PM model presented an adequate fit to the data: $\chi^2(56, N = 333) = 136.84, p < .001,$
 17 $GFI = .98, NFI = .97, CFI = .99, RMSR = .08$. Nevertheless, girls' gender role orientation did not
 18 predict dropout intention (Path C; $\gamma = .40, p = .10$ and $\gamma = .07, p = .45$, respectively for
 19 Masculinity and Femininity). The comparison between the PM and FM models suggested that the
 20 addition of Path C did not significantly improve the fit [$\Delta\chi^2(2) = 4.60, p = .10$], hence the simplest
 21 model (i.e., the FM model) should be preferred.

1 Inspection of the relevant parameters indicated that the three criteria for mediation listed
2 by Baron and Kenny (1986) were fully achieved: (1) Masculinity predicted subjective value and
3 perceived competence (i.e., Paths A1 and A2) and Femininity predicted perceived competence
4 (i.e., Path A2); (2) subjective value and perceived competence were linked to the intention to
5 dropout (i.e., Paths B1 and B2); and (3) the direct paths (i.e., C) from Femininity and Masculinity
6 to intention to dropout were nonsignificant when Paths A and B were controlled for ($ps \geq .10$, in
7 the PM model), whereas these paths were significant ($p < .01$) when the Paths A and B were
8 removed (in the NM model)..

9 Ancillary analyses were carried out to test the possibility that perceived competence and
10 subjective value and/or masculinity and femininity directly predicted the actual dropout behavior.
11 The results showed that none of these paths were significant. In other words, and in line with
12 other previous researches (e.g., Ajzen & Driver, 1992; Sarrazin et al., 2002), intention constituted
13 the key proximal predictor of behavior in this study.

14

15 Discussion

16 Sport involvement clearly has a positive and pervasive influence on numerous life domains,
17 including physical health, psychological well-being, and self-esteem (Martinsen & Stephens,
18 1994). Consequently, it is important to attempt to maximize the opportunities to practice sport
19 activities for children, adolescents, and adults. At the same time, adolescents, especially females,
20 have been identified as a special social group at risk for compromised health due to their declining
21 level of physical activity during adolescence (Gould, 1987; Russel et al., 1996; Sallis & Patrick,
22 1996; Wankel & Mummery, 1996).

1 The aim of this study was to test a model grounded in the Eccles' et al. (1983) expectancy-
2 value framework, which proposed to examine the influence of various motivational variables and
3 gender role orientation characteristics in order to explain the attrition phenomenon in a
4 stereotypically male sport practice like team handball. This model posits that gender role
5 orientations are linked to perceived competence in handball and the perceived value of this
6 activity, which, in turn, are related to behavioral intention, a proximal predictor of dropout
7 behavior. Results from this prospective study provided some support for this hypothesized
8 framework. First of all we will discuss the links between gender role orientations and dropout
9 from a stereotypically masculine activity and then focus on the mediating role of the motivational
10 variables in the model.

11 *Gender role orientation effects*

12 Many social activities are sex-typed (Maccoby, 1990) and sport doesn't make exception to this
13 sexual marking. Adherence to one's gender role may be so central to an individual that merely
14 knowing, even at subconscious level, that a particular activity is stereotypically gender marked
15 may be sufficient to prevent further consideration of participation in that activity (Eccles &
16 Harold, 1991). As a consequence, it was hypothesized that adolescent girls with a high femininity
17 level would be inclined to dropout of a stereotypically masculine sport. In contrast, adolescent
18 females with a high masculinity score would be anticipated to be more inclined to practice this sort
19 of sport for a longer period of time, because it was more consistent with their gender role. The
20 findings partially conform with these hypotheses because the players who continued their handball
21 participation the following season were higher on masculinity orientation than the ones who
22 dropped out. This result is congruent with other studies that have found female athletes to have
23 higher masculinity orientations than nonparticipants, particularly in team sports (Colley et al.,

1 1985; Colley et al., 1987; Gill, 1992; Guillet et al., 2000). Nevertheless, femininity was not related
2 to dropout.

3 *The motivational mediators of the model*

4 The model we tested posited that gender role orientation is linked to the intention to
5 discontinue sport participation indirectly, as mediated by two motivational variables hypothesized
6 by Eccles and her colleagues (e.g., 1983): an individual's perceived competence and the value that
7 they assign to an activity. Three SEM models were tested in order to carefully examine the
8 requirements for the mediation effect proposed by Baron and Kenny (1986). The results support
9 the mediational influence of the motivational variables. First, the SEM results of the FM model
10 showed the positive and important influence of masculinity on the individual's subjective activity
11 value and perceived competence in that individuals with a stronger masculinity orientation ascribed
12 higher subjective value to handball participation and perceived themselves to be more competent
13 in this activity. On the other hand, SEM revealed that femininity was negatively related to
14 perceived competence. In this respect, players with a stronger female role orientation reported
15 lower perceived competence. But, in contrast with our assumptions, the relation between
16 femininity and subjective value was not significant. A first explanation for the finding is that the
17 social cost of being a woman handballer, to whatever extent this may have been an issue in the
18 past, is declining. It is possible that the good results of the French female team of handball since
19 the beginning of 2000 (first in the World Championships and qualification for the Olympic Games)
20 have modified the gender typing of this sport, in particular because of greater media coverage.
21 Additional studies are necessary to test this hypothesis.

22 It is also possible to explain this result using Marsh's (1987; Marsh & Byrne, 1991)
23 differentiated additive androgyny model of self-concept-Masculinity/Femininity relations. This

1 author has proposed that the relation of masculinity and femininity to several variables such as
2 self-concept depends on the aspect of the variable that is being measured. Support for this model
3 was found in Marsh and Byrne's (1991) study, in which the positive contribution of masculinity
4 was greater in those areas in which men had higher self-concept responses (e.g., perceptions of
5 athletic abilities), and the contribution of femininity was more positive in the areas of self-concept
6 in which women had higher self-concept responses (e.g., perceptions of relations with parents).

7 The results of our study fit with the differentiated additive androgyny model. They showed
8 that the contribution of masculinity was greater than femininity in predicting the subjective value,
9 perceived competence and persistence in a stereotypical male activity. In accordance with this
10 model, femininity had only a very limited impact in the prediction of these same variables, insofar
11 as it proved to be moderately negatively related to perceived competence, and was not correlated
12 at all with value. Stronger support for the differentiated additive androgyny model applied to sport
13 dropout would necessitate evidence that the contribution of femininity is more important than
14 masculinity in predicting subjective value, perceived competence and persistence in a stereotypical
15 female activity, particularly with a male sample. It would be worthwhile to conduct such a study in
16 the future.

17 Secondly, the results revealed that higher perceptions of value, and to a lesser extent
18 higher perceptions of competence, were negatively associated with athletes' intention to dropout.
19 These findings are consistent with Eccles' predictions (see Eccles et al. 1983; Wigfield & Eccles,
20 1992; Wigfield & Eccles, 2000), which presume that perceived competence and activity value are
21 critical determinants of motivated behavior in achievement contexts. These authors have found
22 that high subjective activity value and perceived competence influence perseverance in a physical
23 activity (see also Eccles & Harold, 1991).

1 Thirdly, the comparison between a fully mediated and a partially mediated model shows
2 that the mediation of motivational variables is complete, insofar as the direct paths between gender
3 role orientations and intention to dropout were nonsignificant when the paths between
4 motivational variables to intention were controlled for. Finally, our results suggest that intention to
5 discontinue an activity represents the key proximal predictor of dropout behavior which is
6 consistent with some previous research (e.g., Ajzen & Driver, 1992; Sarrazin et al., 2002)

7 This study highlights the influence of motivational variables, particularly perceived
8 competence and subjective value, on dropout intention. The more value the players ascribed to the
9 activity and the higher their levels of competence, the lower were their intentions to discontinue
10 practice of the sport. This study similarly suggested that gender role orientation had only a distal
11 influence on actual dropout behavior through the influence of motivational variables in that players
12 high in masculinity tended to perceive themselves as more competent and tended to more highly
13 value the activity. Moreover, femininity orientation was negatively related to perceived
14 competence in that the more the players had a stronger femininity orientation, the less they
15 perceived themselves to be competent in the activity. Ultimately, the results of this study showed
16 that the masculine gender orientation was particularly related to the handball withdrawal process
17 among girls, with players low in masculinity more vulnerable to dropout from this activity. By
18 contrast, the femininity orientation seems less strongly related to such an outcome. These findings
19 are consistent with some previous studies (e.g., Marsh & Jackson, 1986), which indicated that
20 female competitive athletes are substantially higher in masculinity than are female nonathletes,
21 whereas the two groups do not differ in terms of femininity.

22 Although the present results provided support for the proposed model, some limitations should be
23 highlighted when interpreting these findings. First of all, as with all path analytic studies, these

1 results must be interpreted cautiously, because it is always possible that a relevant variable was
2 omitted (see, e.g., Judd & McClelland, 1989). Secondly, this study was limited to adolescent girls
3 playing a stereotypically masculine activity. The extent to which these results generalize to
4 adolescent girls participating in a stereotypical feminine activity or to adolescent males playing a
5 stereotypical masculine or feminine activity are unknown and should be explored. Thirdly, Eccles
6 and her colleagues (Eccles et al., 1983; Eccles et al., 1990; Wigfield & Eccles, 1992) have shown
7 that beliefs and behaviors of significant others have an important influence on children's
8 perceptions. A broader approach which would take into account the influence of other social
9 agents (e.g., parents, coach, and peers) as well as media, on youngsters' beliefs would be
10 beneficial as this would allow for a greater depth of understanding to the nature of gender role
11 socialization as such socialization processes may affect motivation and continued sport
12 involvement.

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Footnotes

¹ Dichotomous variables require special handling in SEM. Following the Jöreskog and Sörbom (1993) guidelines, we have specified in the PRELIS software that the dropout variable was a categorical variable. The categories of this variable were then converted in thresholds of the underlying (latent), normally distributed, continuous variable. SEM carried out by LISREL proceeds by using polyserial correlations rather than covariance procedures as the basis of the analysis so as to not violate the basic assumptions of SEM when a variable is not continuous.

² WLS does not assume multivariate normality. However, it does require analysis of an asymptotic covariance matrix of the elements in the variance-covariance matrix, and the asymptotic covariance matrix requires a large sample to get stable estimates. Jöreskog and Sörbom (1993) defined the minimum sample size required for estimating asymptotic covariance matrix as $k(k-1)/2$ cases where k is the number of variables. In this study, the Jöreskog and Sörbom's criteria of sample size was met ($k = 13$). This covariance matrix is available from the first author.

³ Additional analyses were also carried out to test if there was an interaction between masculine and feminine gender role orientations to predict both perceived competence and subjective activity value. To investigate this possibility, we performed hierarchical multiple regression analyses in which either perceived competence or subjective value was predicted from masculinity and femininity orientations (step 1) and then from the interaction terms between the two (step 2). Following Aiken and West's (1991) guidelines for testing interactions, the independent variables were centered. The interactions did not attain significance either for subjective value [$F(1, 332)=0.19, p>.66, \beta=.02$], or for perceived competence [$F(1, 332)=0.60, p>.44, \beta=.04$].

Table 1

Means (M) and standard deviations (SD) of dropout and persistent players on the different subscales.

Subscales	Persistent players (<i>n</i> =259)		Dropout players (<i>n</i> =74)		<i>F</i> (1, 331) <i>p</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Femininity	5.44	0.85	5.49	0.91	.65
Masculinity	4.55	0.89	4.27	0.99	.02
Subjective Activity Value	5.52	0.82	5.00	0.95	<.001
Perceived Competence	3.59	1.35	3.14	1.35	.011
Intention to dropout	1.91	1.14	3.63	1.75	<.001

Note: Means differ significantly at *p*-value listed.

Figure caption

Figure 1. Series of tested models. From top to bottom: non-mediated model (NM), fully mediated model (FM), and partially mediated model (PM).

Figure 2. Structural equation model of the fully mediated model. Standardized solutions are presented. * $p < .05$ ** $p < .001$



