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Extending the 3×2 achievement goal model to the sport domain: The 3×2 Achievement Goal Questionnaire for Sport



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ABSTRACT

In the present research, we sought to extend the 3×2 achievement goal model recently proffered in the school domain to the sport domain. We did so by conducting two studies focused on the development and initial validation of the 3×2 Achievement Goal Questionnaire for Sport (3×2 AGQ-S). Study 1 ($n = 679$), devised items for the questionnaire and demonstrated that data from the questionnaire nicely fit the proposed 3×2 model, showed a better fit to the 3×2 model than to alternative models, and indicated that each goal variable had good internal consistency. Study 2 again documented the strong psychometric properties of the measure, and additionally linked the goal variables to other constructs central to the achievement goal literature. The establishment of this measure allows extensive study of the 3×2 achievement goal model in the sport domain, and promises to yield deeper insights into the nature of achievement motivation in such contexts.

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Competence has long been viewed as a basic motivator of human behavior (McClelland, Atkinson, Clark, & Lowell, 1953; Murray, 1938; White, 1959). Individuals strive to do well or strive to avoid doing poorly in situations where their competence is evaluated, such as school, sport, and work. Over the past 30 + years, achievement goals have been an important focus of research on competence-based motivation. The literature on achievement goals has typically progressed in the following way: theorists posit a conceptual model, researchers develop a measure to assess the model, and then other researchers utilize the measure to conduct empirical work. An achievement goal measure is usually developed in one domain (e.g., school), and then adapted for use in another domain (e.g., sport) once the validity and utility of both the model and the measure have shown promise. This process has produced a voluminous body of research on achievement goals that has broadened and deepened our understanding of achievement motivation and behavior (for reviews, see Deshon & Gillespie, 2005; Elliot, 2005; Harwood, Spray, & Keegan, 2008; Hulleman, Schragar, Bodmann, & Harackiewicz, 2010; Kaplan & Maehr, 2007; Lochbaum & Gottardy, in press; Roberts, Treasure, & Conroy, 2007; Van Yperen, Blaga, & Postmes, 2014).

The present research fits nicely into this tradition. In the present research, we focus on the recently proffered 3×2 model of achievement goals, with the aim of applying this model to the sport domain and developing a measure of achievement goals for sport. Before we introduce the specifics of the present research, we provide an overview of the emergence of various achievement goal models to establish a historical context for our work.

Initial conceptual work on achievement goals emerged in the late 1970s and early 1980s, and distinguished between two different goal constructs: mastery goals and performance goals (Dweck & Elliott, 1983; Maehr & Nicholls, 1980; Nicholls, 1984; see Ames, 1992, for an overview of the different labels used for these goals). Mastery goals were construed in terms of striving to develop competence through task mastery and improvement, whereas performance goals were construed in terms of striving to demonstrate competence relative to others. This is commonly referred to as the dichotomous model of achievement goals. Initial measures of these achievement goals focused on school settings (Meece, Blumenfeld, & Hoyle, 1988; Nicholls, Pataschnik, & Nolen, 1985; Nolen, 1988); measures focused on sport settings¹ emerged a few years later (Duda, 1989; Roberts & Balague, 1989; see also Duda &

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¹ Here and throughout, we use the term “sport” broadly to encompass both physical activity in sport contexts per se and physical activity in exercise and physical education contexts.

Nicholls, 1992; Roberts, Treasure, & Balague, 1998). These sport measures generated a large body of empirical research (for reviews, see Biddle, Wang, Kavussanu, & Spray, 2003; Duda, 2005; Ntoumanis & Biddle, 1999) that helped establish the prominence of the achievement goal approach to achievement motivation.

In the mid 1990s, Elliot and Harackiewicz (1996) proposed that the performance goal construct of the dichotomous model be bifurcated with respect to the theoretically rich, historically-grounded approach-avoidance distinction. The result was the trichomous model of achievement goals, comprised of mastery goals (comparable to those from the dichotomous model), performance-approach goals (focused on doing well relative to others), and performance-avoidance goals (focused on not doing poorly relative to others). Several measures of these achievement goals emerged shortly thereafter in the school and work domains (Elliot & Church, 1997; Middleton & Midgley, 1997; Skaalvik, 1997; VandeWalle, 1997); sport versions were developed a few years later (Cury, Da Fonséca, Rufo, & Sarrazin, 2002; Halvari & Kjormo, 1999; see also Carr, 2006; Gernigon, d'Arripe-Longueville, Delignières, & Ninot, 2004; Ommundsen, 2004). These sport measures yielded empirical fruit to some degree (for reviews, see Elliot & Conroy, 2005; Harwood et al., 2008), but they were soon encompassed within the measures described next that included the three goals of the trichotomous model, but also a fourth goal.

A few years later, Elliot (1999) and Pintrich (2000) proposed that mastery-based goals, like performance-based goals, could be bifurcated with regard to the approach-avoidance distinction. This yielded a fourth goal construct, a mastery-avoidance goal, focused on not doing poorly relative to task demands or one's own performance trajectory. This goal allowed a full crossing of the definition (mastery/performance) and valence (positive/negative) components of competence, giving rise to the 2×2 achievement goal model. The initial measure of these achievement goals focused on school settings (Elliot & McGregor, 2001; see also Baranik, Barron, & Finney, 2007; Elliot & Murayama, 2008; Van Yperen, 2006); a measure focused on sport settings was developed shortly thereafter (Conroy, Elliot, & Hofer, 2003). This and related sport measures (Ferron, Le Bars, & Gernigon, 2005; Guan, McBride, & Xiang, 2007; Méndez-Giménez, Cecchini-Estrada, & Fernández-Rio, 2014; Riou et al., 2012; Schiano-Lomoriello, Cury, & Da Fonséca, 2005) have been used extensively in the sport psychology literature in many different countries across the globe and have yielded many insights into the nature of self-regulation in the sport domain (for reviews, see Harwood et al., 2008; Lochbaum & Gottardy, in press; Van Yperen et al., 2014).

Recently, Elliot, Murayama, and Pekrun (2011) extended the 2×2 achievement goal model to a 3×2 model by separating mastery-based goals into task-based and self-based categories. Task-based goals focus on how one is doing relative to the absolute demands of the task or activity (e.g., the degree to which one has or has not accomplished the activity), whereas self-based goals focus on how one is doing relative to one's own trajectory (e.g., the degree to which one is or is not improving). Performance-based goals are simply relabeled other-based goals in this model to more clearly link these goals to their standard used to define competence. Definition of competence (task/self/other) is then fully crossed with valence of competence (positive/negative) to produce the six goals of the 3×2 model: task-approach (focused on attaining task-based competence; e.g., doing the activity the way it was designed to be done, such as “make a lot of free throws” in basketball), task-avoidance (focused on avoiding task-based incompetence; e.g., not failing to do the activity the way it was designed to be done, such as “not miss a lot of free throws”), self-approach (focused on self-based competence; e.g., doing better than before, such as “make more free throws than I usually make”), self-avoidance

(focused on self-based incompetence; e.g., not doing worse than before, such as “not make fewer free throws than I usually make”), other-approach (focused on attaining other-based competence; e.g., doing better than others, such as “make more free throws than my teammates”), and other-avoidance (focused on avoiding other-based incompetence; e.g., not doing worse than others, such as “not make fewer free throws than my teammates”). The initial measure of these achievement goals was developed by Elliot et al. (2011) for a school context (see also Wu, 2012); a sport measure has yet to be developed.

The present research is comprised of two studies designed to facilitate extension of the 3×2 achievement goal model to the domain of sport. There are clear conceptual, empirical, and practical reasons to focus on the 3×2 achievement goal model in sport. *Conceptually*, the core distinction of the model – the differentiation of task-based and self-based standards – is of clear relevance to the sport domain, as individuals engaged in a sport activity or physical task may focus on whether they are (or are not) accomplishing the activity/task per se or they may focus on how they are doing relative to how they have done in the past or their future potential. This is the case for any and all activities/tasks in sport contexts, and attending to this distinction between task-based and self-based standards affords greater precision and rigor in describing and explaining the nature of competence-based pursuits in these contexts. *Empirically*, current measures of mastery-approach and mastery-avoidance goals in the sport domain vary in terms of whether they focus on task-based standards (e.g., Wang, Biddle, & Elliot, 2007), self-based standards (e.g., Conroy et al., 2003), or a combination of task-based and self-based standards (e.g., Riou et al., 2012). As such, it is difficult to know precisely how to interpret any given research finding, and when different empirical patterns are observed across studies, one ready explanation is that different measures carrying the same label are actually measuring different constructs (i.e., the jingle fallacy; Thorndike, 1904). For example, in the extant literature, mastery-approach goals assessed with task-based items seem to yield a positive pattern of relations somewhat more consistently than those assessed with self-approach items (cf. Schnatz & Conroy, 2009; Wang et al., 2007). Assessing these task-based and self-based constructs separately would afford greater empirical precision and rigor (corresponding to the aforementioned conceptual precision and rigor), as it would ensure close correspondence between the conceptualization and operationalization of constructs. *Practically*, mastery-based goals are often the focus of interventions designed to facilitate optimal motivation in sport contexts (Biddle, 2001; Treasure, 2001). Effective interventions require precise targeting of the focal construct in question; at present it is unclear whether this would be task-based standards, self-based standards, or both.

The present research focused on both the structure of achievement goals and their predictive utility. Concerning structure, Study 1 was designed to develop a set of items for each of the six goals of the 3×2 model (the 3×2 Achievement Goal Questionnaire for Sport: 3×2 AGQ-S), and to examine whether task-based and self-based goals emerge as separate constructs in factor analysis. Concerning predictive utility, Study 2 of the present research was designed to investigate whether the task-based and self-based goals in the 3×2 model are differentially associated with other variables that are both conceptually central to the achievement goal literature and have been shown to be associated with achievement goals in prior research in the sport domain.

Developing and evaluating a measure of the 3×2 goals is a necessary first step in the process of putting the 3×2 model to empirical test in the domain of sport. The 3×2 model is intended as a general model of achievement goals, not a model specific to the school domain, but research testing this model in the sport domain

cannot begin until a psychometrically sound and valid measure becomes available. The two studies herein seek to meet this need.

Study 1

Methods

The aim of Study 1 was to develop items for and examine the factor structure and internal consistency of the 3×2 AGQ-S. Alternatives to the hypothesized 3×2 structure were also considered.

Participants

A total of 679 (463 male and 216 female, mean age = 21.5, $SD = 2.36$) undergraduates in a Sport Education class in France voluntarily participated in the study. Participants were active in sport contexts in two ways. First, they encountered 10 h of physical activity per week within their Sport Education class. Second they were competitors and license-holders in a club sport that was federation-affiliated, and they practiced their sport (which varied across participants) on a regular basis (mean time of practice = 6.70 h per week, $SD = 4.07$). Football (soccer), swimming, tennis, basketball, volleyball and dance were the most represented sports among the sample.

In this and the following study, no manipulations and no data exclusions were used, and all variables that were analyzed are reported. Sample sizes were based on the maximum number of participants that could be recruited during the predetermined period of data collection.

Procedure and measure development

A series of pilot studies was conducted prior to the research reported herein. The 18-items of Elliot et al.'s (2011) 3×2 AGQ, which was designed for use in the school domain, were translated, back-translated, and revised for applicability to the sport domain. In line with Elliot et al.'s (2011) procedure, a pool of items (five per goal) was generated to correspond to each of the goal constructs in the sport domain, and a variety of different item sets were tested on several different undergraduate samples (50 participants each time). Participants were informed that they would be shown statements that represented types of goals that they may have when they play sports, and they were instructed to respond on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). At the completion of the pilot work, three items were chosen to represent each achievement goal (see Appendix A for an English translation of the original French version); these item sets were selected on the basis of factorial separation, internal consistency, and face valid coverage of the focal construct. A separate sample of students completed the 18 items of the AGQ-S in a large group session; the items were randomly distributed across the questionnaire.

Results and discussion

Confirmatory factor analysis, descriptive statistics, internal consistencies, and intercorrelations

A confirmatory factor analysis (CFA) was conducted on the covariance matrix of the 18 goal items, and the solution was generated by using maximum likelihood estimation. The results supported the hypothesized six-factor structure. All standardized factor loadings were strong (ranging from .70 to .92), and the fit statistics met the criteria for a good fitting model: $\chi^2(120, N = 679) = 220.86, p < .0001, CFI = .99, IFI = 0.99, RMSEA = .035$. A high level of internal consistency was observed for each achievement goal: task-approach ($\alpha = .80$), task-avoidance ($\alpha = .87$), self-

approach ($\alpha = .86$), self-avoidance ($\alpha = .90$), other-approach ($\alpha = .92$), and other-avoidance ($\alpha = .93$). A one-way MANOVA revealed no significant effect of gender on the achievement goal variables ($F(6, 672) = 1.50, \lambda = .99, p = .17$). Table 1 provides the descriptive statistics and internal consistencies of the achievement goals variables, and their intercorrelations.

Comparison with alternative models

Following Elliot et al.'s (2011) procedure, additional analyses were conducted to compare the fit of the hypothesized model with a series of ten alternative models: (1) a 2×2 model whereby the other-based goals load on their hypothesized latent factors and the same-valenced task-based and self-based goals load together on combined latent factors, (2) a Trichotomous model whereby the other-approach and other-avoidance goals load on their hypothesized latent factors and the task-based and self-based goals load together on a combined latent factor, (3) a Dichotomous model whereby the other-based goals load together on a combined latent factor and the task-based and self-based goals load together on another combined latent factor, (4) a Tap/Tav (task-approach/task-avoidance) model whereby all items load on their hypothesized latent factors except the task-approach and task-avoidance items which load together on a combined latent factor, (5) a Sap/Sav (self-approach/self-avoidance) model whereby all items load on their hypothesized latent factors except the self-approach and self-avoidance items which load together on a combined latent factor, (6) an Oap/Oav (other-approach/other-avoidance) model whereby all items load on their hypothesized latent factors except the other-approach and other-avoidance items which load together on a combined latent factor, (7) an Approach model whereby all avoidance-based items load on their hypothesized latent factors and all approach-based items load together on a combined latent factor, (8) an Avoidance model whereby all approach-based items load on their hypothesized latent factors and all avoidance-based items load together on a combined latent factor, (9) a Definition model whereby all items sharing a competence definition load together on combined latent factors, and (10) a Valence model whereby all items with a shared valence load together on combined latent factors. As can be seen in Table 2, the model comparisons indicated that the hypothesized model provided a better fit to the data than any of the alternative models.

In sum, the factorial structure of the 3×2 AGQ-S showed good psychometric properties, even when compared with alternative models, and each of the six goal scales exhibited good internal consistency. Intercorrelations between achievement goals were consistent with previous findings with the 2×2 model in the sport domain (Conroy et al., 2003; Riou et al., 2012; Wang, Liu, Lochbaum, & Stevenson, 2009) and the 3×2 model in the school domain (Elliot et al., 2011; Wu, 2012).

Study 2

The aim of Study 2 was to again examine the factor structure of the 3×2 AGQ-S, and to also examine relations between the goals of the 3×2 model and other key variables in the achievement goal literature, namely implicit theories of ability, perceived competence, and intrinsic interest. These variables are both central to theoretical accounts of achievement goals, and have been clearly linked to the goals of the 2×2 model in the sport domain.

Implicit theories of ability are an individual's lay theories or beliefs about the nature of ability. Entity theory portrays ability as a fixed capacity that is immutable, whereas incremental theory portrays ability as changeable through effort and persistence (Dweck & Leggett, 1988). In the literature on sport, entity theory

Table 1

Study 1 descriptive statistics, internal consistencies and intercorrelations among achievement goals.

Variable	M	SD	Observed range	Cronbach's α	1	2	3	4	5	6
1. Task-approach goals	6.08	0.88	1–7	.80	—					
2. Task-avoidance goals	5.56	1.22	1–7	.87	.29**	—				
3. Self-approach goals	5.82	1.01	1–7	.86	.40**	.29**	—			
4. Self-avoidance goals	5.44	1.38	1–7	.90	.24**	.44**	.37**	—		
5. Other-approach goals	4.55	1.56	1–7	.92	.28**	.11*	.23**	-.04	—	
6. Other-avoidance goals	4.44	1.55	1–7	.93	.15**	.36**	.24**	.30**	.53**	—

Note. * $p < .01$, ** $p < .001$.

has been shown to be positively related to both performance-approach and performance-avoidance goals in numerous studies (e.g., Cury et al., 2002; Moreno, González-Cutre, Sicilia, & Spray, 2010; Riou et al., 2012; Stevenson & Lochbaum, 2008), whereas no clear pattern is evident for mastery-based goals. Incremental theory has been found to be positively related to mastery-approach goals in numerous studies (e.g., Corrión et al., 2010; Moreno et al., 2010; Riou et al., 2012; Stenling, Hassmén, & Holmström, 2014; Stevenson & Lochbaum, 2008; Warburton & Spray, 2013), has been found to be positively related to mastery-avoidance goals in some studies (Corrión et al., 2010; Wang, Liu, et al., 2009) but not others (Stevenson & Lochbaum, 2008; Warburton & Spray, 2008), and has shown no clear pattern of relations with performance-based goals. Translating the 2×2 findings to the 3×2 model of the present research, we would expect entity theory to be positively related to other-approach and other-avoidance goals, and to be unrelated to task-based and self-based goals; we would expect incremental theory to be positively related to task-approach and/or self-approach goals, to be positively related or unrelated to task-avoidance and/or self-avoidance goals, and to be unrelated to other-based goals.

Perceived competence is an individual's view of his or her present level of ability (Harter, 1982). In the literature on sport, perceived competence has been shown to be positively related to mastery-approach and performance-approach goals in numerous studies (e.g., Cetinkalp, 2012; Morris & Kavussanu, 2009; Spray & Warburton, 2008; 2011; Zourbanos, Papaioannou, Argyropoulos, & Hatxigeorgiadis, in press); it has evidenced no clear pattern of relations with avoidance-based goals. Translating the 2×2 findings to the 3×2 model, we would expect perceived competence to be positively related to task-approach and/or self-approach goals, as well as other-approach goals, and to be unrelated to avoidance-based goals.

Intrinsic interest represents an individual's interest in and enjoyment of an activity for its own sake (Deci & Ryan, 1985). In the literature on sport, intrinsic interest has been shown to be positively related to mastery-approach goals in numerous studies

(e.g., Hulleman, Durik, Schweigert, & Harackiewicz, 2008; Li et al., 2011; Schiano-Lomoriello et al., 2005; Wang et al., 2007), has been found to be positively related to performance-approach goals in some studies (Li et al., 2011; Wang, Koh, & Chatzisarantis, 2009) but not others (Adie & Jowett, 2010; Hulleman et al., 2008), and has evidenced no clear pattern of relations with avoidance-based goals. Translating the 2×2 findings to the 3×2 model, we would expect intrinsic interest to be positively related to task-approach and/or self-approach goals, to be positively related or unrelated to other-approach goals, and to be unrelated to avoidance-based goals.

Methods

Participants

302 undergraduates (213 male and 89 female, mean age = 21.4, $SD = 2.40$) in a Sport Education class in France voluntarily participated in the study. Participants' level of engagement with sport activities was the same as that described in Study 1 (mean time of practice = 6.83 h per week, $SD = 4.33$).

Procedure and measures

Participants completed a questionnaire containing the focal constructs in a large group session.

3×2 AGQ-S. The questionnaire developed in Study 1 was used to assess participants' achievement goals in the sport domain. Scores were computed for task-approach ($\alpha = .87$), task-avoidance ($\alpha = .91$), self-approach ($\alpha = .90$), self-avoidance ($\alpha = .92$), other-approach ($\alpha = .94$), and other-avoidance ($\alpha = .93$) goals; a high level of internal consistency was found for each achievement goal.

Conceptions of athletic ability

Entity and incremental theories of ability were assessed with the Nature of Athletic Ability Questionnaire-2, a French translation of Biddle et al.'s (2003) original questionnaire. Participants responded to the six items assessing entity theory (e.g., "You have a certain level of ability in sport and you cannot really do much to change that level") and the six items assessing incremental theory (e.g., "You need to learn and to work hard to be good at sport") using a 1 (strongly disagree) to 5 (strongly agree) scale. Internal consistency was satisfactory for both incremental theory ($\alpha = .68$) and entity theory ($\alpha = .85$), albeit somewhat weak for the former variable.

Perceived competence

Perceived competence was assessed with Durand, Cury, Sarrazin, and Famose's (1996) French translation from the Intrinsic Motivation Inventory (McAuley, Duncan, & Tammen, 1989). Participants responded to the four items (e.g., "I think I am pretty good in sport") using a 1 (strongly disagree) to 5 (strongly agree) scale. Internal consistency was acceptable ($\alpha = .84$).

Table 2

Study 1 comparison of the hypothesized model and alternative models.

Model	Df	χ^2	IFI	CFI	RMSEA	ECVI
3×2 model (baseline model)	120	220.86	0.99	0.99	0.035	0.48
2×2 model	129	1540.45	0.88	0.88	0.127	2.39
Trichotomous model	132	2521.76	0.81	0.81	0.163	3.83
Dichotomous model	134	3787.85	0.70	0.70	0.200	5.69
Tap/Tav model	125	897.62	0.94	0.94	0.095	1.46
Sap/Sav model	125	1119.53	0.92	0.92	0.108	1.78
Oap/Oav model	125	1544.27	0.89	0.88	0.129	2.41
Approach model	129	1967.61	0.85	0.85	0.145	3.02
Avoidance model	129	2762.46	0.79	0.79	0.173	4.19
Definition model	132	3042.66	0.77	0.77	0.180	4.60
Valence model	134	4689.76	0.63	0.63	0.224	7.02

Note. Tap = task-approach, Tav = task-avoidance, Sap = self-approach, Sav = self-avoidance, Oap = other-approach, Oav = other-avoidance.

Interest

Interest was assessed with Durand et al.'s (1996) French translation of this measure from the Intrinsic Motivation Inventory (McAuley et al., 1989). Participants responded to the four interest items (e.g., “I enjoy sport”) using a 1 (*strongly disagree*) to 5 (*strongly agree*) scale. Internal consistency was acceptable ($\alpha = .72$).

Results and discussion

Confirmatory factor analysis

A CFA was conducted on the covariance matrix of the 3×2 AGQ-S items, and the solution was generated using maximum likelihood estimation. The results again supported the hypothesized six-factor structure. All standardized factor loadings were strong (ranging from .76 to .94), and the fit statistics met the criteria for a good fitting model: $\chi^2(120, N = 302) = 215.55, p < .001, CFI = .98, IFI = 0.99, RMSEA = .051$.

Relations between achievement goals and other variables

The achievement goals were correlated with the implicit theories of athletic ability, perceived competence, and intrinsic interest variables. Entity theory was found to be positively related to other-approach goals ($r = .19, p < .01$) and other-avoidance goals ($r = .13, p < .05$), whereas incremental theory was found to be positively related to task-approach goals ($r = .23, p < .01$) and self-approach goals ($r = .24, p < .01$). Perceived competence was shown to be positively related to task-approach goals ($r = .15, p < .01$) and other-approach goals ($r = .18, p < .01$). Intrinsic interest was found to be positively related to task-approach goals ($r = .27, p < .01$) and self-approach goals ($r = .24, p < .01$). No other relations attained significance. A one-way MANOVA revealed no significant effect of sex on the variables in the study ($F(6, 295) = 1.01, \lambda = .98, p = .42$). All correlations are presented in Table 3.

In sum, the CFA and internal consistency results from Study 2 confirmed the findings from Study 1, again documenting the strong psychometric properties of the 3×2 AGQ-S. Furthermore, the relations between achievement goals and the other variables nicely supported the validity of the measure. Task-based and self-based goals were linked to constructs known to be associated with mastery-based goals, and other-based goals were linked to constructs known to be associated with performance-based goals in prior research on the 2×2 model in the sport domain. The bifurcation of mastery-based goals revealed one differentiated finding: perceived competence was positively related to task-approach but not self-approach goals.

General discussion

The present research represents the first application of the 3×2 model of achievement goals to the sport domain. Study 1 produced

a set of questionnaire items and demonstrated that data from the questionnaire nicely fit the proposed 3×2 model, showed a better fit to the 3×2 model than to any of ten plausible alternative models, and indicated that each of the goal variables had good internal consistency. Study 2 further confirmed the strong psychometric properties of the measure (the 3×2 AGQ-S), linked the goal variables to other constructs central to the achievement goal literature in a manner consistent with extant data on the 2×2 achievement goal model in sport, and provided some promising evidence of differential predictive utility regarding the task/self distinction. Now that the 3×2 AGQ-S is in place, researchers may proceed apace to expand study of the 3×2 goals to a more extensive network of variables in the sport domain (e.g., training strategies, affective experience, performance attainment), using more rigorous and labor intensive methods, such as prospective and longitudinal designs.

The data from the two studies of the present research indicate that the distinction between task-based goals and self-based goals is relevant to the sport domain, as well as the school domain. Participants' goal reports were separable with regard to both the definition (task versus self) and valence (positive versus negative) components of competence. Task-based and self-based goals exhibited a similar nomological network, but an interesting difference was observed. Specifically, perceived competence was positively related to task-approach goals but was unrelated to self-approach goals, which may suggest that in the sport domain, individuals with low, as well as high, perceptions of competence gravitate toward striving for improvement and fulfilling their potential. Additional work is needed to further examine similarities and differences among these variables, as well as similarities and differences in the nomological network of task-based and self-based goals more generally; it would be optimal for such work to not only focus on more variables and methods (as noted above), but also to focus on different types of performance contexts and performers. For example, differentiation may be particularly likely in contexts in which improvement is made salient (e.g., through provision of a “Most Improved Player” award) or among older athletes on the downside of their performance trajectory.

Although we think task-based and self-based goals are distinct forms of regulation in most instances, there is one instance in which they converge to the point of being inextricably intertwined – when concrete personal best times or scores are used as the competence standard (see Stoeber, Uphill, & Hotham, 2009). In this case, the focus of the goal simultaneously represents an absolute standard (a time or score) and a marker of improvement, and thus it fits equally well within the task-approach and self-approach categories. Goals using a more abstract personal best as the competence standard (“perform better than I have ever performed”) do not focus precisely on an absolute standard and therefore may be considered self-approach goals alone, and many times and scores used as the hub of task-approach goals (e.g., “score a goal in this game”) have no direct connection to intrapersonal competence, and therefore may be considered task-approach goals alone.

Another important point to note is that within each goal category, there can be a number of different manifestations and variants of goal pursuit. For example, self-based goals use one's own intrapersonal trajectory as the standard of evaluation, and this standard may represent one's past performance (Albert, 1977) or one's future potential (Markus & Nurius, 1986). In the version of the 3×2 AGQ-S herein, we used one's past performance as the standard, but items could also be derived for self-based goals with one's future potential as the standard (for an example in the school domain, see Elliot, Murayama, Kobesi, & Lichtenfeld, 2014), and used in a slightly revised version of the measure. The achievement settings that individuals encounter in daily life are many and

Table 3
Study 2 correlations between achievement goals and other variables.

Variable	Entity theory	Incremental theory	Intrinsic interest	Perceived competence
Task-approach goals	-.01	.23**	.27**	.15**
Task-avoidance goals	-.05	.09	.01	.00
Self-approach goals	-.03	.24**	.24**	.05
Self-avoidance goals	-.01	.09	.09	-.03
Other-approach goals	.19**	.08	-.00	.18**
Other-avoidance goals	.13*	.07	-.03	.02

Note. * $p < .05$ ** $p < .01$.

varied, and it is important to use achievement goal questionnaires – including the AGQ-S – flexibly (i.e., develop and use different versions and adaptations of the basic measure), to ensure that the goals that are assessed optimally fit the achievement situation.

In using the 3×2 AGQ-S we think flexibility is also warranted regarding the use of all or portions of the goal scales in the measure. Depending on the focal research question, one may want to use the task-approach, self-approach, and other-approach goal scales only (when specifically studying the definition aspect of approach goals) or one may decide to focus on the other-approach and other-avoidance goal scales only (when specifically studying the valence aspect of other-based goals). Most pertinent to the present work, one may seek to use the task-based and self-based goals only, in the interest of furthering an understanding of different types of mastery-based goal scales. This flexible use of subsets of the available goal scales may have the ancillary benefit of helping address the issue of multicollinearity, which is present in the 3×2 AGQ-S and, indeed, all achievement goal measures careful to exclude content extraneous to the achievement goal construct (see Elliot et al., 2011; Hulleman et al., 2010). “Satisficing” (Krosnick, 1991) and other response sets and biases are commonplace among participants completing self-report questionnaires with shared content (e.g., all items representing investments in competence); the use of careful spacing and formatting, instructions urging attentiveness and discrimination, and, in some instances, subsets rather than full item sets would be optimal given such realities.

We believe it is best to view the various models of achievement goals that have emerged in the literature as compatible and complementary, rather than antagonistic or competitive with one another. Each extension of the dichotomous model simply adds to the original model by including further precision regarding the nature of competence-relevant striving: the trichotomous model differentiates between performance-approach and performance-avoidance goals, the 2×2 model differentiates between mastery-approach and mastery-avoidance goals, and the 3×2 model differentiates between task-based and self-based mastery goals. The presence of the more differentiated models does not mean that the less differentiated models should no longer be used, it just means that those using the less differentiated models would do well to be clear and precise about which variant of mastery-based or performance-based goals they are focusing on in their conceptualizations and operationalizations. This clarity and precision benefits users of all models, of course, and should facilitate the accumulation of knowledge that will keep the achievement goal literature informative and generative.

In the present research, we used convenience samples of students in a Sport Education class who were playing different types of club sports, and we assessed achievement goals at a rather broad (“when you play sport”) as opposed to situation-specific level of analysis (see Elliot, 2005; Vallerand, 2007). These features of our research may have reduced the precision with which achievement goals were assessed and the strength of the predictive utility (and, perhaps, differential predictive utility) observed in Study 2. Future research would do well to target a specific sport and a specific type of performance situation in order to attend to these issues. In addition, it is difficult to assess task-based goals at a broad level, as using the task itself as a standard of evaluation is somewhat difficult to convey without referring to specific task features. The task-based items in the present work were designed to be broadly applicable to a variety of sports, which may have allowed other referents to be activated as participants responded (e.g., some participants may have interpreted “my goal is to be effective” in terms of being effective in comparison to others rather than being effective in comparison to the absolute demands of the task).

Flexibility will be needed in assessing task-based goals, to allow investigators to adjust the precise wording of these goal items so that they map directly onto the precise nature of the task at hand.

Research on achievement goals in the sport domain has been greatly facilitated by the development of trichotomous and 2×2 models and measures of achievement goals. Many studies have been conducted over the past 15 years in many different countries using these measures, with the result being a deeper, broader, and more precise understanding of competence-relevant pursuits and their implications in sport settings. The 3×2 AGQ-S represents a logical extension of the trichotomous and 2×2 measures, and it is our hope that it will likewise facilitate research activity in and a better understanding of achievement motivation in the sport domain. The establishment of this measure is a necessary first step toward systematically studying the relevance and utility of the 3×2 achievement goal model in this important area of inquiry.

Appendix A. English translation of the French version of the 3×2 AGQ-S

Instructions: The following statements represent types of goals that you may or may not have when you play sport. For each item, put a mark on the scale from 1 (strongly disagree) to 7 (strongly agree) to indicate your level of agreement with the statement. All of your responses will be kept anonymous and confidential. There are no right or wrong responses, so please be open and honest.

In sport, my goal is.

Task-approach goal items to perform well. to obtain good results. to be effective.	Task-avoidance goal items to avoid performing badly. to avoid bad results. to avoid being ineffective.
Self-approach goal items to do better than what I usually do. to have better results than I had in the past. to be more effective than before.	Self-avoidance goal items to avoid having worse results than I had previously. to avoid doing worse than I usually do. to avoid being less effective compared to my usual level of performance.
Other-approach goal items to do better than others. to be more effective than others. to have better results than others.	Other-avoidance goal items to avoid doing worse than others. to avoid worse results than others. to avoid being less effective than others.

Appendix B. Supplementary data

Supplementary data related to this article can be found at <http://dx.doi.org/10.1016/j.psychsport.2014.11.001>

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