Measuring goal involvement in specific achievement situations: Development and validation of a 6-goal questionnaire

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Measuring Goal Involvement in Specific Achievement Situations: Development and Validation

of a 6-Goal Questionnaire in French

Mesurer l'implication dans les buts en situation d'accomplissement spécifique: Développement et

validation d'un questionnaire à 6 buts en français (FAGIQ-6).

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Date of Submission: 06 August, 2019

Abstract

Introduction

Currently, there is a growing interest regarding the dynamics of achievement goals and its consequences on motivational patterns, which urges researchers to focus more and more on states of goal involvement.

Objective

Based on Elliot, Murayama, and Pekrun's (2011) 6-goal framework, this research aimed to develop and validate a state-like form French Achievement Goal Involvement Questionnaire (FAGIQ-6).

Method

First, a 40-item preliminary version was created. Its clarity was assessed among 152 French undergraduate students. Then, its factorial structure was tested using confirmatory factor analyses on data collected among 439 French junior high school students. Finally, regression analyses on data collected among 317 other junior high school students were used to test how the instrument relates to constructs known to be related to the different achievement goals.

Results

The structure of the FAGIQ-6 included 18 items that were deemed clear and that were organized into six factors (task-approach, self-approach, other-approach, task-avoidance, self-avoidance, and other-avoidance). Regression analyses showed that: Perceived competence positively predicted all approach goals and task-avoidance; an entity theory of ability positively predicted other-referenced goals; an incremental theory of ability positively predicted all task and self goals; task-approach and self-approach positively predicted intrinsic motivation and task absorption; approach goals and task-avoidance positively predicted intrinsic motivation; and other-avoidance positively predicted anxiety.

Conclusion

The FAGIQ-6 can reliably measure goal involvement in specific achievement situations and thus enables new avenues of research on the dynamics of achievement goals.

Résumé

Introduction

Actuellement, il existe un intérêt croissant pour la dynamique des buts d'accomplissement et ses conséquences sur les patrons motivationnels, incitant les chercheurs à se concentrer de plus en plus sur les états d'implication dans ces buts.

Objectif

L'objet du présent travail était de développer et valider un Questionnaire d'Implication dans les Buts d'Accomplissement en Français inspiré du modèle en six buts d'Elliot et al. (2011), le QIBAF-6.

Méthode

Une version préliminaire de 40 items a d'abord été créée. Sa clarté a été évaluée auprès de 152 étudiants de licence français. Sa structure factorielle a ensuite été testée à l'aide d'analyses factorielles confirmatoires sur des données collectées auprès de 439 lycéens français. Enfin, des analyses de régression sur des données collectées auprès de 317 autres lycéens ont été utilisées pour tester la relation entre l'instrument et des construits réputés être reliés aux différents buts d'accomplissement.

Résultats

La structure du QIBAF-6 comprend 18 items, jugés comme clairs, organisés en six facteurs (tâche-approche, soi-approche, autrui-approche, tâche-évitement, soi-évitement et autrui-évitement). Les analyses de régression montrent que : la compétence perçue prédit positivement les buts d'approche et les buts de tâche-évitement ; une conception fixe de la compétence prédit positivement les buts référencés à autrui ; une conception malléable de la compétence prédit positivement tous les buts référencés à la tâche ou à soi ; les buts de tâche-approche et de soi-approche prédisent positivement la motivation intrinsèque et l'absorption dans la tâche ; les buts

d'approche et les buts de tâche-évitement prédisent positivement la motivation intrinsèque ; et les

buts d'autrui-évitement prédisent positivement l'anxiété.

Conclusion

Le FAGIQ-6 permet de mesurer de manière fiable les états d'implication dans les buts dans des

situations d'accomplissement spécifiques et offre ainsi de nouvelles perspectives de recherche

sur la dynamique des buts d'accomplissement.

Mots clés : Approche, évitement, maîtrise, motivation, performance

Measuring Goal Involvement in Specific Achievement Situations: Development and

Validation of a 6-Goal Questionnaire

Achievement motivation corresponds to the desire to feel successful by achieving

challenging goals by means of competence and effort (e.g., Heckhausen, 1974; Murray, 1938).

Despite the constant reference to goals since the earliest definitions of achievement motivation,

conceptualizations of achievement goals did not emerge until the turn of the 1970s and 1980s

(see Elliot, 2005, for a historical review). As of the earliest developments in achievement goal

theory of motivation, goals were considered at both dispositional and situational levels, in an

interactionist perspective according to which individuals' goal orientations interact with

situational factors to determine specific states of goal involvement (Dweck & Leggett, 1988;

Nicholls, 1989). States of goal involvement have been considered the most proximal

determinants of the motivational patterns that individuals display in specific situations (e.g.,

Dweck, 1986; Dweck & Leggett, 1988; Nicholls, 1984, 1989). In follow-up empirical research,

states of goal involvement were most often considered to naturally derive from goal

orientations—as measured with items reflecting usual trends—or to be situationally induced (see

Van Yperen, Blaga, & Postmes, 2015, for a meta-analytic review), but were rarely assessed

directly. Currently, there is a growing interest regarding the dynamics of achievement goals and

its consequences on motivational patterns (e.g., Fryer & Elliot, 2007; Gernigon, Briki, & Eykens,

2010; Gernigon, d'Arripe-Longueville, Delignières, & Ninot, 2004; Gernigon, Vallacher,

Nowak, & Conroy, 2015; Le Bars, Gernigon, & Ninot, 2009; Rebar & Conroy, 2013; Schantz &

Conroy, 2009), which urges researchers to focus more and more on states of goal involvement.

However, to date, a valid instrument has been lacking to specifically measure such states

according to the latest refinements of achievement goal theory, especially in French.

Achievement goal theory developed from a social-cognitive perspective according to which the basic motivational properties of goals are rooted in the criteria that people use to feel competent (e.g., Dweck, 1986; Dweck & Leggett, 1988; Nicholls, 1984, 1989). People may feel competent in a self-referenced sense when they achieve a mastery goal, i.e., a goal that is defined by standards such as mastering a task or improving in that task. They may feel competent in a norm-referenced sense when they achieve a performance goal, i.e., a goal that is defined by standards of social comparison such as demonstrating more competence than others. According to the founders of achievement goal theory (e.g., Dweck, 1986; Nicholls, 1984), mastery goals are assumed to promote adaptive motivational patterns, whereas performance goals are assumed to do so only when associated with confidence regarding one's capability to outperform others. Otherwise, performance goals entail maladaptive motivational patterns.

In the first refinements of the basic tenets of achievement goal theory, Elliot and his colleagues combined the performance dimension (Elliot & Church, 1997; Elliot & Harackiewicz, 1996) then the mastery dimension (Elliot & McGregor, 2001) of achievement goals with the positive versus negative valence of the possible outcome. Positively valenced goals—namely approach goals—are defined in respect of an appetitive outcome (i.e., success), whereas negatively valenced goals—namely avoidance goals—are defined in respect to an aversive outcome (i.e., failure). The sense of competence × valence combination thus resulted in a 2 × 2 goal framework including the following four goals: Mastery-Approach (MAp) that consists in achieving a task or improving in it, Mastery-Avoidance goals (MAv) that reflects either not making mistakes or not doing worse than previously, Performance-Approach goals (PAp) that consists in outperforming others, and Performance-Avoidance goals (PAv) that consists in not being outperformed by others. Generally (see Conroy & Hyde, 2011, and Roberts, Treasure, & Conroy, 2007, for reviews), both MAp and PAp goals were found to be motivationally adaptive,

whereas PAv goals were found to be maladaptive. MAv goals were found to entail mixed

consequences, due to their combination of an adaptive sense of competence with a maladaptive

focus on the likelihood of an aversive outcome resulting from a lack of competence (Elliot &

McGregor, 2001).

Elliot, Murayama, and Pekrun (2011) refined the model most recently by dividing the

mastery dimension of achievement goal into task-based (mastering a task) and self-based

(improving) criteria of competence. These authors then renamed the 'performance' dimension

'other' dimension. This new conceptualization thus consisted of a 3 (task vs. self vs. other) × 2

(approach vs. avoidance) framework including the following six goals: Task-Approach (TAp),

Self-Approach (SAp), Other-Approach (OAp), Task-Avoidance (TAv), Self-Avoidance (SAv),

and Other-Avoidance (OAv). To date, studies that have examined the properties of these six

goals are rare (Elliot et al., 2011; Mascret, Elliot, & Cury, 2015) and any conclusion regarding

the motivational patterns associated with the new task and self dimensions is therefore

premature. For their research, Elliot et al. (2011) created a 6-goal questionnaire they validated in

both English and German. The items used by these authors were phrased so as to apply to a

several-week psychology course for undergraduates. In adapting this questionnaire for French

sport practitioners, Mascret et al. (2015) phrased the items in terms of general goal orientations

that participants may or may not have in sport. The most situational utilization of Elliot et al.'s

(2011) questionnaire was done by Jury, Smeding, and Darnon (2015). These authors asked golf

players to answer the items in reference to specific types of games. However, the instructions

that were provided to the participants referred to goals they might pursue when they play without

competition or for given types of competition (with intrapersonal vs. interpersonal standards).

Therefore, the situations were virtual and were described in generic terms. Moreover, the

phrasing of Elliot et al.'s items remained unchanged. Therefore, 6-goal questionnaires using

state-like form items still need to be developed, especially for French populations. To help

satisfy this need, the present twofold research aimed to develop and validate a 6-goal French

instrument that can measure states of goal involvement in specific achievement situations: the

French Achievement Goal Involvement Questionnaire (FAGIQ-6) [1]. In a first study, a

preliminary version of the FAGIQ-6 was created, the factorial structure of which was then tested.

In a second study, the congruence of the latest version with constructs known to be related to the

different achievement goals was examined.

Study 1

This first study, which was intended to create a preliminary version of the FAGIQ-6 and

to test its factorial structure, consisted of three phases: (a) first selection and adaptation of items,

(b) assessment of items clarity and second selection, and (c) examination of the factorial

structure, including the test of its invariance across gender.

Items First Selection and Adaptation

A committee of three achievement motivation researchers selected 40 items from Elliot

and Murayama's (2008) and Elliot et al.'s (2011) achievement goal questionnaires, as well as

from the French version of Elliot and Murayama's questionnaire that was developed by Riou et

al. (2012). Then, items from the English-language versions were back-translated: They were first

translated from English to French by a bilingual researcher. Then they were back-translated from

French to English by an independent bilingual translator who finally checked that the back

translation conformed with the original items and suggested adaptations when needed. Finally,

the resulting items were adapted into a state-like form so as to be used with respect to a specific

task. This adaptation situated the items in the immediate present by using the present tense and

preceding each items by the following generic phrase: "During this exercise...".

This preliminary version included seven items intended for TAp goals (e.g., "I am striving to carry out what I have to do as thoroughly as possible"), seven items for SAp goals (e.g., "I am striving to do better than I usually do"), eight items for OAp goals (e.g., "I am striving to do better than others"), six items for TAv goals (e.g., "I am striving to avoid doing things incompletely"), five items for SAv goals (e.g., "I am striving not to do less well than before"), and seven items for OAv goals (e.g., "My goal is to avoid being outperformed by others").

Assessment of Items Clarity and Second Selection

The 40 items were distributed by packs of 10 among 152 undergraduate students in sports sciences (M_{age} = 18.6; SD = .82) from the greater Paris region and the west of France. These students voluntarily and anonymously assessed the clarity of the items on a 5-point Likert-type scale ranging from 1 (very unclear) to 5 (very clear). Some items that were in the TAv goals and SAv goals subsets obtained an average score of clarity below 3^2. These items were reviewed by a committee of three researchers and three students who then suggested new phrasings to improve their clarity. Then, the whole set of items—including those that were modified—was submitted to a new sample of 87 undergraduate students (M_{age} = 18.2; SD = .92), according to the same conditions as the previous set. Ratings resulting from this second wave of assessment ranged from 3.01 to 4.85 (M = 4.5; SD = .80), thus reflecting levels of clarity ranging from acceptable to very good. However, given that goal involvement may correspond to very transient states, the FAGIQ-6 needed to be completed quickly and therefore as short as possible. With this intent, only the clearest three items of each type of goal were retained for the rest of the study. As a result, the new version of the FAGIQ-6 included 18 items (see Appendix), the minimal clarity index of which was 3.10.

Examination of the Factorial Structure

Method. A sample of 442 French students (212 males; 230 females; M_{age} = 15.6; SD = 1.18)—for whom parents' consents had been obtained—participated in the study of the factorial structure of the FAGIQ-6. They came from 20 different classes belonging to two junior high schools and six high schools. Three participants (2 males; 1 female) answered less than 90% of the items and were therefore excluded from the statistical analyses.

The students were enrolled in the study on the spot during Physical Education (PE) lessons during which the students were to carry out approximately 20-min exercise intended for them to learn a specific motor skill. Right before the lesson started, students (a) listened to and read the usual guarantees of confidentiality, (b) signed a formal consent, and (c) answered a few biographical questions. Then, in the middle of the lesson, while the students were doing the exercise, they were asked to stop working for a while to answer the 18 items—in relation to the ongoing exercise— of the FAGIQ-6 on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Participants' scores for the 18 items of the FAGIQ-6 were submitted to a Confirmatory Factor Analysis (CFA) that was processed using SPSS AMOS 21© program. Before analysis, values were attributed to missing data (n = 0.40%) using the regression imputation method of the Data Imputation module of the program. Then the CFA was computed on a covariance matrix to yield a solution based on maximum-likelihood estimation. In the loading matrix, every error covariance was constrained to zero, but covariances between latent factors were allowed. The target model to be tested was the 6-goal model (model A) that distinguishes TAp, SAp, OAp, TAv, SAv, and OAv items. However, alternative models that have punctuated the evolvement of achievement goal theory were also tested and compared to our hypothesized model: A 4-goal model (model B) according to which TAp and SAp items would be gathered into one MAp factor and TAv and SAv items into one MAv factor, whereas OAp and OAv factors would be

kept unchanged; an approach-avoidance model (model C) in which all approach items would load together on the same factor and all avoidance items on another factor; a mastery-other model (model D) in which all items including either a task or self- based definition of competence would load together on one mastery factor, whereas all other-based items would load on an other-based factor. The fit indices that were considered included the χ^2/df ratio, the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), the RMSEA's 90% confidence interval, and the Akaike Information Criterion (AIC). Cronbach's coefficients alpha were also calculated to account for the internal consistencies of the subscales. Consistent with Kline's (2005) recommendations, the criteria used to support the model's adequacy with respect to the data were: $\chi^2/df < 3.00$; CFI > .90; TLI > .90; and RMSEA < .08. As recommended by Chen, Curran, Bollen, Kirby, and Paxton (2008), the lower and upper bounds of the RMSEA's 90% confidence interval should be lower than .05 and .1, respectively. The AIC enables multiple models comparisons, the lower the AIC value the better the fit. Internal consistencies were considered good for coefficients alpha above .70, but acceptable for coefficients alpha above .60 for scales with a limited number of items (Nunnally & Bernstein, 1994), which is the case for the FAGIQ-6, since each of its scales includes the allowed minimum of three items. For each model tested, the statistical power associated with the likelihood of a given model fit—as reflected by the RMSEA's confidence interval (MacCallum, Browne, & Sugawara, 1996)—was calculated using Preacher and Coffman's (2006) online software. Intercorrelations among the six scales of the FAGIQ-6 were also calculated in order to assess the discriminant validity of the instrument. Finally, the invariance across gender of the best fitting model was tested following the method recommended by Byrne (2016) for AMOS users. This method consists of testing the differences of fit between groups (here males and females) for increasingly more stringent models, namely: *the unconstrained model* (no parameter

is set equal across groups), the *measurement weights* model (all factor loadings of the indicator variables are set equal across groups), the *structural covariances model* (the constrained inter-group equality is extended to factor variances and covariances), then the *measurement residuals model* (constraints are extended to error variances).

Results. The fit indices related to the four competing models are displayed in Table 1. Only models A and B showed acceptable psychometric properties. For these models, all the indices were good. However, model A displayed the lowest AIC index, thus showing a better fit to the data than the 4-goal model. For all models, the statistical power associated with an RMSEA index below the limit of .08 was very high (power estimate = 1.00). All the intercorrelations among the six scales of the FAGIQ-6 were significant with coefficients r ranging from .13 ($p <$ .01) to .73 ($p <$ .001). Coefficients alpha were satisfactory, ranging from .66 to .86. Correlation coefficients as well as all coefficients alpha and the descriptive statistics for the six scales are displayed in Table 2.

Insert Table 1 and Table 2 about here

As evidenced by the fit indices presented in Table 3, the test of invariance across gender of the 6-goal model revealed that each of the increasingly constrained models (i.e., unconstrained, measurement weights, structural covariances, and measurement residuals) achieved a good fit. More importantly, none of the differences of fit between males and females was significant ($\Delta p >$ .05). These results show that the 6-goal model quality of fit is robustly invariant across gender.

Insert Table 3 about here

Discussion

This first study aimed to create a version of the FAGIQ-6 that is made of clear items reflecting here-and-now goal involvement and that displays a satisfactory 6-goal factorial structure. Such was the case since the clearest 18 items were selected from a pool of 40 state-like form items which all had obtained scores above the middle of the clarity assessment scale. The fit indices yielded by the CFA supported the validity of the factorial structure and the internal consistencies were found to be satisfactory, as for any short-subscale questionnaire. The results indicated that the hypothesized 6-goal model provided a better fit than any of the alternative models and was found to be invariant across gender. However, the 4-goal model also showed acceptable psychometric properties. As in Elliot et al.'s (2011) research (study 2) as well as in Jury et al.'s (2015) research on self- and other-based goals, all the subscales were found to be correlated to each other. According to these authors, the similar wording of different items (e.g., see Murayama, Elliot, & Yamagata, 2011, for the specific cases of PAp and PAv items) may prompt a bias of similarity in the responses. Moreover, the combinatory mode (sense of competence × valence) of construction of the goals entails that the same definition of competence or the same valence may be shared by different goals. These overlapping dimensions are classically mentioned as accounting for the correlations that are usually observed among goals of the combinatory frameworks of achievement goals (e.g., Elliot & Church, 1997; Elliot & McGregor, 2001; Elliot & Murayama, 2008; Elliot et al., 2011; Murayama et al., 2011).

Study 2

This second study aimed to contribute to the assessment of the construct validity of the FAGIQ-6 by testing the relationships of the FAGIQ-6 with constructs that are known to be

related to achievement goals. Among these constructs, implicit theories of ability and perceived competence were considered antecedents of achievement goals, whereas intrinsic motivation, absorption, and anxiety regarding a specific task were considered consequences of achievement goals.

Implicit theories of ability (Dweck & Leggett, 1988) are general beliefs that persons develop about the incremental (i.e., malleable) or entity (i.e., fixed) nature of ability. Past research has evidenced a consistent relationship between incremental theory and MAp goals, whether incremental theory was found to positively predict (Corrion et al., 2010; Moreno, González-Cutre, Sicilia, & Spray, 2010) or to be positively correlated with (Riou et al., 2012) MAp goals. This relationship was then confirmed within the 6-goal framework since Mascret et al. (2015) found incremental theory to be positively related to both TAp and SAp goals. The literature, however, reports inconsistent patterns of relationships between incremental theory and the other achievement goals (see Conroy & Hyde, 2011; Roberts et al., 2007). Past research has also evidenced consistent relationships between entity theory and both performance(other)-approach and performance(other)-avoidance goals. Entity theory has been found to positively predict (Corrion et al., 2010; Moreno et al., 2010) or to be positively correlated with (Mascret et al., 2015; Riou et al., 2012) performance(other)-approach goals. Entity theory has also been found to positively predict (Corrion et al., 2010; Elliot & McGregor, 2001; Moreno et al., 2010) or to be positively correlated with (Mascret et al., 2015; Riou et al., 2012) performance(other)-avoidance goals. However, inconsistent patterns of relationships between entity theory and mastery-based goals have been reported in the literature (see Conroy & Hyde, 2011; Roberts et al., 2007). Based on these findings, for the present study, incremental theory was expected to positively predict both TAp and SAp goals, whereas entity theory was expected to positively predict both OAp and OAv goals.

Broadly defined, perceived competence is a person's belief regarding his or her ability on a specific task or category of tasks, whether this belief is a perception relating to past experiences (e.g., Harter, 1978; White, 1959) or an expectancy for future experiences (e.g., Bandura, 1997). Perceived competence has been found (a) to positively predict (e.g., Elliot & Church, 1997) or to be positively correlated with (e.g., Ommundsen, 2004; Riou et al., 2012) MAp goals; (b) to positively predict (e.g., Elliot & Church, 1997) or to be positively correlated with (e.g., Mascret et al., 2015; Ommundsen, 2004) performance(other)-approach goals; and (c) to negatively predict (Elliot & Church, 1997) or to be negatively correlated with (Ommundsen, 2004) PAv goals. The literature, however, does not show any consistent pattern of relationships between perceived competence and MAv goals. Specifically regarding the task/self distinction brought by the 6-goal framework, perceived competence has been found to be positively linked with TAp goals but not with SAp goals (Mascret et al., 2015). Moreover, contrary to the 4-goal framework literature that reported negative links between perceived competence and PAv goals, no links have been found between perceived competence and OAv goals (Mascret et al., 2015). Therefore, for the present research, we hypothesized that perceived competence positively predicts only TAp goals and OAp goals.

Intrinsic motivation is a type of motivation that is activated when an activity is performed for its own sake because it is felt as enjoyable (Deci & Ryan, 1985). Intrinsic motivation has been found to be positively predicted by MAp goals (e.g., Elliot & Harackiewicz, 1996; Elliot & Murayama, 2008; Hulleman, Durik, Schweigert, & Harackiewicz, 2008; Hulleman, Schrager, Bodmann, & Harackiewicz, 2010), but not by MAv goals (Elliot & Murayama, 2008). As regards the relationships between intrinsic motivation and the other types of goals, inconsistent findings have been reported in the literature. Thus, intrinsic motivation was found to be either positively related (e.g., Elliot & Harackiewicz, 1996; Skaalvik, 1997, Study 2) or not related (e.g., Elliot &

Church, 1997; Elliot & Murayama, 2008; Elliot et al., 2011; Hulleman et al., 2008; Mascret et al., 2015) to performance(other)-approach goals and either negatively related (e.g., Elliot & Church, 1997; Elliot & Harackiewicz, 1996) or not related (e.g., Elliot et al., 2011; Mascret et al., 2015) to performance(other)-avoidance goals. The few studies that used the task/self distinction within mastery-based goals showed that TAp goals positively predict (Elliot et al., 2011) or are positively correlated with (Mascret et al., 2015) intrinsic motivation. SAp goals have also been found to positively correlate with intrinsic motivation (Mascret et al., 2015). Therefore, we hypothesized that TAp and SAp goals positively predict intrinsic motivation, whereas TAv and SAv goals do not. Given the inconsistencies of the literature regarding the relationships between intrinsic motivation and either OAp goals or OAv goals, the present study remained exploratory with respect to these relationships.

Task absorption is a specific case of task involvement that corresponds to cognitive immersion in a task resulting in high level of concentration and track of time loss (Elliot & Harackiewicz, 1996). Task absorption has been found to be positively predicted by MAp goals (Cury, Elliot, Sarrazin, Da Fonséca, & Rufo, 2002; McGregor & Elliot, 2002), and more specifically by TAp goals (Elliot et al., 2011). Some studies revealed that task absorption is positively predicted by PAp goals (e.g., Cury et al., 2002) while other studies have shown these constructs unrelated (e.g., McGregor & Elliot, 2002). Task absorption has sometimes been found to be negatively predicted by PAv goals (Cury et al., 2002; McGregor & Elliot, 2002) and sometimes unrelated to this type of goal (Elliot et al., 2011). Therefore, for task absorption, we hypothesized that TAp goals are a positive predictor. However, the inconsistencies of the literature regarding the relationships between task absorption and OAp and OAv goals did not enable us to express any hypothesis about these goals.

Anxiety is a negative feeling associated with negative expectations and negative concerns about oneself confronted with a situation or regarding its outcome (e.g., Morris, Davis, & Hutchings, 1981). In achievement contexts, anxiety (or worry in some studies) has been found to be positively predicted by performance(other)-avoidance goals (e.g., Cury, Da Fonséca, Rufo, Peres, & Sarrazin, 2003; Cury et al., 2002; Elliot & McGregor, 2001; Elliot et al., 2011; McGregor & Elliot, 2002). The other achievement goals—whether based on the 4- or the 6-goal framework— have generally not been found to predict anxiety (e.g., Elliot & McGregor, 2001; Elliot et al., 2011; McGregor & Elliot, 2002). Therefore, we hypothesized anxiety to be positively predicted by OAv goals, whereas the other goals should not display any predictive property regarding anxiety.

Method

Participants. A new sample of 317 French students (149 males; 168 females; M_{age} = 14.8; SD = 1.02)—whose parents gave their consent—voluntarily participated in this study. They came from 13 classes other than those involved in Study 1, belonging to the same junior high schools and high schools as for Study 1.

Procedure. The procedure resembled the last part of Study 1 that was devoted to the examination of the factorial structure of the FAGIQ-6. It differs, however, in that students were given the implicit theories of sport ability questionnaire before the PE lesson, because its items refer to global conceptions of ability in PE and sport, rather than to a specific task. Then, during the PE lesson, students carried out a learning task, in the middle of which they were asked to answer the FAGIQ-6 as well as questions measuring perceived competence, task absorption, anxiety, intrinsic motivation, and implicit theories of sport ability (completed in this order).

Measures. The six types of achievement goals were measured with the 18-item version of the FAGIQ-6 that was obtained in Study 1. The reassessment of the internal consistencies of

the six scales revealed satisfactory coefficients alpha (TAp: α = .71; SAp: α = .74; OAp: α = .90;

TAv: α = .67; SAv: α = .68; OAv: α = .81) that were very close to those found in Study 1.

The implicit theories of sport ability were measured with the Conception of Sport Ability

French Questionnaire (Sarrazin et al., 1995). This instrument includes two subscales: the entity

theory scale that includes eight items (e.g., "One has a certain level of ability in sport, and there

is not much one can do to change it") and the incremental theory scale that includes seven items

(e.g., "If one works hard and often, one can change one's level of ability in sport"). Degrees of

agreement with these items were indicated on a 5-point Likert-type scale ranging from 1

("Completely disagree") to 5 ("Completely agree"). The score for each subscale was the average

score of its items. For the present research, good internal consistencies were found for both entity

theory (α = .86) and incremental theory (α = .81) scales.

Perceived competence regarding the task was measured with the Perceived Competence

subscale of the Scale of Satisfaction of the Fundamental Needs in Sport Context developed in

French by Gillet, Rosnet, and Vallerand (2008). The five items (three of them inverted) of this

subscale were adapted into a state-like form by changing sentences such as "In my sport, I often

feel successful" to "During this exercise, I felt successful". Items were answered on a 7-point

Likert-type scale ranging from 1 ("Completely disagree") to 7 ("Completely agree"). The score

of perceived competence was the average score of the five items. In Gillet et al.'s (2008)

validation study, the internal consistency was satisfactory for perceived competence (α = .72).

However, the present research failed in replicating this psychometric quality (α = .57). Testing

different combinations of the items of the scale revealed that the best internal consistency (α =

.64) was found after removing one item ("I did not have many possibilities to show what I'm

capable of"). Given this marginally acceptable internal consistency, caution should be exercised

when interpreting results regarding perceived competence.

Intrinsic motivation was measured with the corresponding subscale of Guay, Vallerand, and Blanchard's (2000) Situational Motivation Scale, a French-language scale. This intrinsic motivation subscale includes four items (e.g., "I think this activity was interesting") to be answered on a 7-point Likert-type scale ranging from 1 ("Completely disagree") to 7 ("Completely agree"). The score of intrinsic motivation was the average score of the four items. For the present research, the internal consistency of this scale was good ($\alpha = .85$).

Task absorption was measured with a French version of the scale used by Elliot and Harackiewicz (1996). This scale includes six items (three of them inverted) that were back-translated (e.g., "When doing this exercise, I concentrated on what I had to do"). Items were answered on a 7-point Likert-type scale ranging from 1 ("Completely disagree") to 7 ("Completely agree"). The score of task absorption was the average score of the six items. For the present research, the internal consistency of this scale was found to be satisfactory ($\alpha = .76$).

Anxiety was measured with the Cognitive Anxiety subscale of Martinent, Ferrand, Guillet, and Gautheur's (2010) French version of Cox, Martens, and Russel's (2003) Competitive State Anxiety Inventory-2 Revised. This subscale includes five items (e.g., "I was afraid of failing") to be answered on a 4-point Likert-type scale ranging from 1 ("Not at all") to 4 ("Very much so"). The score of anxiety was the average score of the 5 items. For the present research, the internal consistency of the anxiety scale was good ($\alpha = .80$).

Throughout the whole data set resulting from the administration of these questionnaires, missing data were detected and completed using the automatic method of the Data Imputation module of the SPSS Statistics 21[©] program that was used to compute the regression analyses ($n = 0.41\%$). For each multiple regression analysis, statistical power was calculated using the G*Power 3.1[©] program with risks α and β set at .05 and .2, respectively.

Results

First, six multiple regression analyses were conducted to test the relationships between the six types of achievement goals and their hypothesized antecedents. Then three other multiple regression analyses were conducted to test the relationships between achievement goals and their three hypothesized consequences. Results from these nine regression analyses are showed in Table 4. For all these analyses, the statistical power was very high (power estimate = 1.00).

Insert Table 4 about here

As regards potential antecedents, each type of achievement goal was regressed on both implicit theory of ability and perceived competence. TAp goals were positively predicted by incremental theory of ability ($\beta = .27$, $R^2 = .08$, $p < .001$) and perceived competence ($\beta = .15$, added $R^2 = .02$, $p = .005$). SAp goals were positively predicted by incremental theory of ability ($\beta = .14$, $R^2 = .02$, $p = .010$) and perceived competence ($\beta = .11$, added $R^2 = .01$, $p = .043$). OAp goals were positively predicted by entity theory of ability ($\beta = .17$, $R^2 = .03$, $p = .002$) and perceived competence ($\beta = .16$, added $R^2 = .03$, $p = .004$). TAv goals were positively predicted by incremental theory of ability ($\beta = .26$, $R^2 = .07$, $p < .001$) and perceived competence ($\beta = .12$, added $R^2 = .01$, $p = .031$). SAv goals were positively predicted by incremental theory of ability ($\beta = .12$, $R^2 = .02$, $p = .028$). OAv goals were positively predicted by entity theory of ability ($\beta = .23$, $R^2 = .05$, $p < .001$). All the other relationships between types of achievement goal involvement and potential antecedents were not significant ($p > .05$).

As regards consequences, each of the three potential consequences of goals was regressed on the six achievement goals. Intrinsic motivation was positively predicted by TAp goals ($\beta = .21$, $R^2 = .19$, $p = .003$), OAp goals ($\beta = .16$, added $R^2 = .04$, $p = .002$), SAp goals ($\beta = .17$, added $R^2 = .02$, $p = .013$), and TAv goals ($\beta = .14$, added $R^2 = .01$, $p = .028$). Task absorption was

positively predicted by TAp goals (β= .26, R^2 = .16, p < .001) and SAp goals (β = .21, added R^2 = .02, p = .003). Anxiety was positively predicted by OAv goals (β = .24, R^2 = .06, p < .001). All the other relationships between types of achievement goal involvement and potential consequences were not significant (p > .05).

Discussion

This second study aimed to test the relationships of the different types of achievement goal involvement measured by the FAGIQ-6 with some hypothesized antecedents of these goals—namely implicit theories of ability and perceived competence—and with some of their hypothesized consequences—namely intrinsic motivation, task absorption, and anxiety.

As regards implicit theories of ability, incremental theory was expected to positively predict both TAp and SAp goals, whereas entity theory was expected to positively predict both OAp and OAv goals. Results from regression analyses supported these hypotheses as well as previous findings reported in the literature (e.g., Corrion et al., 2010; Mascret et al., 2015; Moreno et al., 2010; Riou et al., 2012). In addition to these expected relationships, and unlike Mascret et al.'s (2015) findings, incremental theory was also found to positively predict both TAv and SAv goals. As a result, incremental theory positively predicted every mastery goal, whether mastery was considered task- or self-referenced and whether the valence of the outcome was appetitive (approach) or aversive (avoidance). However, given the paucity of research on the 6-goal framework, this pattern of relationships between incremental theory of ability and all types of mastery-based goals needs to be supported by future studies.

We also expected perceived competence to positively predict TAp goals and OAp goals. Consistent with these hypotheses, TAp goals and OAp goals were found to be predicted by perceived competence, thus supporting the relationships between perceived competence, on the one hand, and TAp goals (Mascret et al., 2015) and performance(other)-approach goals (Elliot &

Church, 1997; Mascret et al., 2015; Ommundsen, 2004), on the other hand. Moreover, unlike in

Mascret et al.'s (2015) research, perceived competence was found to positively predict both SAp

goals and TAv goals. The prediction of SAp goals by perceived competence is however

consistent with the literature on MAp goals (e.g., Elliot & Church, 1997; Ommundsen, 2004;

Riou et al., 2012). The statistical indices β, R^2, and p yielded by the regression analyses show

that the prediction of SAp goals by perceived competence was slightly weaker than that of TAp

goals. This weaker prediction of SAp goals, as well as their absence of prediction by perceived

competence that was found by Mascret et al. (2015), might reflect that the more a person feels

competent, the more likely he or she can expect to achieve a task—and thus adopt a TAp goal—

and the less likely he or she can expect to improve—which may lower the adoption of SAp

goals. As regards TAv goals—and more generally MAv goals—, the literature addressing their

correlates is inconsistent, probably because of the ambivalent nature of such goals, which

combines an adaptive definition of competence and a maladaptive valence (see Elliot &

McGregor, 2001).

   Intrinsic motivation was expected to be positively predicted by both TAp goals and SAp

goals. Our results perfectly support this hypothesis, as well as past findings regarding the

relationships between intrinsic motivation and MAp goals (e.g., Elliot & Harackiewicz, 1996;

Elliot & Murayama, 2008; Hulleman et al., 2008; Hulleman et al., 2010) or TAp (Elliot et al.,

2011; Mascret et al., 2015) and SAp (Mascret et al., 2015) goals. Our exploratory investigation

of the relationships between intrinsic motivation and OAp and OAv goals revealed that intrinsic

motivation was positively predicted by OAp goals and was not predicted by OAv goals. These

findings provide additional pieces to the literature, a part of which already showed that intrinsic

motivation is positively related to performance(other)-approach goals (e.g., Elliot &

Harackiewicz, 1996; Skaalvik, 1997, Study 2) and not related to performance(other)-avoidance

goals (e.g., Elliot et al., 2011; Mascret et al., 2015). Surprisingly, we found TAv goals to positively predict intrinsic motivation. Again, the adaptive property of TAv goals may be due to the prevalence of the adaptive criterion used to define competence—namely mastering a task—over the undesirable valence of an outcome to be avoided (e.g., Elliot & McGregor, 2001).

We expected task absorption to be positively predicted by TAp goals. Our results support this hypothesis and Elliot et al.'s (2011) findings. However, unlike Elliot et al., we found SAp goals to also positively predict task absorption. Therefore, the separate task and self constructs of the 6-goal framework did not yield distinctive consequences regarding task absorption. However, it should be noted that the statistical indices accounting for the prediction of task absorption were better for TAp goals than for SAp goals. OAp goals and OAv goals were found unrelated to task absorption. Though these findings do not support those of research that showed PAp goals (Cury et al., 2002) and PAv goals (Cury et al., 2002; McGregor & Elliot, 2002), respectively, to be positively and negatively related to task absorption, they support Elliot et al.'s (2011) findings that both OAp and OAv goals are unrelated to task absorption.

Anxiety was expected to be positively predicted by OAv goals and not predicted by the other goals. Our results fully support these hypotheses and are in agreement with the literature having addressed the relationships between achievement goals and anxiety (e.g., Elliot & McGregor, 2001; Elliot et al., 2011; McGregor & Elliot, 2002).

General Discussion

The aim of the present research was to develop and validate the French Achievement Goal Involvement Questionnaire (FAGIQ-6), a questionnaire that is based on Elliot et al.'s (2011) 6-goal framework and that can measure the here-and-now states of goal involvement in specific achievement situations.

In a first study, a preliminary version of the FAGIQ-6 was created by selecting and adapting items from previous instruments (Elliot & Murayama, 2008; Elliot et al., 2011; Riou et al., 2012). These items then underwent a second selection based on the assessment of their clarity. These successive selections led to retain 18 items, the factorial structure of which revealed six dimensions corresponding to the six goals of Elliot et al.'s (2011) framework. This 6-factor structure fitted the data well, was invariant across gender, and all the items showed good loadings on their respective factors. The six goal subscales had internal consistencies ranging from satisfactory to good.

In a second study, the relationships of the FAGIQ-6 with constructs known to be linked to achievement goals were tested. Two potential antecedents of achievement goals were considered: implicit theories of ability and perceived competence. Consistent with our hypotheses and the literature, incremental theory positively predicted both TAp and SAp goals, whereas entity theory positively predicted both OAp and OAv goals. Unexpectedly, incremental theory also positively predicted both TAv and SAv goals. Therefore, incremental theory was found to be an omnibus antecedent for every type of mastery-based goals, which remains to be confirmed in future research. As expected, perceived competence positively predicted TAp goals and OAp goals. In addition, perceived competence positively predicted SAp goals, to a lesser extent than TAp goals. The weaker sensitivity of SAp goals—which are defined in terms of improvement—to perceived competence might be due the ceiling effect that applies when perceived competence is high. Perceived competence also positively predicted TAv goals. This finding is to be considered with regard to the inconsistency of the literature addressing the correlates of MAv goals (e.g., Elliot & McGregor, 2001).

Three potential consequences of achievement goals were examined in the second study: intrinsic motivation, absorption, and anxiety. Intrinsic motivation was positively predicted by all

approach-based goals, namely TAp goals (Elliot et al., 2011; Mascret et al., 2015), SAp goals (Mascret et al., 2015), and OAp goals (e.g., Elliot & Harackiewicz, 1996; Skaalvik, 1997, Study 2). However, intrinsic motivation was also positively predicted by TAv goals. Again, this unexpected finding concerning TAv goals may be due to their bivalent nature (Elliot & McGregor, 2001) in which the adaptive definition of competence may prevail over the maladaptive valence of the outcome. Consistent with our hypotheses and Elliot et al.'s (2011) findings, TAp goals positively predicted task absorption. SAp goals also positively predicted task absorption, but to a lesser extent than did TAp goals. As expected, and consistent with past findings (e.g., Elliot & McGregor, 2001; Elliot et al., 2011; McGregor & Elliot, 2002), OAv goals appeared to be the only (positive) predictor of anxiety.

To sum up, the results of our second study support the findings of past research based on both the 4-goal framework and the 6-goal framework. On the one hand, goals with the most adaptive sets of antecedents and consequences are the two originating from MAp goals, namely TAp goals and SAp goals (positively related to incremental theory, perceived competence, intrinsic motivation, and task-absorption). On the other hand, goals with the least adaptive sets of antecedents and consequences are the ex-PAv goals, namely OAv goals (positively related to entity theory and anxiety). Between these extremes, the two goals originating from MAv goals, namely TAv goals (positively related to incremental theory, perceived competence, and intrinsic motivation) and SAv goals (positively related to incremental theory) were found to have adaptive correlates, whereas OAp goals were found to have both adaptive (perceived competence and intrinsic motivation) and maladaptive correlates (entity theory).

Compared to previous models, the utility of Elliot et al.'s (2011) 6-goal model rests on the relevance of the subdivision of mastery-based goals into task- and self-based goals. The present research shows that all task- and self-based goals have adaptive correlates. However, all the

relationships involving task-based goals were of larger magnitude and/or of higher significance than those involving self-based goals. Moreover, specifically regarding avoidance-based goals, the number of adaptive correlates was higher for TAv goals than for SAv goals. As a result, task-based goals appear to entail more adaptive consequences than do self-based goals, which is consistent with the findings of the rare studies based on the 6-goal framework (Elliot et al., 2011; Mascret et al., 2015). As an explanation for these differences between the consequences of task-based and those of self-based goals, Elliot et al. (2011) pointed out that, compared to the self-dimension, the task dimension reflects a "more direct and immediate nature of competence evaluation" (p. 641).

To conclude, the FAGIQ-6 is a valid and reliable questionnaire that supports the relevance of Elliot et al.'s (2011) 6-goal model where the mastery dimension of achievement goals is subdivided into task and self dimensions. However, studies based on the 6-goal model remain scarce and their findings—including those of our study—still need further empirical support. Future research should therefore attempt to confirm and enlarge the spectra of antecedents and consequences that are specific to each achievement goal. As it has been done for questionnaires associated with previous achievement goal frameworks, it would be interesting to test the sensitivity of the FAGIQ-6 to experimental conditions (e.g., Gernigon, d'Arripe-Longueville, Debove, & Puvis, 2003) and to specific goal-involving climates (Le Bars, Ferron, Maïano, & Gernigon,2006; Le Bars et al., 2009). For instance, there is a need to examine the specific conditions of achievement contexts under which ambivalent goals (i.e., combining adaptive and maladaptive dimensions) such as TAv goals and SAv goals may be associated with adaptive (e.g., Riou et al., 2012) or maladaptive (e.g., Gernigon, Pereira Dias, Riou, Briki, & Ninot, 2015) consequences. For instance, Gernigon et al. (2015) have suggested that the perceptions of benefit and threat for the self—as they may emanate from a given situation—

might be among the key determinants of motivational patterns of approach and avoidance. One important property of the FAGIQ-6 is its suitability in measuring states of goal involvement in specific achievement situations. From an applied perspective, its state-like form items flag such states here and now, allowing them to be regulated most appropriately when needed. From a theoretical standpoint, the situational focus of the FAGIQ-6 enables research—from the 6-goal perspective—into the dynamics of achievement goals (Fryer & Elliot, 2007; Gernigon et al., 2004; Rebar & Conroy, 2013; Schantz & Conroy, 2009).

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Footnotes

[1] Although this research was neither medical nor experimental, the ethical principles of human experimentation advocated in the Helsinki Declaration were followed in both studies. The authors declare no conflicts of interest with respect to the authorship or the publication of this article.

[2] The interested reader can contact the corresponding author (anne.teboul-um@hotmail.com) to get more information about which items of TAv and SAv goals were concerned.

1 Appendix

2 Items of the French Achievement Goal Involvement Questionnaire - 6 (FAGIQ-6)

3 (English translations are in italics)

4

5 "Au cours de cet exercice... "
6 *"During this exercise..."*
7

Task-Approach Goals:

Je cherche à réaliser le mieux possible ce que je dois faire.
I am striving to carry out what I have to do as thoroughly as possible.

Mon but est d'apprendre le plus possible.
My goal is to learn as much as possible.

Mon but est de bien réaliser cet exercice.
My goal is to do this exercise well.

Self-Approach Goals:

Mon but est de m'améliorer le plus possible.
My goal is to improve as much as possible.

Je cherche à faire mieux que d'habitude.
I am striving to do better than I usually do.

Je cherche à faire mieux qu'auparavant.
I am striving to do better than before.

Other-Approach Goals:

Je cherche à faire mieux que les autres.
I am striving to do better than others.

Mon but est d'être meilleur(e) que les autres.
My goal is to perform better than others.

Je cherche à obtenir de meilleurs résultats que les autres.
I am striving to get better results than others.

Task-Avoidance Goals:

> Je m'efforce de ne pas mal comprendre les consignes.
> *I am striving not to misunderstand the instructions.*

> Je m'efforce de ne pas mal faire les choses.
> *I am striving not to do things badly.*

> Je cherche à ne pas faire les choses à moitié.
> *I am striving to avoid doing things incompletely.*

Self-Avoidance Goals:

> Mon but est d'éviter de faire moins bien que d'habitude.
> *My goal is to avoid doing less well than I usually do.*

> Je cherche à ne pas faire moins bien que mon niveau habituel.
> *I am striving not to do less well than my usual level.*

> Je cherche à ne pas faire moins bien qu'auparavant.
> *I am striving not to do less well than before.*

Other-Avoidance Goals:

> Mon but est de ne pas être surpassé(e) par les autres.
> *My goal is to avoid being outperformed by others.*

> Je cherche à éviter d'être en-dessous des autres.
> *I am striving to avoid being inferior to others.*

> Mon but est d'éviter d'être moins fort(e) que les autres.
> *My aim is to avoid being less good than others.*

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2   Table 1

3   *Fit Indices for the Four Competing Models (n =439)*

Models	χ^2/df	CFI	TLI	RMSEA	LO90	HI90	AIC
A. 6-goal model	2.36	.95	.92	.056	.047	.064	421,4
B. 4-goal model	2.52	.93	.91	.059	.051	.067	445.1
C. Approach-avoidance model	11.2	.55	.42	.152	.145	.159	1610,4
D. Mastery-other model	3.86	.87	.84	.080	.073	.088	626,6

4   *Note.* CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, RMSEA = Root Mean Square Error of
5   Approximation, LO90 = Lower bound of the RMSEA's 90% confidence interval, HI90 = Upper bound
6   of the RMSEA's 90% confidence interval, AIC = Akaike Information Criterion.

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1   Table 2

2   *Descriptive Statistics, Coefficients Alpha and Correlation Matrix for the Six Goals (n = 439)*

Variables	*M*	*SD*	Coefficients Alpha	1	2	3	4	5
1. Task-Approach goals	5.86	1.01	.72					
2. Self-Approach goals	5.99	1.00	.75	.73***				
3. Other-Approach goals	3.79	1.70	.86	.14**	.15**			
4. Task-Avoidance goals	5.49	1.13	.69	.59***	.55***	.13**		
5. Self-Avoidance goals	5.29	1.28	.66	.42**	.44***	.23***	.52***	
6. Other-Avoidance goals	4.15	1.65	.80	.16**	.19***	.71***	.29***	.34***

3   *Note. ** p < .01; *** p < .001.*

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2   Table 3

3   *Fit Indices for Factorial Invariance Tests across Gender of the 6-goal Structure of the FAGIQ-6 (n =317).*

Models	χ^2	df	χ^2/df	CFI	TLI	RMSEA	AIC	Comparison Models	$\Delta\chi^2$	Δdf	Δp
1. Unconstrained	496.80	240	2.07	.92	.90	.049	772,80				
2. Measurement Weights	509.35	252	2.02	.92	.91	.048	761,35	1	12.55	12	.40
3. Structural Covariances	541.47	273	1.98	.92	.91	.047	751,47	2	32.12	21	.06
4. Measurement Residuals	568.09	291	1.95	.92	.91	.047	742,09	3	26.62	18	.09

4   *Note.* CFI = Comparative Fit Index, TLI = Tucker-Lewis Index, RMSEA = Root Mean Square Error of Approximation,

5   AIC = Akaike Information Criterion, Δ = Difference.

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1   Table 4

2   *Types of Achievement Goal Involvement as Predicted by Potential Antecedents and as Predictors of Potential Consequences*
3   *(n = 317)*

Types of Goal Involvement	Potential Antecedents of Types of Goal Involvement			Potential Consequences of Types of Goal Involvement		
	Entity Theory of Ability	Incremental Theory of Ability	Perceived Competence	Intrinsic Motivation	Task Absorption	Anxiety
TAp	-.02	.27***	.15**	.21**	.26***	.07
SAp	.00	.14*	.11*	.17*	.21**	.09
OAp	.17**	-.01	.16**	.16**	-.02	-.02
TAv	.06	.26***	.12*	.14*	.12	.07
SAv	.05	.12*	.05	-.01	-.04	.04
OAv	.23***	.01	.09	.04	-.08	.24***

4   *Note.* TAp: Task-Appoach, SAp: Self-Approach, OAp: Other-Approach, TAv: Task Avoidance, SAv: Self-Avoidance, and
5   OAv: Other-Avoidance. The values are the standardized coefficients of regression (β) obtained when each type of
6   achievement goal involvement was regressed on potential antecedents (i.e., implicit theories of ability and perceived
7   competence) and when each potential consequence (i.e., intrinsic motivation, task absorption, and anxiety) was regressed on
8   all types of achievement goal involvement. * $p < .05$; ** $p < .01$; *** $p < .001$.

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