Empirical study

The socialization of performance goals

Nicolas Sommet [a], Vincent Pillaud [a], Bart Meuleman [b], Fabrizio Butera [a,*]

[a] Laboratoire de Psychologie Sociale (UNILaPS), Université de Lausanne, Switzerland
[b] Centre for Sociological Research, University of Leuven, Belgium

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ABSTRACT

How are competitive goals transmitted over time? As most competence-relevant contexts (e.g., school) are hierarchy-relevant (e.g., teacher/students), supervisors' performance-approach goals (desire to outperform others) should play a major role. We formulated a performance goals socialization hypothesis: The higher a supervisor's performance-approach goals, the stronger the effects of time on followers' performance-approach and -avoidance (desire *not to be* outperformed by others) goals. Study 1, involving coaches and their soccer players, showed that indeed a performance goals socialization *phenomenon* exists. Study 2, involving thesis supervisors and their Ph.D. students, showed its *consequences*: performance goals socialization reduced subordinates' motivation and well-being over time. Study 3, involving video game team leaders and their players, showed its *enabling condition*: the stronger the subordinates' identification to their team, the more pronounced the performance goals socialization. Study 4, involving schoolteachers and their pupils, showed its *directional moderator*: the higher the subordinates' perceived self-competence, the higher the change in performance-*approach* goals over time, and the lower that in performance-*avoidance* goals. It is then crucial to consider social hierarchy when studying goal formation.

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1. Introduction

Asserting one's competence relative to others is one of the most deeply rooted goals in the Western world. From university laboratories (Hirsch, 2005) to sports fields (Grehaigne, Godbout, & Bouthier, 1997), performance-approach goals are culturally promoted (Kasser, Cohn, Kanner, & Ryan, 2007). Yet, these goals also have some social costs, as they have been linked to academic dishonesty (Murdock & Anderman, 2006) or moral disengagement in sporting activity (Kavussanu, 2006). We are then left to wonder how performance goals could be reproduced. We argue that group supervisors are agents of goals socialization in achievement settings: The more supervisors pursue performance-approach goals, the more their subordinates will develop performance-based goals over time. In this article, we use the general term supervisor (the agent of socialization) and subordinate (the target of socialization) to encompass various forms of hierarchical relations in educational (here, an amateur sports club, a university, and a school) and non-educational (a video-game tournament) settings.

1.1. The performance goals socialization phenomenon

Achievement goals are social-cognitive mental frames that guide individuals in interpreting, processing, and coping with competence-relevant situations (Kaplan & Flum, 2010). The first generation of achievement goals research distinguished mastery goals (the orientation toward the *acquisition* of competences) from performance goals (the orientation toward the *demonstration* of competences; Dweck, 1986), whereas the second generation differentiated performance-*approach* goals (the desire to outperform others) from performance-*avoidance* goals (the desire not to be outperformed by others; Elliot, 1999).[1]

Past research mostly focused on *subordinates*, be they pupils, employees, or athletes (see Elliot, McGregor, & Gable, 1999; Halvari & Kjormo, 1999; Van Yperen, 2003, respectively). It was shown that subordinates' achievement goals are both stable traits (Elliot & Thrash, 2002) and transient states (e.g., as shaped by perceptions of learning environment, Anderman & Anderman, 1999). Hence, it is possible to track changes in mastery,

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* Corresponding author at: Université de Lausanne – ISS-SSP, Geopolis, CH 1015 Lausanne, Switzerland.
E-mail address: fabrizio.butera@unil.ch (F. Butera).

[1] Following generations of achievement goals research have additionally differentiated mastery-*approach* from mastery-*avoidance* goals (a 2 × 2 framework, Elliot & McGregor, 2001) and *task*-based mastery goals from *self*-based mastery goals (*task*- vs. *self*-goals; a 3 × 2 framework, Elliot, Murayama, & Pekrun, 2011). As in this research we mostly focus on performance goals, we do not get into the details of these various distinctions.

performance-approach, and performance-avoidance goals over time (Corker, Donnellan, & Bowles, 2013; Fryer & Elliot, 2007; Muis & Edwards, 2009). Although scholars have studied some predictors of change in individuals' achievement goals (e.g., exam performance; Senko & Harackiewicz, 2005), they overlooked the dynamics involved by the hierarchical nature of their social environment.

Supervisors' mastery and performance-approach goals have been defined isomorphically to those of subordinates, that is, respectively, as a will to improve their professional competences and as a will to outperform other supervisors (for teachers, see Butler, 2007; for employers, Dragoni, 2005; for coaches, Stephens, 2000). To date the level-1 (i.e., subordinates) and level-2 (i.e., supervisors) streams of achievement goals research have progressed independently of each other. Although no published studies have addressed the issue of supervisors-to-subordinates transmission of achievement goals over time, two sets of indirect evidence suggest that such a phenomenon could occur: (i) classroom goal structure; (ii) achievement goal contagion.

On the one hand, Ames (1992) has described how educators' practices could generate mastery (*vs.* performance) classroom goal structure. Mastery-oriented instructors tend to engage in mastery-oriented practices (Retelsdorf & Günther, 2011) and trigger the emergence of subordinates' mastery goals over time (Patrick, Kaplan, & Ryan, 2011). Performance-approach-oriented instructors tend to engage in performance-oriented practices and trigger the emergence of subordinates' performance-approach *and* -avoidance goals over time (Church, Elliot, & Gable, 2001).

On the other hand, Eren (2009) developed a model of achievement goal contagion, whereby learners might infer and endorse the goals of their instructors over time. Thus, students could read their teacher's performance-approach goals via external cues. Then, they would come to endorse performance-approach *or* performance-avoidance goals, depending on individual factors such as self-efficacy. Importantly, the author raised the possibility that "mastery goals [could not] be included in the achievement goals contagion framework" (p. 240), their expression by instructors being less salient in classroom environment.

The two aforementioned lines of research have paved the way to research on goal socialization, but are limited by two complementary issues. The work on classroom goal structure has primarily focused on subordinate-reported perceptions of supervisors rather than on supervisor-reported measures *per se* (for a similar point, see Wolters, Fan, & Daugherty, 2010). The model of achievement goal contagion is mechanistic in nature: Supervisor-to-subordinates goal contagion is conceived of as automatic. Our framework departs from this past research by offering a systematic study of the achievement goals socialization phenomenon, that is, a study of the social processes by which subordinates come to endorse the achievement goals of their supervisor.

Before we formally state our hypothesis, we need to mention three caveats. First, we do not formulate predictions for mastery goals. As previously indicated, supervisors' mastery goals might be less socially discernible for subordinates, as they rely on a self-referenced—and not socially situated—standard of competence (Elliot, 1999). Moreover, mastery goals are often expressed for social desirability reasons, with individuals reporting unreliable and overemphasized responses to gain favorable judgement (Dompnier, Darnon, & Butera, 2009). Second, powerful individuals tend to pursue unequivocal goals (Guinote, 2007), to inhibit
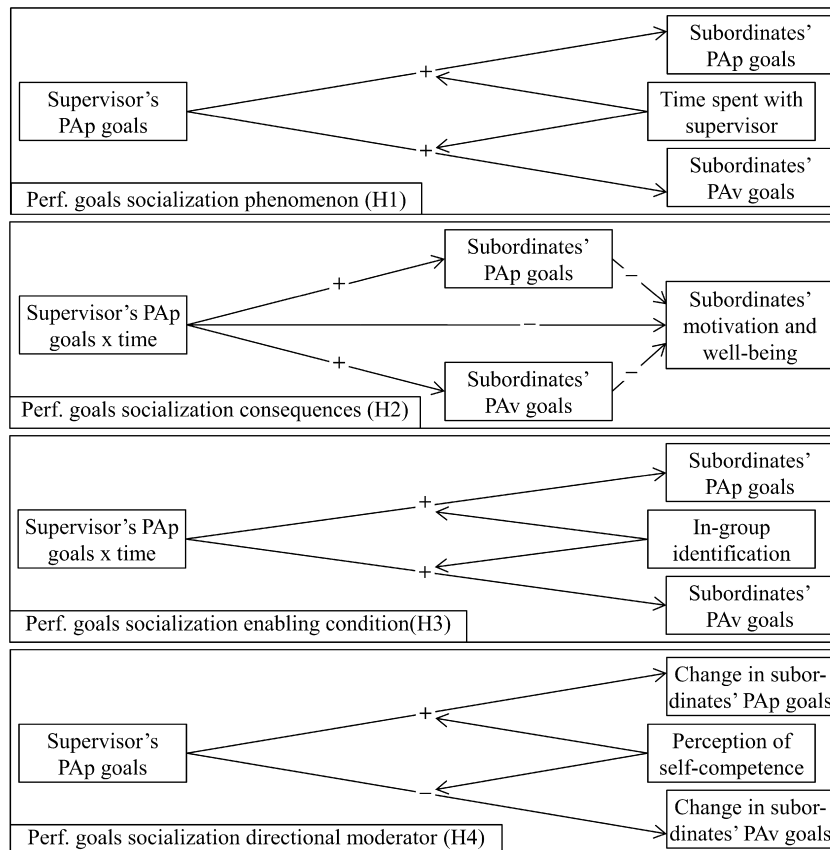

Fig. 1. Graphical representation of the socialization of performance goals (first panel from the top; Hypothesis 1a and 1b), consequences (second panel; Hypothesis 2a and 2b), enabling condition (third panel; Hypothesis 3a and 3b), and directional moderator (fourth panel; Hypothesis 4a and 4b). PAp stands for performance-approach and PAv for performance-avoidance.

alternative goals (Slabu & Guinote, 2010), and to resist others' (goals) influence (Galinsky, Magee, Gruenfeld, Whitson, & Liljenquist, 2008). Although group socialization is generally conceived as a mutual influence process, supervisors have more influence on their subordinates than the reverse (for a relevant review, see Feldman, 1994). Thus, it is reasonable to assume that supervisors pursue goals that are *relatively* unaffected by the social environment and remain constant over time. Third, holding a position of power is associated with the activation of the behavioral approach system (Keltner, Gruenfeld, & Anderson, 2003), with a sensitivity to rewards rather than to threats (Smith & Bargh, 2008), and with the endorsement of *approach* rather than avoidance goals (Willis & Guinote, 2011). As a matter of fact, leaders tend to have lower performance-avoidance goals than performance-approach goals (for an illustration, see Hendricks & Payne, 2007). Thus, supervisors' performance-avoidance goals are not considered in the present research.

Given the reviewed literature and the above caveats, we formulate a general performance goals socialization hypothesis and its corollary, tested in Study 1 (for a graphical representation, see Fig. 1, first panel from the top): The higher a supervisor's performance-approach goals, the stronger the effects of the time on subordinates' performance-approach goals (Hypothesis 1a) and, by extension, on performance-avoidance goals (Hypothesis 1b).

1.2. The consequences of performance goals socialization

Performance-approach and -avoidance goals may have detrimental consequences over time. Performance-approach goals are associated in the long run with lower reports of motivation for low-achievers (Harackiewicz, Barron, Tauer, & Elliot, 2002), a shortage of salesmen's efforts (VandeWalle, Brown, Cron, & Slocum, 1999), or a lack of involvement in sport trainees (Papaioannou, Bebetsos, Theodorakis, Christodoulidis, & Kouli, 2006). Likewise, performance-avoidance goals are associated in the long run with students' dissatisfaction (Tuominen-Soini, Salmela-Aro, & Niemivirta, 2012), workers' progressive disinterest in their job (Tanaka, Okuno, & Yamauchi, 2013), or athletes' exacerbated focus over mistakes (Stoeber, Stoll, Pescheck, & Otto, 2008). These studies suggest that students', workers', and athletes' performance-based goals predict a decrease in their motivation or well-being. We argue that such a decline could stem from supervisors' performance-approach goals.

Only a few studies adopted a cross-level perspective when testing the effects of supervisors' achievement goals on subordinate-related outcomes. Preenen, Van Vianen, and De Pater (2014) showed that managers' performance-approach goals were negatively related to their employees' experience of challenge while being assigned a task. Barić (2007) reported that coaches' performance-approach goals were negatively associated to their players' investment and enjoyment. Franklin, Porter, and Swider (2013) showed that leaders' performance-approach goals negatively predicted team task commitment. These studies provide preliminary evidence that supervisors' performance-approach goals may negatively predict subordinates' motivation or well-being. We argue that such a negative influence might be accounted for by performance goals socialization.

Thus, we formulate an exploratory hypothesis and its corollary, examined in Study 2 (for a graphical representation, see Fig. 1, second panel from the top): A supervisor's performance-approach goals may predict the evolution of subordinates' pattern of motivation and well-being over time, through the emergence of subordinates' performance-approach goals (Hypothesis 2a) and, by extension, performance-avoidance goals (Hypothesis 2b).

1.3. The enabling condition of performance goals socialization

Socialization is the process by which individuals acquire the values, attitude, and goals present in one's group (Moreland & Levine, 1982). A series of studies suggested that group supervisors might be agents of socialization. Newcomb (1943) reported that professors contribute to the progressive increase in the liberal attitudes of their students, and their maintenance over the course of the lifespan (25 years after: Newcomb, Koenig, Flacks, & Warwick, 1967; 50 years after: Alwin, Cohen, & Newcomb, 1991). Grojean, Resick, Dickson, and Smith (2004) discussed the fact that managers can relay specific ethical norms and transmit individualistic values to their followers. Steinfeldt et al. (2011) showed that coaches convey masculinity values, such as competitiveness, to their players.

Self-categorization theory describes the three steps involved in such socialization processes (Turner, Hogg, Oakes, Reicher, & Wetherell, 1987; for an historical review, see Hornsey, 2008). First, individuals categorize themselves as members of a particular social group (e.g., a pupil identify with his/her class). Second, individuals recognize the typical values, attitudes, or goals of their group (e.g., a pupil notice that competition is valued in his/her class). Third, individuals internalize these values, attitudes, or goals (e.g., a pupil embrace the competitive values of his/her class). Thus, self-categorization as a group member (or social identification) is the first and foremost condition for the acquisition and the internalization of group-based values, attitudes, and goals. Accordingly, when one identifies with his/her group, socialization is more likely to arise (Terry & Hogg, 1996). For instance, from the first to the fourth year of their training program, military students who strongly identified as military officers were found to espouse the group-based dominant beliefs, whereas military students who weakly identified as officers tended to maintain their own beliefs (Guimond, 2000). Likewise, employees with a high organizational identification are more likely to embody the same values and goals as their managers than those with a low organizational identification (Martin & Epitropaki, 2001).

Thus, we argue that supervisor-to-subordinates transmission of performance-based goals corresponds to the same process as any supervisor-based socialization. Subordinates' in-group identification is posited to be the enabling condition of the recognition (and integration) of supervisors' performance-approach goals. As in prior work on socialization, social identification is therefore conceived as a moderating variable: With time, high-identifiers should be more likely than low-identifiers to endorse the goals of the agent of socialization (see Gatto, Dambrun, Kerbrat, & De Oliveira, 2010; McAuliffe, Jetten, Hornsey, & Hogg, 2003; Wenzel, 2004). Thus, we formulate a moderation hypothesis and its corollary, tested in Study 3 (for a graphical representation, see Fig. 1, third panel from the top): Over time, the higher subordinates' group identification, the stronger the effects of supervisor's performance-approach goals on subordinates' performance-approach goals (Hypothesis 3a) and, by extension, performance-avoidance goals (Hypothesis 3b).

1.4. The direction of performance goals socialization

Elliot and Church (1997) showed that high competence expectancies were an antecedent of performance-approach goals, whereas low competence expectancies were an antecedent of performance-avoidance goals. More recently, Law, Elliot, and Murayama (2012) reported that when perceived competence is high, performance-approach goals are pursued unencumbered by performance-avoidance goals, whereas when perceived competence is low, performance-approach and performance-avoidance goals tend to be pursued simultaneously. In the same vein, Senko

and Harackiewicz (2005, Study 1) reported that high exam performance (i.e., a positive competence feedback) was associated with a subsequent increase in performance-approach goals, whereas poor early exam performance (i.e., a negative competence feedback) was associated with a subsequent increase in performance-avoidance goals (see also Jagacinski, Kumar, Boe, Lam, & Miller, 2010).

A series of arguments led us to think that perceived self-competence could determine whether performance goals socialization results in strengthening performance-approach or performance-avoidance goals. Wolters (2004) showed that the perception of classroom performance goals structure is positively associated with the emergence of *both* performance-approach and -avoidance goals. Moreover, Urdan and Schoenfelder (2006) suggested that students embedded in such a structure and who are confident in their ability should develop performance-approach goals, whereas students who doubt their ability should develop performance-avoidance goals. Likewise, Murayama and Elliot (2012a, 2012b) showed that structural and perceived competition increase concerns about one's normative standing and that individuals regulate these concerns by pursuing performance-approach and performance-avoidance goals. They also suggested that perceived competence could operate as a moderator: Individuals perceiving themselves as being sufficiently competent to face the demand of competition appraise the situation as a challenge and should endorse performance-approach goals; conversely, individuals perceiving themselves as being insufficiently competent appraise the situation as a threat and should endorse performance-avoidance goals.

As supervisors' performance-approach goals create a social environment conducive to competition, it is legitimate to think that subordinates perceiving themselves as *competent* may come to endorse performance-approach goals (winning the competition), whereas those perceiving themselves as *incompetent* may come to endorse performance-avoidance goals (not losing the competition). Thus, we formulate a fourth, second-order interaction hypothesis and its corollary, tested in Study 4 (see Fig. 1, fourth panel from the top): Over time, the higher subordinates' perceived self-competence, the stronger the effect of supervisor's performance-approach goals on subordinates' performance-approach goals (Hypothesis 4a) and, by extension, the weaker the effect on subordinates' performance-avoidance goals (Hypothesis 4b).

2. Study 1. Coaches and soccer players

2.1. Method

2.1.1. Participants and procedure

One hundred and fifty-eight players of Swiss amateur soccer teams and their 14 coaches filled in a questionnaire prior to their weekly training session. Five players were excluded due to missing data and two others due to impossibly extreme values on the time variable. The final sample consisted of $N = 151$ players (level 1: 140 men and 11 women; $M_{age} = 22.66$, $SD = 10.17$) nested in $K = 14$ male coaches (level 2: $M_{age} = 40.9$, $SD = 14.5$; seniority, $M = 3$ years, $SD = 2.53$; $n = 10.8$ players per coach, $min = 5$, $max = 16$).

2.1.2. Measures
2.1.2.1. Coaches' achievement goals (level 2). From 1 ("*not at all*") to 7 ("*completely*"), coaches answered six items, extracted from Elliot and McGregor's (2001) Achievement Goal Questionnaire (AGQ; validated in French by Darnon & Butera, 2005). Items were adapted to fit the domain of sport. Three items measured mastery-approach goals (e.g., "When I coach my team, I want to improve my training

methods as much as possible"; $\alpha = 0.84$, $M = 6.26$, $SD = 1.23$) and three measured performance-approach goals (e.g., "When I coach my team, it is important for me to do better than other coaches"; $\alpha = 0.89$, $M = 4.14$, $SD = 2.01$).

2.1.2.2. Soccer players' achievement goals (level 1). Using the same response scale, players also answered items adapted from the AGQ. Three items measured mastery-approach goals (e.g., "When I play soccer, I want to learn the sport techniques as much as possible"; $\alpha = 0.80$, $M = 5.67$, $SD = 1.32$, $sk = -1.00$), three measured performance-approach goals (e.g., "When I play soccer, it is important for me to play better than the players of the other teams"; $\alpha = 0.74$, $M = 5.58$, $SD = 1.30$, $sk = -1.19$),[2] and three measured performance-avoidance-goals (e.g., "When I play soccer, I just want to avoid playing poorly; 0.60, $M = 4.57$, $SD = 1.42$, $sk = -0.36$).

2.1.2.3. Number of years under the supervision of the coach (level 1). In an open-ended question, players reported "the date from which [they] have been playing with [their] actual coach." The variable was transformed in number of years ($M = 1.68$, $SD = 2.16$).[3] We refer to this variable as "time." We use this label invariably across studies.

2.2. Results

Predictors, coefficient estimates, and confidence interval are presented in Table 1.

2.2.1. Multilevel modeling procedure and preliminary analysis
We aimed at testing the cross-level interaction effects between coaches' performance-approach goals and time on the three goal outcomes (players' mastery, performance-approach, and -avoidance). We built three multilevel models (one per goal outcome). Each model included the following three grand-mean centered predictors: coaches' performance-approach goals, time, and the interaction (see Supplementary Material for the details of the procedure).

Three sets of preliminary analysis were conducted. First, we tested the effects of coaches' mastery goals (no effects reached significance). Second, we tested the effects of the quadratic term of time to account for potential floor/ceiling effects (an effect was observed for performance-avoidance goals and we kept the term for this outcome). Third, we ran a complete analysis of covariance to determine the need for controlling other covariates (we decided not to keep any of them; see Supplementary Material for the details of the analysis).

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[2] For exploratory purposes, we distinguished performance-approach goals toward out-group members (i.e., desire to outperform *opponents*; as described above) from performance-approach goals toward in-group members (i.e., desire to outperform *teammates*; 3 items, e.g., "When I play soccer, it is important for me to play better than the players of *my* teams"; $\alpha = 0.83$, $M = 4.60$, $SD = 1.57$). The former corresponds to performance-approach goals as classically conceptualized in achievement goals research in sport (see for instance, Sage, Kavussanu, & Duda, 2006). The latter form—to the best of our knowledge—has not been clearly conceptualized in the literature. Neither coaches' performance-approach, $B = -0.04$ [-0.33, 0.25], $Z < |1|$, $p = 0.806$, nor the interaction between coaches' performance-approach and time, $B = -0.01$ [-0.05, 0.02], $Z < |1|$, $p = 0.546$, were significantly different from zero. Thus, this variable was not further considered in the present manuscript.

[3] The fact that the standard deviation of the variable was superior to its mean indicated a large dispersion of individual responses. Specifically, data showed a highly right-skewed distribution ($sk = 2.99$) increasing the likelihood of outlier(s) being present. Using the interquarile method, with a conservative cut-off of $Q_1 - 3 * IQR < x_i < Q_3 + 3 * IQR$ (where Q_1 is the first quartile, Q_3 the third one, and IQR the interquartile range; see Berk & Carey, 2009), we detected six potential influential observations. However, as excluding them did not change the patterns of results (all hypothesized interaction effects remained significant at $p < 0.01$), they were retained for the reported analyses.

Table 1
Coefficient estimates and confidence intervals for the models testing the effects of coaches' performance-approach goals and time on players' achievement goals (Study 1).

			Players' mastery goals		Players' performance-approach goals		Players' performance-avoidance goals	
			B	CI	B	CI	B	CI
Level 1	Intercept, B_{00}		5.61^{***}	[5.19, 6.03]	5.60^{***}	[5.35, 5.85]	4.53	[4.06, 5.01]
	Time spent in the team – linear (Tl_{ij}), B_{10}		−0.04	[−0.14, 0.06]	0.00	[−0.06, 0.06]	−0.02	[−0.14, 0.11]
	Time spent in the team – quadratic (Tq_{ij}), B_{20}		–	–	–	–	0.01	[−0.01, 0.02]
Level 2	Coaches' performance-approach goals ($SPAp_j$), B_{01}		0.11	[−0.15, 0.38]	0.04	[−0.12, 0.20]	0.21	[−0.05, 0.46]
Cross-level	Linear time × performance-approach goals, B_{11}		−0.04	[−0.10, 0.03]	0.07^{***}	[0.03, 0.11]	0.07^{*}	[0.01, 0.13]
	Quadratic time × performance-approach goals, B_{12}		–	–	–	–	-0.03^{***}	[−0.04, −0.01]
Residual	Level-1 error, var(e_{ij})		1.19		0.08		0.60	
	Level-2 error, var(u_{0j})		0.47		1.48		1.21	
	Intraclass correlation		0.28		0.05		0.33	

Note: The equation of the cross-level interaction model is $Y_{ij} = B_{00} + B_{10} * Tl_{ij} + B_{20} * Tq_{ij} + B_{01} * SPAp_j + B_{11} * Tl_{ij} * SPAp_j + B_{12} * Tq_{ij} * SPAp_j + u_{0j} + e_{ij}$.
*** $p < 0.001$.
* $p < 0.05$.

2.2.2. Socialization of achievement goals

2.2.2.1. Players' mastery goals. No effect reached significance ($ps \geq 0.25$).

2.2.2.2. Players' performance-approach goals. Consistent with Hypothesis 1a, the interaction was significant, $B = 0.07$, 95% CI [0.03, 0.11],[4] $Z = 3.71$, $p < 0.001$. As reported in Fig. 2 (left panel), time was more positively associated with subordinates' performance-approach goals when coaches' performance-approach goals were high, $B = 0.15$, [0.09, 0.21], $Z = 5.04$, $p < 0.001$, than when they were low, $B = −0.14$ [−0.27, −0.02], $Z = −2.22$, $p = 0.026$.

2.2.2.3. Players' performance-avoidance goals. In line with Hypothesis 1b, the interactions between coaches' performance-approach goals and time were significant for the linear term, $B = 0.07$ [0.01, 0.13], $Z = 2.32$, $p = 0.02$, and for the quadratic term, $B = −0.03$ [−0.04, −0.01], $Z = −3.33$, $p < 0.001$. As reported in Fig. 2 (right panel), time was more positively associated with subordinates' performance-avoidance goals when coaches' performance-approach goals were high (for the linear term: $B = 0.14$ [−0.10, 0.37], $Z = 1.15$, $p = 0.25$; for the quadratic term: $B = −0.05$ [−0.09, −0.01], $Z = −2.62$, $p = 0.009$) than when they were low (for the linear term: $B = −0.17$ [−0.28, −0.06], $Z = −2.95$, $p = 0.003$; for the quadratic term: $B = 0.06$ [0.03, 0.10], $Z = 3.59$, $p < 0.001$).

2.3. Discussion

In line with Hypothesis 1a, Study 1 showed that the higher the supervisors' performance-approach goals (in this case, coaches), the stronger the effect of time on subordinates' performance-approach goals (in this case, soccer players). In line with Hypothesis 1b, results revealed the same phenomenon for subordinates' performance-avoidance goals, notwithstanding the intervention of a floor effect (for supervisors endorsing low performance-approach goals) and a ceiling effect (for supervisors endorsing high performance-approach goals). This unexpected polynomial interaction suggests a somehow faster performance goals socialization for performance-avoidance goals (reaching their minimum/maximum more rapidly than performance-approach goals). Moreover, achievement goals socialization was only found for performance goals: Supervisors' mastery goals did not significantly interact with time in predicting soccer players' mastery, performance-approach or performance-avoidance goals.

Given the cross-sectional nature of Study 1, we cannot rule out the possibility that the results are (partially) due to a (self-) selection process rather than a socialization process: When having a different level of performance-based goals than supervisors, subordinates may be excluded from (or leave) the group (see Bachman, Sigelman, & Diamond, 1987). This issue is addressed in Study 4. Additionally, two limitations point out the need for replication. First, while sample size at level 1 was satisfactory, at level 2, it was low. Second, Study 1 took place in a sport setting. Given that the processes of achievement goals socialization was not expected to depend on the achievement domain, Study 2 aimed to replicate Study 1's findings within more numerous *academic* groups, while also exploring Hypotheses 2a and 2b.

3. Study 2. Thesis supervisor and Ph.D. students

3.1. Method

3.1.1. Participants and procedure

Seventy-nine Ph.D. students of two Swiss universities (Social and Technical Sciences) and their 41 thesis supervisors filled in an online questionnaire. Eight Ph.D. students were excluded due to missing data and another one was identified as an outlier.[5] The final sample consisted of $N = 70$ students (level 1: 37 social sciences students and 33 technical sciences students; 45 men and 25 women; $M_{age} = 28.39$, $SD = 3.61$) nested in $K = 41$ thesis supervisors (level 2: 38 men and 3 women; $n = 1.7$ students per supervisor, $min = 1$, $max = 5$).

3.1.2. Measures

3.1.2.1. Thesis supervisors' achievement goals (level 2). As in Study 1, thesis supervisors answered items adapted from the AGQ. This time, items were adapted to fit the academic domain. Three items measured mastery-approach goals (e.g., "In my research work, I want to learn as much as possible about my subject"; $\alpha = 0.89$, $M = 6.49$, $SD = 0.56$) and three measured performance-approach goals (e.g., "In my research work, my goal is to have more publications than most other researchers"; $\alpha = 0.81$, $M = 3.76$, $SD = 1.22$).

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[4] Thereafter the ", 95% CI" is omitted. All square brackets therefore indicate a 95% confidence interval.

[5] We conducted a series of preliminary diagnostic analysis in order to detect potential influential observations. DFFITS values—providing a measure of how deleting a particular observation modifies regression results—were calculated. For one observation, they were found to be above the cutoff point (i.e., |DFFITS| > $2 * \sqrt{(k/n)}$, where k is the number of regressors, and n the number of observations; Fidell & Tabachnick, 2003) for both performance-approach and -avoidance goals. Respective DFFITS values were of 0.41 and 0.43. In keeping the participant, the interaction effects hypothesized in 1a and 1b remained significant ($ps < 0.045$). In removing it, they became clearer ($ps < 0.026$).
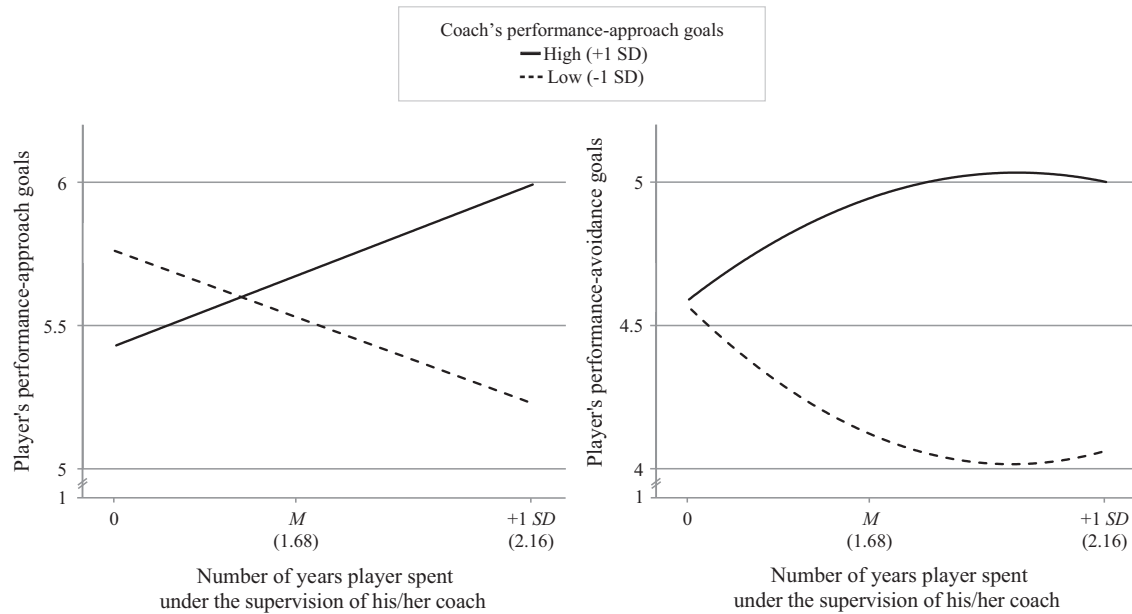
Fig. 2. Players' performance-approach (left panel) and -avoidance (right panel) goals as a function of coaches' performance-approach goals and number of years players spent under the supervision of the coach. Study 1.

3.1.2.2. Ph.D. students' achievement goals (level 1). Ph.D. students also answered items adapted from the AGQ. Three items measured mastery-approach goals (e.g., "In my thesis work, I want to learn as much as possible about my subject"; $\alpha = 0.53$,[6] $M = 6.52$, $SD = 0.50$, $sk = 0.18$), three measured performance-approach goals (e.g., "In my thesis work, it is important for me to do better than other Ph.D. students"; $\alpha = 0.92$, $M = 3.34$, $SD = 1.51$, $sk = -0.83$) and three measured performance-avoidance-goals (e.g., "In my thesis work, I just want to avoid doing poorly"; $\alpha = 0.72$, $M = 3.46$, $SD = 1.44$, $sk = -0.01$).

3.1.2.3. Number of years spent under the supervision of the director (level 1). In an open-ended question, Ph.D. students reported "when did [they] start [their] Ph.D.," which was transformed in number of years ($M = 2.42$, $SD = 1.49$).

3.1.2.4. Ph.D. students' intention to drop out of thesis. From 1 ("*not at all*") to 7 ("*completely*"), students answered two items (e.g., "I often think about quitting my thesis in a near future"; $\alpha = 0.55$, $M = 2.29$, $SD = 1.37$, $sk = -0.74$), extracted from the Michigan Organizational Assessment Questionnaire (Cammann, Fichman, Jenkins, & Klesh, 1983).

3.1.2.5. Ph.D. students' satisfaction. From 1 ("*not at all*") to 7 ("*completely*"), Ph.D. students answered the five items of the Bacharach, Bamberger, and Conley's (1991) Job Satisfaction Scale (e.g., "In my thesis, I am satisfied of my research work in light of my career expectations"; $\alpha = 0.82$, $M = 4.86$, $SD = 1.14$, $sk = 0.75$).[7]

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[6] For mastery goals, the low alpha value results from the low variance in participant responses (n.b., less than 8% of the items responses were different than 6 or 7; for a similar problem, see Darnon, Dompnier, Delmas, Pulfrey, & Butera, 2009).

[7] Given the exploratory nature of the present study, two additional variables were measured: (i) seven items assessed the quality of leader-member exchange (e.g., "My working relationship with my thesis supervisor is effective"; $\alpha = 0.93$, $M = 5.63$, $SD = 1.22$; Janssen & Van Yperen, 2004); (ii) nine items assessed creativity "How often do you create new ideas for improvement in your work?"; $\alpha = 0.88$, $M = 3.68$, $SD = 0.94$; Janssen, 2000). However, as the interaction effects between students spent with their supervisors and thesis supervisors' performance-approach goals on both of these outcomes were non-significant, detailed results were neither presented nor discussed.

3.2. Results

3.2.1. Replication of Study 1's findings

Predictors, coefficient estimates, and confidence intervals are presented in Table 2.

3.2.1.1. Multilevel modeling procedure and preliminary analysis. Again, we aimed at testing the cross-level interaction effects between thesis supervisors' performance-approach goals and time on the three goal outcomes. As the intraclass coefficient correlations and the between-cluster variations of the effect of time were not significantly different from zero, we built three standard regression models with standard errors adjusted for clustering (one per goal outcome). Each model included the following four grand-mean centered predictors: coaches' performance-approach goals, time, the interaction, as well as university affiliation (to account for potential sample effects; coded "−0.5" for "Social Science" and "+0.5" for "Technical Science"; see Supplementary Material for the details of the procedure).

Two sets of preliminary analyses were conducted. First, we tested the effects of coaches' mastery goals (no effect reached significance). Second, we ran a complete analysis of covariance to determine the need for controlling other covariates (no effect reached significance; see Supplementary Material for the details of the analysis).

3.2.1.2. Ph.D. students' mastery goals. No effect reached significance ($p\text{s} \geq 0.31$).

3.2.1.3. Ph.D. students' performance-approach goals. Consistent with Hypothesis 1a, the interaction between supervisors' performance-approach goals and time was significant, $B = 0.20$ [0.03, 0.38], $Z = 2.26$, $p = 0.024$ (*a1* path in Fig. 3). As in Study 1, time was more positively associated with subordinates' performance-approach goals when supervisors' performance-approach goals were high, $B = 0.20$ [−0.10, 0.49], $Z = 1.30$, $p = 0.195$, than when they were low, $B = -0.30$ [−0.64, 0.05], $Z = -1.68$, $p = 0.093$.

3.2.1.4. Ph.D. students' performance-avoidance goals. Consistent with Hypothesis 1b, the interaction between supervisors'

Table 2
Coefficient estimates and confidence intervals for the models testing the effects of thesis supervisors' performance-approach goals and time on players' achievement goals (Study 2).

		Students' mastery goals		Students' performance-approach goals		Students' performance-avoidance goals	
		B	CI	B	CI	B	CI
Level 1	Intercept, B_{00}	6.52[***]	[6.39, 6.65]	3.41[***]	[3.05, 3.78]	3.51[***]	[3.19, 3.83]
	Time spent in the group (T_{ij}), B_{10}	0.01	[−0.07, 0.09]	−0.05	[−0.29, 0.19]	−0.08	[−0.28, 0.11]
	University affiliation (Aff_{ij}), B_{20}	0.11	[−0.16, 0.38]	−0.12	[−0.83, 0.60]	−0.38	[−1.09, 0.32]
Level 2	Supervisors' perf.-approach goals ($SPAp_j$), B_{01}	0.05	[−0.05, 0.16]	−0.28	[−0.62, 0.06]	−0.20	[−0.46, 0.06]
Cross-level	Time × performance-approach goals, B_{11}	−0.01	[−0.06, 0.04]	0.20[*]	[0.03, 0.38]	0.15[**]	[0.04, 0.26]
Residual	Residual error, var(e_{ij})	0.24		2.08		1.94	

Note: The equation of the maximum likelihood regression model with standard errors adjusted for clustering is $Y_{ij} = B_{00} + B_{10} * T_{ij} + B_{20} * Aff_{ij} + B_{01} * SPAp_j + B_{11} * Tl_{ij} * SPAp_j + e_{ij}$.
[***] $p < 0.001$.
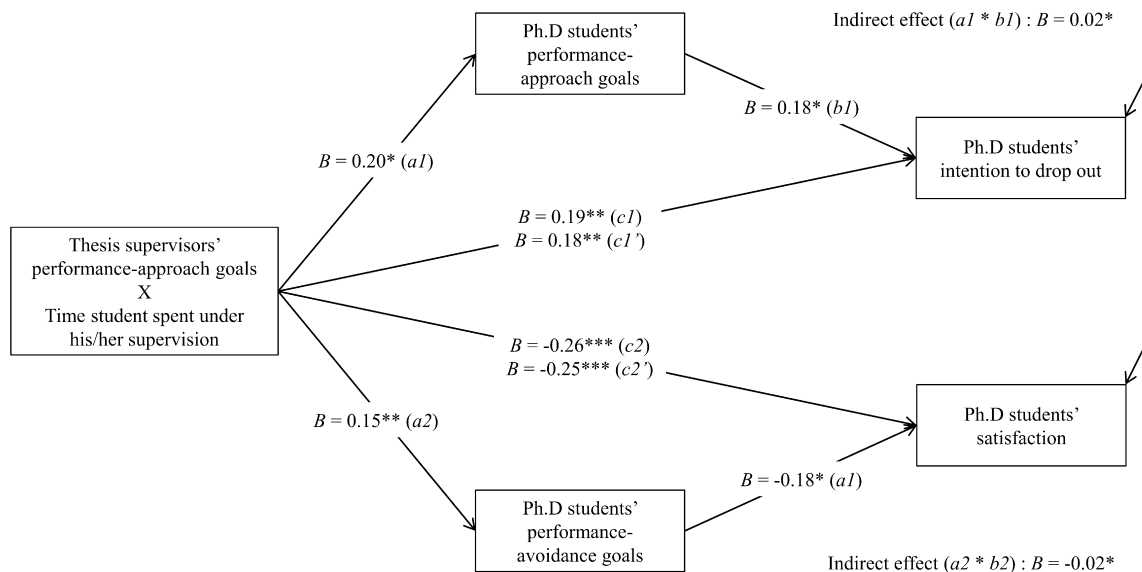[**] $p < 0.01$.
[*] $p < 0.05$.

Fig. 3. Moderation effect of thesis supervisors' performance-approach goals and time Ph.D. spent under their supervision on Ph.D. students' intention to drop out and satisfaction, through Ph.D. students' performance-approach and -avoidance goals. Study 2. *Note.* [*] $p < 0.05$, [**] $p < 0.01$, [***] $p < 0.001$.

performance-approach goals and time was significant, $B = 0.15$ [0.04, 0.26], $Z = 2.70$, $p = 0.007$ (*a2* path in Fig. 3). As in Study 1, time was more positively associated with subordinates' performance-avoidance goals when supervisors' performance-approach goals were high, $B = 0.10$ [−0.09, 0.30], $Z = 1.01$, $p = 0.31$, than when they were low, $B = −0.27$ [−0.54, 0], $Z = −1.94$, $p = 0.052$.

3.2.2. Consequences of performance goals socialization

Predictors, coefficient estimates, and confidence intervals are presented in Table 3.

3.2.2.1. Ph.D. students' intention to drop out of thesis.
3.2.2.1.1. Total effect of supervisors' performance-approach goals over time. As a first step, we aimed at exploring the consequences over time of supervisors' performance-approach goals on Ph.D. students' intention to drop out of thesis. We built a multilevel model including the same four predictors as before (see Supplementary Material for the details of the procedure). The interaction between supervisors' performance-approach goals and time was significant, $B = 0.19$ [0.05, 0.33], $Z = 2.67$, $p = 0.008$ (*c1* path in Fig. 3). As

reported in Fig. 4 (left panel), time was more positively associated with intention to drop out when supervisors' performance-approach goals were high, $B = 0.73$ [0.51, 0.94], $Z = 6.68$, $p < 0.001$, than when they were low, $B = 0.26$ [−0.01, 0.53], $Z = 1.92$, $p = 0.055$.

3.2.2.1.2. Indirect effect of supervisors' performance-approach goals through Ph.D. students' goals. As a second step, we aimed at determining the potential role of Ph.D. students' achievement goals in explaining the interaction between supervisors' performance-approach goals and time on intention to drop out. All grand-mean centered students' achievement goals and their interactions were included in the model.[8] The interaction between supervisors'

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[8] Interactions between the potential achievement goal mediators were taken into account in order to increase the predictive accuracy of our model. Past research controlled this kind of achievement goal interactions when using satisfaction- or drop out-related measures as outcomes (e.g., Janssen & Van Yperen, 2004). However, the moderation effects were not reported in the main manuscript since the focus was not on the issue of multiple goals (for a literature review on this matter, see Harackiewicz & Linnenbrink, 2005). It is worth noting that analysis revealed an interaction between Ph.D. students' mastery and performance-approach goals on both satisfaction, $B = 0.49$ [0.17, 0.80], $Z = 3.06$, $p = 0.002$, and intention to drop out, $B = −0.66$ [−0.98, −0.33], $Z = −3.97$, $p < 0.001$. No other interaction effect reached significance. The details of the results are presented in Supplementary Material (Table S3).

Table 3
Coefficient estimates and confidence intervals for the models testing the effects of thesis supervisors' performance-approach goals and time on drop out and satisfaction, without and with students' achievement goals (Study 2).

		Intention to drop out				Satisfaction			
		c1 path		b1 and c1′ paths		c2 path		b2 and c2′ paths	
		B	CI	B	CI	B	CI	B	CI
Level 1	Intercept, B_{00}	2.34***	[2.08, 2.61]	2.43***	[2.20, 2.66]	4.79***	[4.52, 5.05]	4.75***	[4.52, 4.98]
	Time spent in the group (T_{ij}), B_{10}	0.49***	[0.32, 0.67]	0.54***	[0.39, 0.70]	0.07	[−0.10, 0.24]	0.00	[−0.15, 0.15]
	University affiliation (Aff_{ij}), B_{20}	0.06	[−0.50, 0.61]	0.44†	[−0.08, 0.96]	0.30	[−0.26, 0.86]	−0.14	[−0.66, 0.38]
	Students' mast.-app. goals (MAp_{ij}), B_{30}	–	–	−0.40†	[−0.86, 0.07]	–	–	0.79***	[0.35, 1.24]
	Students' perf.-app. goals (PAp_{ij}), B_{40}	–	–	0.18*	[0.03, 0.34]	–	–	−0.03	[−0.18, 0.11]
	Students' perf.-av. goals (PAv_{ij}), B_{50}	–	–	0.03	[−0.13, 0.20]	–	–	−0.18*	[−0.33, −0.02]
Level 2	Supervisors' perf.-app. goals ($SPAp_j$), B_{01}	−0.04	[−0.28, 0.20]	0.02	[−0.19, 0.24]	0.05	[−0.19, 0.29]	−0.02	[−0.23, 0.20]
Cross-level	Time × perf.-app. goals, B_{11}	0.19**	[0.05, 0.33]	0.18**	[0.05, 0.31]	−0.26***	[−0.40, −0.13]	−0.25***	[−0.38, −0.12]
Residual	Level-1 error, var(e_{ij})	0.96	–	0.76	–	0.82	–	0.64	–
	Level-2 error, var(u_{0j})	0.13	–	0.06	–	0.22	–	0.13	–
	Intraclass correlation	0.12	–	0.08	–	0.21	–	0.17	–

Notes: The equation of the cross-level interaction model is $Y_{ij} = B_{00} + B_{10} * T_{ij} + B_{20} * Aff_{ij} + B_{30} * MAp_{ij} + B_{40} * PAp_{ij} + B_{50} * PAv_{ij} + B_{01} * SPAp_j + B_{11} * Tl_{ij} * SPAp_j + u_{0j} + e_{ij}$. The interaction effects between Ph.D. goals are not reported.
*** $p < 0.001$.
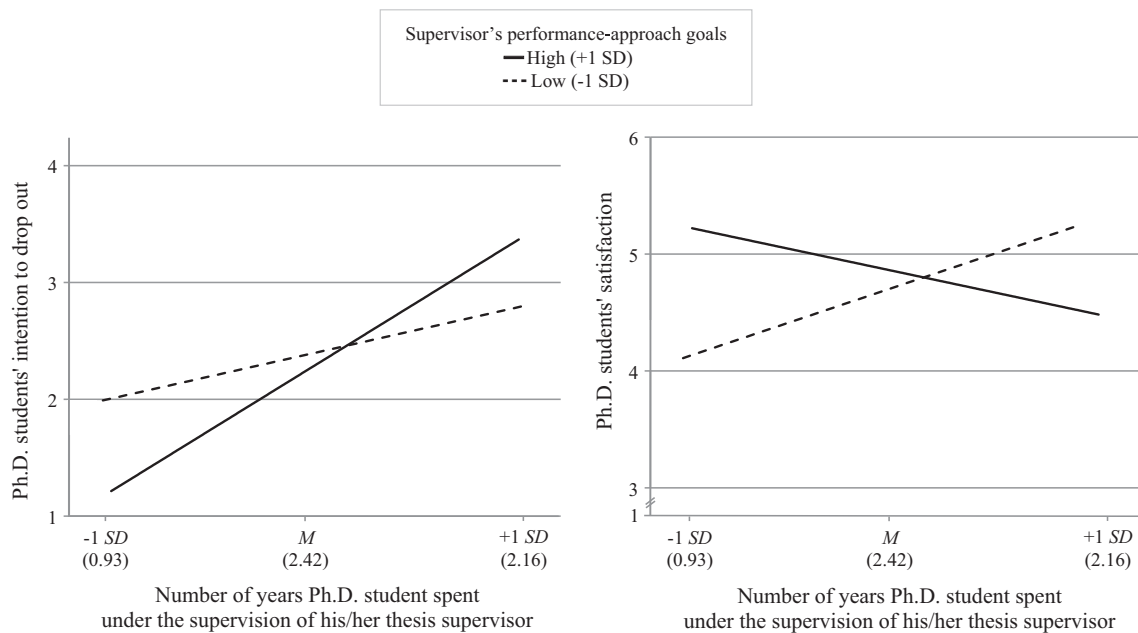** $p < 0.01$.
* $p < 0.05$.
† $p < 0.1$.

Fig. 4. Ph.D. students' intention to drop out from thesis (left panel) and satisfaction (right panel) as a function of thesis supervisors' performance-approach goals and number of years Ph.D. students spent under the supervision of the supervisor. Study 2.

performance-approach goals and time remained the same, $B = 0.18$ [0.05, 0.31], $Z = 2.71$, $p = 0.007$ (c1′ path in Fig. 3).[9] More importantly, Ph.D. students' performance-approach goals were positively associated with intention to drop out, $B = 0.18$ [0.03, 0.34], $Z = 2.37$, $p < 0.018$ (b1 path in Fig. 3). As Ph.D. students' performance-approach goals could be a good candidate in explaining the moderation effect between supervisors' performance-approach goals and time on students' intention to drop out, the indirect effect was

calculated using Monte Carlo simulations (MacKinnon, Lockwood, & Williams, 2004).[10] It was $B = 0.02$ [0.001, 0.093] (a1 * b1 path in Fig. 3).

3.2.2.2. Ph.D. students' satisfaction.
3.2.2.2.1. Total effect of supervisors' performance-approach goals over time.
In a first step, we built the same multilevel model used for intention to drop out, but this time predicting students' satisfaction (see Supplementary Material for the details of the procedure). The interaction between thesis supervisors' performance-approach

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[9] In the context of multiple mediators (i.e., here Ph.D. students' achievement goals), the reduction of total effect—i.e., the total effect (c) minus the direct effect (c′)—has poor diagnostic value. Indeed, mediator variables can interfere with each other (e.g., one of it can work as a suppressor variable, Judd, Yzerbyt, & Muller, 2014) and, accordingly, Rucker, Preacher, Tormala, and Petty (2011) recommend to "abandon the emphasis on the significance of c and c′ [in conducting mediation analyses]" (p. 368).

[10] Confidence intervals were construed using the Monte Carlo simulation (MC;) rather than the bias-corrected bootstrap method, as Preacher and Selig (2012) demonstrated that "until one bootstrap method emerges as best in the multilevel context, MC may be the only viable method [to assess indirect effect]" (p. 94).

goals and time was significant, $B = -0.26$ [−0.40, −0.13], $Z = -3.76$, $p < 0.001$ (*c2* path in Fig. 3). As it can be seen in Fig. 4 (right panel), time was more negatively associated with satisfaction when supervisors' performance-approach goals were high, $B = -0.25$ [−0.45, −0.05], $Z = -2.40$, $p = 0.016$, than when they were low, $B = 0.39$ [0.13, 0.66], $Z = 2.89$, $p = 0.004$.

3.2.2.2.2. Indirect effect of supervisors' performance-approach goals through Ph.D. students' goals. In a second step, we aimed at determining the potential role of Ph.D. students' achievement goals in explaining the interaction between thesis supervisors' performance-approach goals and time on satisfaction. All grand-mean centered Ph.D. students' achievement goals and their interactions were included in the model. The interaction between supervisors' performance-approach goals and time remained the same, $B = -0.25$, [−0.38, −0.12], $Z = -3.91$, $p < 0.001$ (*c2′* path in Fig. 3). More importantly, Ph.D. students' performance-avoidance goals were negatively associated with their satisfaction, $B = -0.18$ [−0.33, −0.02], $Z = -2.22$, $p = 0.026$ (*b2* path in Fig. 3). The indirect effect of supervisors' performance-approach goals on satisfaction via performance-avoidance goals was $B = -0.02$ [−0.061, −0.001] (*a2* * *b2* path in Fig. 3).

3.3. Discussion

Consistent with what observed in Study 1, but for a different achievement domain, Study 2 showed that the higher the supervisors' performance-approach goals (in this case, thesis supervisors), the stronger the effect of time on subordinates' (in this case, Ph.D. students) performance-approach (Hypothesis 1a) and performance-avoidance (Hypothesis 1b) goals. Contrasting with Study 1, the polynomial interaction between supervisors' performance-approach goals and time was not significant. The tighter range of our time variable might explain such an absence of floor/ceiling effect.

Beyond the replication of performance goals socialization, Study 2 provided an illustration of its consequences. First, in line with Hypothesis 2a, Study 2 showed that supervisors' performance-approach goals were directly and indirectly—through subordinates' performance-approach goals—associated with intention to drop out. These findings are consistent with the one establishing a positive relationship between performance goal climate and dropout behaviors (Sarrazin, Vallerand, Guillet, Pelletier, & Cury, 2002). However, the valence of the performance goals mediator is surprising, as individuals' performance-*approach* (vs. -*avoidance*) goals have been found to positively predict persistence (Elliot et al., 1999). This could be explained by the specificity of our participants (i.e., Ph.D. students), who are often expected to work on complex scientific material (e.g., state-of-the-art findings) in collaboration with others (e.g., with co-authors). When conducting difficult task within groups, performance-approach goals typically impair team adaptation (LePine, 2005), which could favor disengagement and dropout (Rumberger, 2001).

Second, in line with Hypothesis 2b, Study 2 showed that, over time, supervisors' performance-approach goals were directly and indirectly—through subordinates' performance-avoidance goals—associated with satisfaction. These findings are consistent with research reporting a negative relationship between performance goal climate and satisfaction (Treasure & Robert, 2001), and a negative effect of performance-avoidance goals on satisfaction (Diseth & Samdal, 2014).

Now that we have empirically defined performance goals socialization and identified (some of) its consequences, we intend to show that this phenomenon is indeed a socialization process. Since self-categorization is the prerequisite for socialization processes to occur, we expect identification to one's group to be the enabling condition of performance goals socialization. Specifically, after having spent a substantial amount of time in a group led by a performance-approach-oriented supervisor, subordinates highly (vs. poorly) identified with their group should pursue more performance-approach goals (Hypothesis 3a) and performance-avoidance goals (Hypothesis 3b). This idea was tested in another achievement setting, albeit more informal: video game teams (see Ryan, Rigby, & Przybylski, 2006).

4. Study 3. Video game team leaders and players

4.1. Method

4.1.1. Participants and procedure

Sixty-six players from 24 teams of an online multiplayer video game filled in an online questionnaire. The video game is an online first-person shooter named "Quake Live." The particularity of the teams from this game is to be hierarchically structured. Each member has an explicit status: Initiate, Member, Veteran, Clan Leader, and Clan Officer (from the lowest to the highest rank). The latter two ranks allow the players to invite new members to join the team, and to promote, demote, or exclude existing members. The Clan Officers (or Clan Leaders in the case of teams having no Clan Officer) were treated as supervisors, whereas the players having inferior ranks were treated as subordinates. Eight participants were excluded due to missing data or because they were not yet in the team at the time of data collection. The final sample consisted of $N = 33$ team-member (level 1: 32 men and 1 woman; $M_{age} = 24.09$, $SD = 4.46$) nested in $K = 25$ leaders (level 2: 24 males and 1 missing value; $M_{age} = 25.74$, $SD = 3.56$; $n = 1.4$ team-member per leader, $min = 1$, $max = 4$).[11]

4.1.2. Measures
4.1.2.1. Leaders' performance-approach goals (level 2). As in Studies 1 and 2, leaders answered items adapted from the AGQ. This time, items were adapted to fit the area of video games. Only the three items measuring performance-approach goals were considered (e.g., "When I play, I want to perform better than the other players."; $\alpha = 0.81$, $M = 5.29$, $SD = 1.16$). As in Studies 1 and 2 supervisors' and subordinates' mastery goals were not found to produce consistent results and these goals were no longer considered.

4.1.2.2. Team-members' performance goals (level 1). Team-members answered the same performance goals items as their leaders. Three items measured performance-approach goals ($\alpha = 0.56$, $M = 5.21$, $SD = 1.01$, $sk = -0.20$) and three measured performance-avoidance goals ("When I play, I want to avoid being worse than the other players."; $\alpha = 0.82$, $M = 4.71$, $SD = 1.68$, $sk = -0.65$).

4.1.2.3. Team-members' identification with their team (level 1). From 1 ("*not at all*") to 7 ("*completely*"), each team-member answered three items adapted from Falomir-Pichastor, Mugny, Invernizzi, Di Palma, and Estrada (2007); i.e., "Do you identify with your clan?"; "Do you feel close to the members of your clan?"; and "Do you think you're similar to the members of your clan?"; $\alpha = 0.85$, $M = 5.50$, $SD = 1.09$.

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[11] Two elements have to be made clear. First, one team had two Clan Officers. Performance-approach goals of these two leaders were therefore averaged. Second, eight teams had no Clan Officer. For these teams, we treated their Clan Leader (i.e., the highest remaining rank) as being the leader. In assessing the (potential) consequences of such a decision, we entered this variable in our final model (coded "−0.5" for members having a "Clan Leader" as a leader and "+0.5" for the ones having a "Clan Officer" as a leader). As the variable neither produced significant effect on team-members' performance-approach ($p = 0.427$) and -avoidance ($p = 0.806$), nor changed the pattern of the expected second-order interaction, the distinction was not further considered.

4.1.2.4. Number of months spent under the supervision of the leader (level 1). During the completion of the questionnaire, the date on which team-members joined their team was collected. This information was publicly accessible via the players' game statistics profile. The variable was transformed in number of months (M = 10.73, SD = 9.94).

4.1.2.5. Team-members' average game performance (level 1). As performance was reported as an antecedent of achievement goals (Senko & Harackiewicz, 2005) and could be confounded with the effect of leaders' performance-approach goals, team-members' average accuracy was used as a measure of performance. This measure was collected on players' game statistics profile. It was an average percentage for all games and could range from 0% (perfect inaccuracy: Each time the participant shoots, s/he misses the opponent) to 100% (perfect accuracy: Each time the participant shoots, s/he hits the opponent; M = 29.18, SD = 6.39).

4.2. Results

Predictors, coefficient estimates, and confidence interval are presented in Table 4.

4.2.1. Multilevel modeling procedure and preliminary analysis

Again, we aimed at testing (second order) cross-level interaction effects. We built two multilevel models (one per goal outcome). Each model included the following eight grand-mean centered predictors: leaders' performance-approach goals, time, team-members' identification, and the interactions (see Supplementary Material for the details of the procedure).

As in Studies 1 and 2, we ran a complete analysis of covariance to determine the need for controlling other covariates (an effect of team-members' performance was observed for both performance-based goals and we kept the term; see Supplementary Material for the details of the analysis).

4.2.2. Team-members' performance-approach goals

Consistent with Hypothesis 3a, the three-way interaction between leaders' performance-approach goals, time, and members' identification was significant, B = 0.05 [0.004, 0.09], Z = 2.13,

p = 0.033. As shown in Fig. 5 (left panel), when time was high (+1 SD), the interaction between leaders' performance-approach goals and members' identification was significant, B = 0.59 [0.02, 1.15], Z = 2.02, p = 0.043, whereas this was not the case when it was low (−1 SD), B = −0.37 [−0.81, 0.07], Z = −1.63, p = 0.103. Specifically, when time was high, leaders' performance-approach goals were more positively associated with subordinates' performance-approach goals when subordinates were highly identified (+1 SD), B = 0.41 [−0.41, 1.24], Z = 0.98, p = 0.327, than when they were poorly identified (−1 SD), B = −0.86 [−1.66, −0.06], Z = −2.11, p = 0.035. The three-way interaction is plotted in an alternative way (a 3-D surface chart) in Supplementary Material.

4.2.3. Team-members' performance-avoidance goals

Consistent with Hypothesis 3b, the three-way interaction between leaders' performance-approach goals, time, and members' identification was significant, B = 0.06 [0.01, 0.10], Z = 2.50, p = 0.012. As shown in Fig. 5 (right panel), when time was high (+1 SD), the interaction between leaders' performance-approach goals and members' identification was significant, B = 0.86 [0.35, 1.36], Z = 3.34, p < 0.001, while this was not the case when it was low (−1 SD), B = −0.29 [−0.87, 0.29], Z = 0.99, p = 0.324. Specifically, leaders' performance-approach goals were more positively associated with subordinates' performance-avoidance goals when subordinates were highly identified (+1 SD), B = 1.06 [0.19, 1.93], Z = 2.38, p = 0.017, than when they were poorly identified (−1 SD), B = −0.81 [−1.77, 0.15], Z = −1.65, p = 0.098. The three-way interaction is plotted in an alternative way (a 3-D surface chart) in Supplementary Material.

4.3. Discussion

Extending the findings of Studies 1 and 2, and consistent with Hypotheses 3a and 3b, Study 3 showed that, over time, the higher the subordinates' identification with their group (in this case, video game team-members), the stronger the effect of supervisors' performance-approach goals (in this case, team leaders) on performance-approach goals (Hypothesis 3a) and performance-avoidance goals (Hypothesis 3b). Thus, the enabling condition of supervisor-to-subordinate performance goal transmission is the

Table 4
Coefficient estimates and confidence intervals for the models testing the effects of leaders' performance-approach goal, time, and identification on players' performance goals (Study 3).

		Players' performance-approach goals		Players' performance-avoidance goals	
		B	CI	B	CI
Level 1	Intercept, B_{00}	5.38***	[5.06, 5.70]	4.93***	[4.43, 5.42]
	Time spent in the group (T_{ij}), B_{10}	−0.03†	[−0.06, 0]	0.04	[−0.02, 0.10]
	Identification with the group (I_{ij}), B_{20}	−0.05	[−0.36, 0.26]	−0.09	[−0.53, 0.36]
	Initial performance (P_{ij}), B_{30}	−0.04†	[−0.09, 0]	−0.10**	[−0.17, −0.04]
	Time × identification with the group, B_{40}	−0.03†	[−0.06, 0]	0.00	[−0.05, 0.05]
Level 2	Leaders' performance-approach goals ($SPAp_j$), B_{01}	−0.25†	[−0.55, 0.05]	0.27	[−0.11, 0.64]
Cross-level	Time × leaders' performance-approach goals, B_{11}	0.00	[−0.04, 0.04]	−0.01	[−0.09, 0.06]
	Identification × leaders' perf.-app. goals, B_{12}	0.11	[−0.15, 0.37]	0.28†	[−0.02, 0.59]
	Time × identification × leaders' perf.-app. goals, B_{13}	0.05*	[0.004, 0.09]	0.06*	[0.01, 0.10]
Residual	Random slope (time spent in the group), var(u_{1j})	−		0.00	
	Level-1 error, var(e_{ij})	0.39		1.55	
	Level-2 error, var(u_{0j})	0.29		−	
	Intraclass correlation	0.43		−	

Note: The equation of the cross-level interaction model is Y_{ij} = B_{00} + B_{10} * T_{ij} + B_{20} * I_{ij} + B_{30} * P_{ij} + B_{40} * T_{ij} * I_{ij} + B_{01} * $SPAp_j$ + B_{11} * T_{ij} * $SPAp_j$ + B_{12} * I_{ji} * $SPAp_j$ + B_{13} * T_{ij} * I_{ij} * $SPAp_j$ + u_{1j} * T_{ij} + u_{0j} + e_{ij}.
*** p < 0.001.
** p < 0.01.
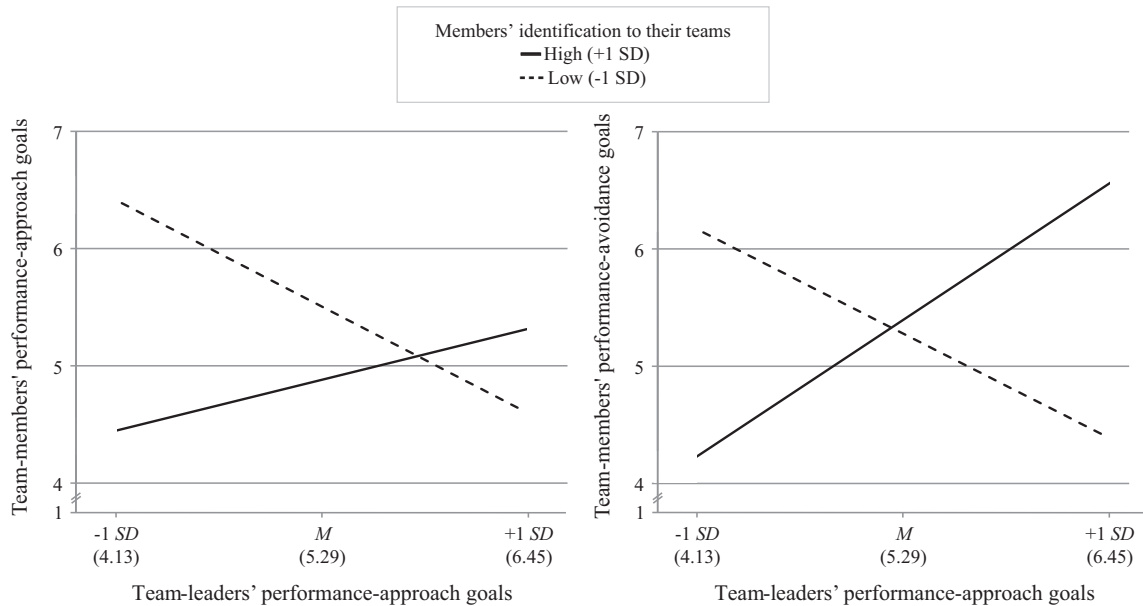* p < 0.05.
† p < 0.1.

Fig. 5. Team-members' performance-approach (left panel) and -avoidance (right panel) goals as a function of Team-leaders' performance-approach goals and team-members' identification with their team when time spent under the supervision of the coach is high (+1 SD). Study 3.

same as that of any socialization: Self-categorization is the condition for subordinates' performance-based goal to be influenced by those of their supervisors.

In sum, the moderating role of identification implies that performance goals socialization is truly an in-group process. For high identifiers, performance-approach-oriented supervisors promote performance-approach and -avoidance goals, which may have various downstream consequences on subordinates' attitudes and behaviors (e.g., on persistence, as in Study 2; see also, Elliot et al., 1999). For low-identifiers, performance-approach-oriented supervisors have a more limited influence, which may counteract the potential deleterious effects (or cancel out the potential beneficial effects) of performance goals socialization.

One might wonder whether the performance goals socialization effects—although moderated by group identification processes—actually correspond to a progressive endorsement of goals over time (i.e., a socialization effect) or to the fact that subordinates not pursuing the same goals as their supervisors are eventually excluded from (or decide to leave) the group (i.e., a (self-)selection effect; Bachman et al., 1987). Study 4 used a longitudinal design to rule out this alternative possibility.

Another important issue remains unaddressed. In Studies 1–3, supervisors' performance-approach goals were found to be associated with the emergence of both subordinates' performance-approach *and* -avoidance goals over time. Yet, these two goals are distinct constructs and produce competing effects (Murayama, Elliot, & Yamagata, 2011). It is therefore critical to specify when supervisors' performance-approach goals predict one or the other. Since high perceived self-competence is an antecedent of performance-approach goals and low self-competence is an antecedent of performance-avoidance goals (for a review, see Murayama & Elliot, 2012b), we expected perceived self-competence to be the directional moderator of performance goals socialization. Supervisors' performance-approach goals should prompt performance-approach goals for subordinates perceiving themselves as being sufficiently competent (Hypothesis 4a) and performance-avoidance goals for subordinates perceiving themselves as being insufficiently competent (Hypothesis 4b). This idea was tested in a fourth type of achievement setting, namely secondary education.

5. Study 4. Schoolteachers and pupils

5.1. Method

5.1.1. Participants

$N_{T1} = 625$ French middle school students and their 25 teachers concurrently took part in the first wave of the study. $N_{T2} = 496$ of the first-wave pupils whose teacher(s) participated fully completed the second wave questionnaire. One teacher was removed due to incomplete data. The final pupil sample consisted of 496 pupils (259 boys and 237 girls; 124 sixth-graders, 124 seventh-graders, 139 eight-graders, and 109 ninth-graders; $M_{age} = 13.16$, $SD = 1.19$). The final teacher sample consisted of 24 teachers (7 men and 17 women; $M_{age} = 41.0$, $SD = 11.04$; years of seniority, $M = 15.06$ years, $SD = 11.42$; 20.7 pupils per teacher, $min = 5$, $max = 44$).

5.1.2. Procedure

5.1.2.1. Wave 1. At the beginning of the school year (i.e., late September), two experimenters submitted a first questionnaire to the pupils of a French middle school. Parents were informed by mail about the general purpose of the study two weeks before. All except four pupils were allowed to participate in the study. The Wave 1 questionnaire measured pupils' achievement goals and perceived self-competence in six disciplines, namely Mathematics, First Foreign Language, French, Physical Education, History and Geography, and Earth and Life Science. Additionally, pupils were asked whether or not "[they] knew [their] teacher before this school year" for the six same disciplines (1435 negative answers, 585 positive ones, and 40 missing). At the same time, the teachers in the six aforementioned disciplines (6 in Mathematics, 6 in First Foreign Language, 5 in French, 3 in Physical Education, 2 in History and Geography, and 2 in Earth and Life Science) reported, in a paper-and-pencil or on-line questionnaire, their performance-approach goals for teaching.[12] In sum, there were $N = 2060$ discipline-based units (level 1), both nested in $K_{2a} = 496$ pupils (level

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[12] For the sake of full disclosure, note that teachers also answered six items extracted from the Portrait Values Questionnaire (Schwartz et al., 2001); the analysis of these materials is not reported, as they do not inform the present set of hypotheses.

Table 5
Coefficient estimates and confidence intervals for the models testing the effects of teacher's performance-approach goal and pupils' perceived self-competence on change in pupils' performance goals (Study 4).

		Change in pupils' performance-approach goals		Change in pupils' performance-avoidance goals	
		B	CI	B	CI
Level 1	Intercept, B_{000}	-0.29^{***}	[−0.41, −0.17]	-0.13^{*}	[−0.24, −0.02]
	Perceptions of self-competence (SC_{ijk}), B_{100}	$-0.03^{\dagger}$	[−0.05, 0]	-0.03^{*}	[−0.06, 0]
	Teacher familiarity (F_{ijk}), B_{200}	–	–	−0.04	[−0.18, 0.10]
	Self-competence × familiarity, B_{300}	–	–	−0.03	[−0.09, 0.02]
Level 2a	Change in pupils' performance-based goals (PG_j), B_{010}	0.18^{***}	[0.14, 0.23]	0.19^{***}	[0.15, 0.24]
Level 2b	Teachers' performance-approach goals ($SPAp_k$), B_{001}	−0.01	[−0.05, 0.03]	0.01	[−0.03, 0.04]
Cross-level	Self-competence × teachers' goals, B_{101}	0.02^{**}	[0.01, 0.04]	0.00	[−0.01, 0.02]
	Familiarity × teachers' goals, B_{102}	–	–	−0.05	[−0.13, 0.03]
	Self-competence × familiarity × teachers' goals, B_{103}	–	–	0.04^{*}	[0.01, 0.07]
Residual	Random slope (perceptions of self-competence), var(u_{1jk})	0.01		0.13	
	Random slope (teachers' perf.-approach goals), var(u_{2k})	0.05		–	
	Level-1 error, var(e_{ijk})	1.13		1.16	
	Level-2a error, var(u_{0j})	1.50		1.01	
	Level-2b error, var(u_{0k})	0.00		0.00	
	Level-2a intraclass correlation	–		–	

Note: Change in pupils' performance-based goals pertained to performance-avoidance goals when using change in pupils' performance-approach goals, and vice versa. The equation of the cross-level interaction model is $Y_{ijk} = B_{000} + B_{100} * SC_{ijk} + B_{200} * F_{ijk} + B_{300} * SC_{ijk} * F_{ijk} + B_{010} * PG_j + B_{001} * SPAp_k + B_{101} * SC_{ijk} * SPAp_k + B_{102} * F_{ijk} * SPAp_k + B_{103} * SC_{ijk} * F_{ijk} * SPAp_k + u_{1jk} * SC_{ijk} + u_{2k} * SPAp_k + u_{0k} + u_{0j} + e_{ijk}$.

*** $p < 0.001$.
** $p < 0.01$.
* $p < 0.05$.
† $p < 0.1$.

2a; $n_{2a} = 4.2$ observations per children) and in $K_{2a} = 24$ teachers (level 2b; $n_{2b} = 85.83$ observations per teacher).

5.1.2.2. Wave 2.
Four months later (i.e., late January), two experimenters invited the pupils to fill in a second questionnaire, once again measuring their goals for the same six disciplines.

5.1.3. Measures

5.1.3.1. Teachers' performance-approach goals (level 2b).
In Wave 1, as in Studies 1–3, teachers answered items adapted from the AGQ. This time, items were adapted to fit the school domain (e.g., "When I am teaching, it is important for me to teach better as compared to other teachers"; $\alpha = 0.87$, $M = 2.58$, $SD = 1.61$).

5.1.3.2. Pupils' perceived self-competence (level 1).
In Wave 1, on a scale ranging from 0 ("*not competent at all*") to 100 ("*fully competent*"), pupils reported their perceived self-competence in each of the aforementioned six disciplines ($M = 62.38$, $SD = 25.05$). For the ease of reading, the variable was divided by 10 ($M' = 6.24$, $SD' = 2.51$).

5.1.3.3. Change in pupils' performance goals from Wave 1 to Wave 2 (level 1).
For each wave, pupils answered the performance goal items adapted from the AGQ. One of the performance-avoidance items was removed due to reliability issue (i.e., "My fear of performing poorly in this discipline is what motivates me"; as in past research, e.g., Darnon, Harackiewicz, Butera, Mugny, & Quiamzade, 2007). For each discipline, three items measured performance-approach goals (e.g., "My goal in this discipline is to have better grade than most of others pupils") at Wave 1 (average of the six Cronbach's alpha for all disciplines, $M_\alpha = 0.86$, $M = 4.03$, $SD = 1.89$) and Wave 2 ($M_\alpha = 0.90$, $M = 3.75$ $SD = 1.97$). Change in performance-approach goals was computed by subtracting the latter from the former ($M = -0.29$, $SD = 1.70$, $sk = 0.01$). Two items measured performance-avoidance goals (e.g., "I just want to avoid

doing poorly in this discipline") at Wave 1 ($M_\alpha = 0.58$, $M = 5.84$, $SD = 1.46$) and Wave 2 ($M_\alpha = 0.71$, $M = 5.64$, $SD = 1.62$). Change in pupils' performance-avoidance goals was also computed by subtracting the latter from the former ($M = -0.20$, $SD = 1.60$, $sk = -0.22$).[13]

5.2. Results

Predictors, coefficient estimates, and confidence interval are presented in Table 5.

5.2.1. Multilevel modeling procedure and preliminary analysis
In the present data, discipline-based observations were cross-classified by pupils and teachers. Thus, we built two *cross-classified* multilevel models (one for change in pupils' performance-approach goals and another for change in pupils' performance-avoidance goals). Each model included the following four grand-mean centered predictors: teachers' performance-approach goals, pupils' perceived self-competence, the interaction, as well as change in pupils' performance-avoidance goals when the outcome was performance-approach goals, and *vice versa* (to disentangle the effects of one goal from the effect of the other; see Supplementary Material for the details of the procedure).

As in Studies 1–3, we ran a complete analysis of covariance to determine the need for controlling additional covariates. We observed an effect of the fact that the teacher was known before

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[13] The conclusions of the main analysis are the same when using pupils' performance goals at Wave 2 as the outcome variable (while controlling for performance-approach and -avoidance goals at Wave 1). In doing so, the interaction effect between teachers' performance-approach goals and pupils' perceived self-competence on pupils' performance goals at Wave 2 is $B = 0.02$ [0.01, 0.04], $Z = 3.19$, $p < 0.001$, whereas the second-order interaction between teachers' performance-approach goals, pupils' perceived self-competence, and teacher familiarity on pupils' performance-avoidance goal at Wave 2 is $B = 0.03$ [0.01, 0.06], $Z = 2.36$, $p = 0.018$. However, we have decided to keep using the difference score as the outcome variable because this enabled us to estimate the average change in goal endorsement.

the school year on change in pupils' performance-avoidance goals (the covariates was coded "−0.5" for "teacher unknown" and "+0.5" for "teacher known" and is referred to as *teacher familiarity*). Thus, the term was kept for this outcome (see Supplementary Material for the details of the analysis).

5.2.2. Change in pupils' performance-approach goals

The intercept was found to be significantly different from zero, $B = -0.29$ [−0.41, −0.17], $Z = -4.67$, $p < 0.001$, suggesting a general decrease of pupils' performance-approach goals from Wave 1 to Wave 2. More importantly, in line with Hypothesis 4a, the analyses revealed an interaction between teachers' performance-approach goals and pupils' perceived self-competence, $B = 0.02$ [0.01, 0.04], $Z = 2.94$, $p = 0.003$. As shown in Fig. 6 (left panel), when perceived self-competence was high (+1 SD), teachers' performance-approach goals were more positively associated with change in performance-approach goals, $B = 0.05$ [0, 0.10], $Z = 1.87$, $p = 0.062$, than when perceived self-competence was low (−1 SD), $B = -0.06$ [−0.12, −0.004], $Z = -2.09$, $p = 0.037$.

5.2.3. Change in pupils' performance-avoidance goals

The intercept was again found to be significantly different from zero, $B = -0.13$ [−0.24, −0.02], $Z = -2.27$, $p = 0.023$, suggesting a general decrease in performance-avoidance goals for Wave 1 to Wave 2. More importantly, the second-order interaction between teachers' performance-approach goals, pupils' perceived self-competence, and teacher familiarity was significant, $B = 0.04$ [0.01, 0.07], $Z = -2.52$, $p = 0.012$. Specifically, the interaction between teachers' performance-approach goals and pupils' perceived self-competence was not significant when the teacher was known before the beginning of the school year, $B = 0.02$ [0, −0.05], $Z = 1.62$, $p = 0.105$, whereas it was significant when s/he was unknown, $B = -0.02$ [−0.04, −0.001], $Z = -2.11$, $p = 0.035$. As shown in Fig. 6 (right panel), when perceived self-competence was low (−1 SD), teacher's performance-approach goals were more positively associated with change in performance-avoidance goals, $B = 0.08$ [0.01, 0.14], $Z = 2.29$, $p = 0.022$, than when perceived competence was high (+1 SD), $B = -0.02$ [−0.07, 0.04], $Z < |1|$, $p = 0.585$.

5.3. Discussion

Extending the findings of Studies 1–3, and consistent with Hypotheses 4a and 4b, Study 4 showed that perceived self-competence moderated performance goals socialization.

On the one hand, the higher subordinates' perceived self-competence (in this case, middle school students), the stronger the effect of supervisors' performance-approach goals (in this case, teachers) on the change in subordinates' performance-approach goals (Hypothesis 4a). On the other hand, the lower subordinates' perceived self-competence, the stronger the effect of supervisors' performance-approach goals on the change in subordinates' performance-avoidance goals (Hypothesis 4b). However, Hypothesis 4b was confirmed only when pupils did not know their teacher before the beginning of the school year. This unexpected result is coherent with a socialization process, to the extent that it means that pupils who already knew their teacher could have *already* been socialized. As this difference was not observed for performance-approach goals, it also suggests a somehow faster performance-avoidance (*vs.* performance-approach) goals socialization (as in Study 1). However, it should be emphasized that we decided to include teacher familiarity as an additional moderator following the preliminary analysis. Thus, the results pertaining to performance-avoidance goals should be considered as exploratory and would require further confirmation using a deductive approach.

In sum, the moderating role of perceived self-competence implies that the outcome of performance goals socialization is not invariable. For subordinates high in self-competence, performance-approach-oriented supervisors prompt the endorsement of performance-approach goals, which are typically associated with a mixed pattern of adaptive and maladaptive outcomes (e.g., high performance but low openness to collaboration; see Senko, Hulleman, & Harackiewicz, 2011). However, for subordinates low in self-competence, performance-approach-oriented supervisors prompt the endorsement of performance-avoidance goals, which are typically associated with a pattern of maladaptive outcomes (e.g., low performance and interaction anxiety; Valentiner, Mounts, Durik, & Gier-Lonsway, 2011).
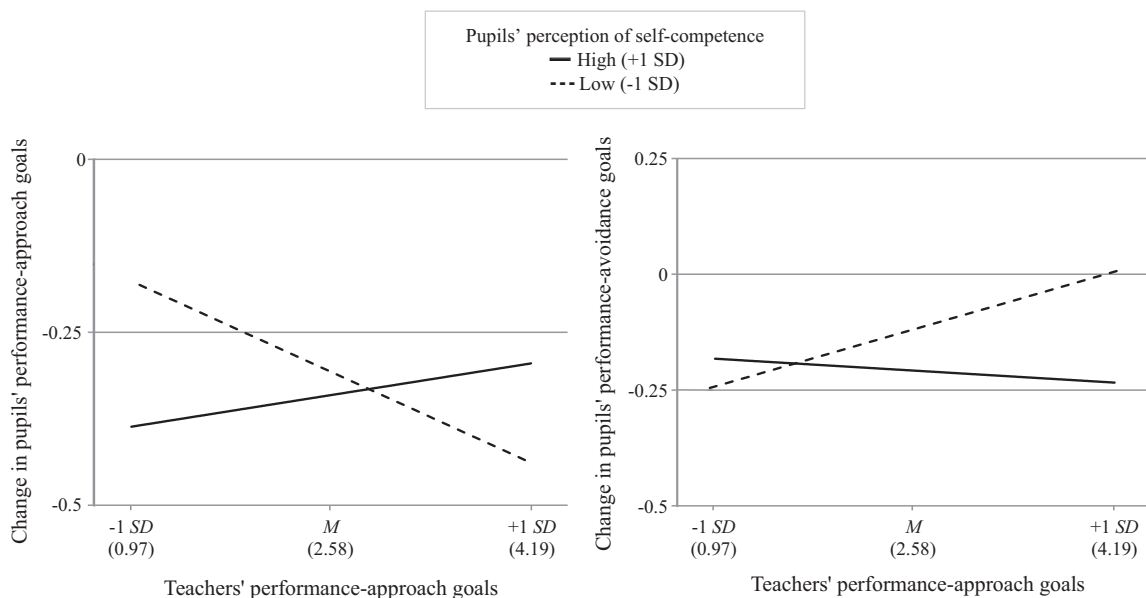
Fig. 6. Pupils' change in performance-approach (left panel) and -avoidance (right panel) goals as a function of teachers' performance-approach goals and pupils' perception of self-competence. For the right panel, the interaction concerns the case where teacher was unknown before school year began. Study 4.

One might wonder why a general decline in both performance goals was observed. Shim, Ryan, and Anderson (2008) has reported similar within-school-year decline in all types of achievement goals for 6th and 7th graders. The authors argued that novelty or uncertainty at the beginning of the school year may generally heighten the pursuit of achievement goals. The overall decline in achievement goals might also be due to fall-to-spring change in pupils' concerns about evaluation (Meece & Miller, 2001) or to a progressive increase of pupils' normative clear-sightedness (Bigot, Pichot, & Testé, 2004; especially for performance goals which are socially undesirable; Dompnier, Darnon, Delmas, & Butera, 2008; Pekrun, Elliot, & Maier, 2009).

6. General discussion

Performance-based goals have high social costs for groups, to the extent that they have been associated with hostile responses to academic disagreements within learning dyads (Sommet et al., 2014), non-cooperative organizational behaviors within work teams (Poortvliet & Giebels, 2012), or unsportsmanlike conducts within sport teams (Boardley & Kavussanu, 2010). It is thus crucial to understand how—in spite of these detrimental costs—social reproduction of these goals operates. In the present research, we focused on the function of group supervisors as agents of performance goals socialization.

Across various achievement domains, four studies provided convergent evidence for performance goals socialization, as well as empirical illustrations of its consequences, enabling condition, and directional moderator. With respect to the *phenomenon* itself, in a first cross-sectional study involving sport teams, coaches' performance-approach goals were found to be positively associated with the emergence of their players' performance-approach *and* -avoidance goals. With respect to its *consequences*, in a second cross-sectional study involving academic organizations, thesis supervisors' performance-approach goals were found to be associated with an increase over time (directly and indirectly through the emergence of performance-approach goals) in their Ph.D. students' intentions to drop out *and* with a decrease over time (directly and indirectly through the emergence of performance-avoidance goals) in their Ph.D. students' satisfaction. With respect to its *enabling condition*, in a third cross-sectional study involving video game teams, leaders' performance-approach goals were found to be more positively associated with the emergence of performance-approach and -avoidance goals, as team-members' in-group identification increased. Since self-categorization is needed for goal influence to occur, this result underlines that the phenomenon under study is indeed a form of socialization. With respect to its *directional moderator*, in a last longitudinal study involving secondary school classrooms, teachers' performance-approach goals were found to be more positively associated with change in performance-approach goals as pupils' perceived competence increased, and with change in performance-avoidance goals as it decreased.

6.1. Theoretical contributions

The first contribution of the present set of studies pertains to the issue of the predictors of performance-based goals. Independently of each other, some scholars addressed this question at a structural level (e.g., group goal structure; Wolters, 2004), while others addressed it at the intrapersonal level (e.g., perceived self-competence; Elliot & Church, 1997). In adopting an integrative cross-level approach, the findings of Studies 1, 2 and 4 allow to articulate these two levels of analysis. At level 2, group-supervisors promote the endorsement of performance-based goals socialization, whereas at level 1, subordinates' perceived self-

competence is a predictor of the approach vs. avoidance component associated with these performance-based goals. Considering both supervisors' and subordinates' goals, our results extend the work on performance goals adjustment over time (e.g., Kumar & Jagacinski, 2011; Meece & Miller, 2001; Senko & Harackiewicz, 2005), by showing the importance of taking interpersonal and inter-positional perspectives (studying the (goals) dynamics between individuals different in status; Doise, 1986) in understanding that adjustment (Poortvliet & Darnon, 2010).

The second contribution of the present set of studies pertains to the place of achievement goals in the literature on socialization. On the one hand, achievement goals theorists have shown that the expression of performance-approach goals depends on the norms of a given social system (Dompnier, Darnon, & Butera, 2013). On the other hand, group socialization theorists have accumulated evidence that social identification was the *sine qua non* condition of the social transmission of normative values, attitudes, and goals over time (e.g., Guimond, 2000). Building a bridge between these two literatures, Study 3's findings reveal that the enabling condition involved in performance goals socialization is analogous to that of any socialization process: High-identifiers under the supervision of a performance-approach-oriented leaders may come to recognize performance-based goals as the social-normative achievement goals and come to integrate it. Another implication of such phenomenon is that clear-sighted subordinates under the supervision of a performance-approach-oriented leader may perceive performance-based goals as socially desirable and endorse them for self-presentation purpose (to gain positive evaluation; see Darnon, Dompnier, & Poortvliet, 2012). Since supervisors often try to secure compliance and conformity via authority (Michel, Wallace, & Rawlings, 2013), but subordinates often genuinely embrace their group-leaders' goals (Tyler, 2006), future research is needed to determine the extent to which performance goals socialization is a manifest or a latent phenomenon (Bender, 1967). These questions notwithstanding, our findings highlight the need to take a structural perspective in understanding the effects of performance goals, that is, studying the (goals) dynamics as a function of social norms (Doise, 1986; Poortvliet & Darnon, 2010).

6.2. Applied contributions

This research also has an important practical implication: Study 2 shows that performance-approach-oriented supervisors elicit—via performance goals socialization—the emergence of a maladaptive pattern of motivation and well-being (drop out and dissatisfaction). More generally speaking, subordinates' performance goals are not only associated with a series of detrimental *intrapersonal* behaviors (e.g., long-term learning, Murayama & Elliot, 2011; for a discussion of their more adaptive outcomes, see Senko et al., 2011), but also with detrimental *intragroup* behaviors (e.g., hostile, antisocial, uncooperative conducts; see Sommet, Darnon, & Butera, 2015). Thus, it would seem reasonable to assume supervisors' performance-approach goals to predict—via performance goals socialization—dysfunctional regulation of in-group behaviors.

Because of performance goals' elevated social cost for groups, small group researchers argued that these goals should be discouraged within learning groups and formulated practical recommendations. Relying on an *individual-level* approach, Dierdorff and Ellington (2012) proposed interventions aiming at reducing trainees' focus on normative performance (and by extension performance-based goals). Given our results, one might doubt that performance-oriented trainees could easily be re-socialized, given the permanent presence of their performance-approach-oriented team-leader. However, relying on a *structural-level* approach,

Gully and Phillips (2005) recommend leaders to use feedback and focus the reward system on processes rather than outcomes (thus reducing followers' performance-based goals). Again, given our results, one might doubt that performance-approach-oriented leaders would rely on such management practices, as they could conflict with their own goals. For our part, relying on a *cross-level* approach, we suggest that interventions should be framed in such a way as to reduce supervisors' *personal* performance-approach goals, therefore resulting in a more profound change in their managing practices. In this regard, Skaalvik and Skaalvik (2013) reported a correlation between teachers' perception of their school performance goals structure (i.e., school emphasizing performance goals) and their personal performance-approach goals. Policies based on structural changes might reduce the performance goals of supervisors and, through socialization, that of their subordinates.

6.3. Limitations

Some limitations should be noted. First, it should be stressed that the samples used in the present study consisted of convenience samples, and replications using more representative samples might provide a hint on the prevalence of performance goals socialization. This limitation notwithstanding, the variety of the contexts of the data collection speaks in favor of a potential generalization of our results: Performance goals socialization was observed in sport teams, academic organizations, video game teams, and middle school classrooms, and is likely to be observed across other social groups.

Second, higher-level sample sizes varied from one study to another ($K_{S1} = 14$, $K_{S2} = 41$, $K_{S3} = 24$, $K_{S4} = 24$). In multilevel modeling, the number of clusters is more important than the number of participants (or than the average number of participants per cluster). For instance, with 30 clusters, standard errors for the second-level variance components are estimated about 15% too small (see Maas & Hox, 2005). Although the overall pattern of results speaks in favor of the robustness of performance goals socialization, replications with larger number of level-2 units would be an important future endeavor.

Third, the empirical evidence related to the effect of supervisors' performance-approach goals on the emergence of subordinates' performance-*avoidance* goals were substantially more complex. In Study 1, unexpected ceiling and floor effects of time were found, whereas in Study 4's, the effect was only found when subordinates (pupils) did not know their supervisors before (teachers). These findings might reflect the fact that the socialization of performance-avoidance goals operates rather rapidly, to the extent that, in Study 4, subordinates who knew their performance-approach-oriented supervisors before the study might have already been socialized. Hence, we caution scholars willing to investigate the effect of supervisors' goals on their subordinates' performance-avoidance goals that it might be more difficult to detect.

Fourth, Studies 1 and 2's results did not provide any evidence of *mastery goals socialization*: Supervisor's mastery goals did not significantly predict subordinates' mastery goals over time. On the one hand, such a null effect might be explained by *a perceptual bias*. In explaining why cooperation is often (wrongly) perceived as being less prevalent than competition, Kohn (1992) argued that "cooperation is not always plain in the eyes, whereas competition [...] can be readily observed" (p. 22; for an empirical illustration, see Maki, Thorngate, & McClintock, 1979). As mastery goals rely on a self-referenced standard of competence evaluation, whereas performance-approach goals rely on an other-referenced standard (Elliot, 1999), supervisors' performance-approach goals might be more easily detectable (and endorsed) by subordinates (Eren, 2009). On the other hand, the null effect might be explained by a

social desirability bias. Since mastery goals are more socially desirable than performance-approach goals, the level of self-reported mastery goals in the literature is generally inflated relative to that of performance-approach goals (see Darnon et al., 2009). As a matter of fact, in Studies 1 and 2, the distribution of mastery goals was highly skewed to the left, which may have prevented to find evidence of mastery goals socialization. It is therefore not implausible for mastery goals socialization to be observed in social environments in which these goals are not perceived as socially desirable (e.g., organizations in which competitiveness is valued and culture is focused on making profit; see Browaeys & Price, 2008).

Fifth, the present set of studies did not study the mechanism(s) by which supervisors' performance-approach goals are communicated to their subordinates. Drawing on the research on classroom goal structure, it is legitimate to think that supervisors' management and instructional practices could mediate the relationship between supervisors' performance-approach goals and subordinates' performance-based goals (Ames, 1992). Performance-approach-oriented supervisors were found to use more repetitive task, to provide more normative feedbacks (Meece, Anderman, & Anderman, 2006), or to display more transactional leaderships (based on control and monitoring; Hamstra, Van Yperen, Wisse, & Sassenberg, 2013). These performance-oriented practices may allow subordinates to detect the supervisor's performance-approach goals. Future research might also examine other potential mediators, such as group performance-approach goals (i.e., the desire of the group as an entity to outperform other groups; Porter, 2008) or perceived social utility of performance-based goals (e.g., the perception of performance-approach goals as being an effective tool to succeed; Dompnier et al., 2013).

6.4. Conclusion

Scholars have documented various effects pertaining to the hierarchical transmission of values or motives: from caretakers to children (Elliot & Thrash, 2004), from instructors to trainees (Radel, Sarrazin, Legrain, & Wild, 2010), or from principals to schoolchildren (Berson & Oreg, 2016). The present work expands this research by offering a systematic analysis of the phenomenon of performance goals socialization, and providing evidence on its consequences, enabling condition, and directional moderator. Specifically, we have unraveled the role of supervisors, as well as the influence of group-identification and perceived competence, in explaining the evolution of subordinates' performance-based goals. In conclusion, the present set of studies sheds a new light on the process of achievement goals construction and shows the critical importance of considering social hierarchy when studying performance goals formation.

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Appendix A. Supplementary material

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.cedpsych.2017.03.008.

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