



Sex differences in goal orientation in adolescents aged 10–19: The older boys adopt work-avoidant goals twice as often as girls

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ABSTRACT

This study investigated sex differences in goal orientation during adolescence. 910 adolescents aged 10–19 years read vignettes of students reflecting four goal orientations and indicated which student they resembled most. Boys and girls from two age-groups (10–14 versus 14–19 years old) were compared. Multinomial logistic regression was performed with goal orientation as dependent variable, including level of parental education as a covariate. Results showed that girls were more likely than boys to endorse mastery goals (48% vs 39%) or performance-avoidant goals (20% vs 14%). Boys more often endorsed work-avoidant or performance-approach goals. At age 14–19 years, work-avoidance was more than twice as common for boys as girls (27% vs 12%). With age, mastery goals decreased (from 52% to 36%), whereas work-avoidant goals increased (from 8% to 18%). These age and sex differences in goal orientations may be a possible explanation for boys' lower academic achievement compared to girls' and show a need for early intervention.

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1. Introduction

Across countries, boys and girls differ in academic achievement in the advantage of girls (Van Langen, Bosker, & Dekkers, 2006). This gender gap in achievement may possibly be explained by differences in motivation for learning. Goal theory is one of the most prominent theories in motivation research, which conceptualizes motivation as the striving to reach goals (Dweck, 1986). Students set different goals to guide their approach to learning. These *goal orientations* have the potential to explain sex differences in school achievement, as they relate to academic achievement (Steinmayr, Bipp, & Spinath, 2011; Steinmayr & Spinath, 2008, 2009) and various academic behaviors (Bong, 2009; Daniels et al., 2008; Elliot, McGregor, & Gable, 1999; Sungur, 2007; Vansteenkiste, Sierens, Soenens, Luyckx, & Lens, 2009; Wang & Pomerantz, 2009; Wolters, 2004). Commonly, four different goal orientations are distinguished: mastery, work-avoidant and two performance goals (see Table 1) (Dweck, 1986; Elliot et al., 1999). This study examined sex differences in goal orientations during adolescence.

Boys aged 13–17 years were found to endorse work-avoidant goals more often than same-aged girls (Freudenthaler, Spinath, &

Neubauer, 2008; Steinmayr & Spinath, 2008; Steinmayr et al., 2011). Mastery goals were found to decrease with age until at least age 15 (Wigfield & Cambria, 2010); sex differences were less consistently found in mastery and performance goals (Freudenthaler et al., 2008; Meece, Glienke, & Burg, 2006). Inconsistencies have been attributed to sample differences (Meece, Glienke, et al., 2006), but may also result from a lack of uniformity in assessment instruments. Usually, goal orientations are assessed with sum-scores based on multiple items on Likert-scale questionnaires (Wigfield & Cambria, 2010). Yet, some items in these questionnaires were found to be biased for sex (Van der Sluis, Vinkhuyzen, Boomsma, & Posthuma, 2010), i.e., the individual items did not relate to the same underlying construct for boys and girls.

To avoid sex-related item biases, the current study proposes a new methodology to assess goal orientations. We designed short student characterizations, so-called *vignettes*, each reflecting student behavior of one of the four goal orientations. Respondents indicated which of the students they resembled most. During adolescence, students become increasingly occupied with their role and social position (Brown, 2004). Therefore, comparing themselves with peers may be easier for adolescents than rating their behavior on multiple items. As each response option is justifiable, social desirable responses were minimized. The single response option furthermore eliminates response style biases, e.g. acquiescence bias or extremity bias. A strength for educational practice is that vignettes yield information about the prevalence of goals, which is more revealing for teachers than dimensional scores.

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Table 1
Characteristics of goal orientations.

Goal orientation	Characteristics
Mastery	Eager to learn – Curious – Focus on deep understanding
Work-avoidant	Do not like learning – Invest little effort in school
Performance-approach	Aim to demonstrate superior ability – Focus on rewards
Performance-avoidance	Aim to avoid failures – Focus on minimizing embarrassments

In conclusion, the present study was designed to increase knowledge about sex differences in goal orientations. Adolescents in two age-groups indicated which goal orientation vignette most resembled them. Work-avoidant goals were expected to be more prevalent among boys, mastery goals more prevalent among girls. With age, a decrease in mastery goals was expected. We had no a priori hypotheses about age and sex differences in performance goals, or age differences in work-avoidant goals.

2. Method

2.1. Participants

The sample included 910 adolescents from grades 5–12 (45.2% boys; 98% Dutch nationality), aged 10.2–19.2 years. All secondary school students (grade 7–12) followed higher general secondary education or pre-university education tracks. Of the 926 students originally participating in this research, $N = 16$ were excluded because of missing values. Adolescents were divided in two age-groups: younger than 14 years ($N = 412$, M age = 12.6, $SD = 0.92$) and 14 years and older ($N = 498$, M age = 16.0, $SD = 1.31$). Level of Parental Education (LPE) was low/medium in 38% and high in 62% of the participants.

2.2. Procedure

This study is part of a larger cross-sectional study in adolescents, which was approved by the ethical committee of VU University Amsterdam. Participants were recruited from six primary and four secondary schools in the Netherlands. Students and their parents received information letters about the study. Both were asked to give informed consent. Response rate was 30%. The procedure was equal for primary and secondary school students. Parents returned a questionnaire on background characteristics. Students completed questionnaires in the classroom, during a regular lesson, under supervision of two trained researchers who gave instructions and checked whether the questionnaire was complete when it was handed in. It took approximately 40 min to complete all questionnaires, including the goal orientation vignettes.

2.3. Measures

2.3.1. Demographics

Participants completed a questionnaire on background characteristics and reported age, sex and educational track. Parents rated their level of education on a commonly used 8-point rating scale, ranging from primary school to university degree (De Bie, 1987). LPE was defined as the highest educational level attained by both parents. LPE was split into low/medium and high, with low/medium reflecting parents who had at most a secondary vocational educational level.

2.3.2. Goal orientations

We designed short characterizations, or *vignettes*, of students that differed in goal orientation. We distinguished mastery students, two work-avoidant students (one best described by 'lazy'; the other by 'indifferent about school'), performance-approach and performance-

avoidant students. Mastery and performance vignettes were based on a questionnaire by Simons, Dewitte, and Lens (2004). The work-avoidant vignettes were designed for this study; key features were similar to characterizations of work-avoidance by Harackiewicz et al. (2008), namely 'doing the least amount of work possible' and 'lack of motivation to work hard'. A full description of the vignettes can be found in the Appendix A. Participants selected the vignette that reflected the goal they mainly endorse for all academic activities. The order in which the vignettes were presented to the participants was fixed: (1) Performance-avoidant, (2) Work-avoidant [indifferent], (3) Performance-approach, (4) Mastery and (5) Work-avoidant [lazy]. This order was chosen to decrease socially desirable responses, which could have occurred if the mastery vignette were presented first and the work-avoidant vignettes last.

2.4. Data analysis

The frequency of the work-avoidant [indifferent] type was very low (1.5%), therefore data of both work-avoidant vignettes were combined into one work-avoidant category. Thus, all analyses were performed on four goal orientations, namely mastery, work-avoidant, performance-approach and performance-avoidant goals. Goal orientations were equally distributed over both educational tracks ($\chi^2(3, N = 739) = 5.54, p = .136$), therefore the factor educational track was left out of the analyses. Multinomial logistic regression was performed with goal orientation as a dependent variable. To analyze all possible contrasts between the four goal orientations, the regression analysis was repeated with three different goals as reference category. Independent variables were age-group (young = 0; old = 1) and sex (boys = 0; girls = 1). LPE was included as a covariate because this factor has been shown to moderate sex effects (Meece, Glienke, & Burg, 2006b). First, a full factorial model was run including the interaction term age-group*sex. In absence of significant interactions, the regression analysis was repeated without the interaction term, because we did not have specific hypotheses about interactions. Level of significance was $\alpha = 0.05$.

3. Results

3.1. Descriptives

Analysis of frequency showed the percentages of students in each of the four goal orientations (see Fig. 1). In both age-groups, mastery

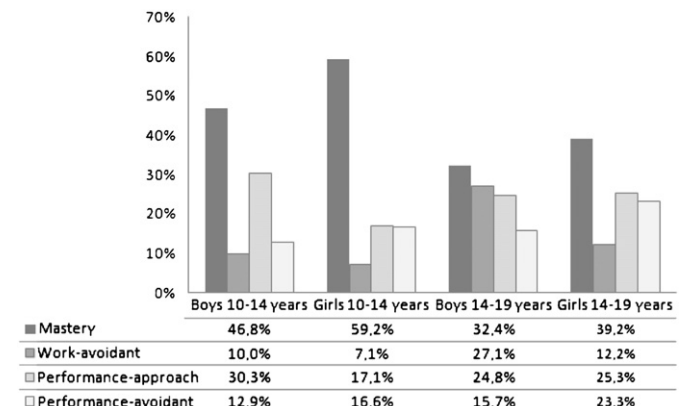


Fig. 1. Descriptives of age and sex differences in goal orientations.

oriented students were most prevalent. In the younger age-group, 47% of all boys and 59% of all girls reported mastery goals. Thus, about half of the students aged 10–14 years considered themselves mastery oriented. In the older age-group (14–19 years), these percentages were lower: 32% for boys compared to 39% for girls.

Work-avoidant goals were more frequent among boys, in particular in the older age-group. More than a quarter (27%) of all boys aged 14–19 years considered themselves work-avoidant. This was more than twice as many as girls (12%) from the same age-group.

Within performance goals, boys and girls were unevenly distributed over approach and avoidance goals. Approach goals were more often endorsed by boys (28%) than girls (22%). In contrast, girls endorsed avoidance goals more often than boys (20% vs. 14%).

The significance of these age and sex differences was examined using multinomial logistic regression analyses (see Table 2).

Table 2
Results multinomial logistic regression.

	B (SE)	95% CI for odds ratio		
		Lower	Odds ratio	Upper
<i>Mastery" vs. work-avoidant</i>				
Intercept	−1.38 (.458)**			
Age group	−1.24 (.226)***	.186	.289	.451
Sex	.922 (.213)***	1.66	2.51	3.82
LPE	.049 (.076)	.905	1.05	1.22
<i>Mastery" vs. performance-avoidant</i>				
Intercept	.009 (3.38)			
Age group	−.677 (.192)***	.349	.508	.740
Sex	−.099 (.195)	.618	.906	1.33
LPE	−.104 (.066)	.792	.901	1.03
<i>Mastery" vs. performance-approach</i>				
Intercept	−.546 (.360)			
Age group	−.487 (.170)**	.440	.615	.858
Sex	.466 (.170)**	1.14	1.59	2.22
LPE	−.003 (.060)	.886	.997	1.12
Note: " = reference category. $R^2 = .069$ (Cox & Snell), .075 (Nagelkerke). Model $\chi^2(9) = 65.5$, $p < .000$.				
* $p < .05$, ** $p < .01$, *** $p < .001$.				
	B (SE)	95% CI for odds ratio		
		Lower	Odds ratio	Upper
<i>Performance-avoidant" vs. performance-approach</i>				
Intercept	−.555 (.428)			
Age group	.190 (.213)	.796	1.21	1.84
Sex	.564 (.213)**	1.16	1.76	2.67
LPE	.101 (.073)	.959	1.11	1.28
<i>Performance-avoidant" vs. work-avoidant</i>				
Intercept	−1.39 (.510)**			
Age group	−.563 (.260)*	.342	.569	.949
Sex	1.02 (.247)***	1.71	2.78	4.50
LPE	.153 (.086)	.985	1.17	1.38
Note: " = reference category. $R^2 = .069$ (Cox & Snell), .075 (Nagelkerke). Model $\chi^2(9) = 65.5$, $p < .000$.				
* $p < .05$, ** $p < .01$, *** $p < .001$.				
	B (SE)	95% CI for odds ratio		
		Lower	Odds ratio	Upper
<i>Performance-approach" vs. work-avoidant</i>				
Intercept	−1.01 (.499)*			
Age group	−.142 (.370)	.420	.868	1.79
Sex	.824 (.281)**	1.31	2.28	3.96
LPE	.050 (.081)	.420	.868	1.79
Age * Sex	−1.06 (.490)*	.132	.345	.902
Note: " = reference category. $R^2 = .075$ (Cox & Snell), .082 (Nagelkerke). Model $\chi^2(12) = 71.2$, $p < .000$.				
* $p < .05$, ** $p < .01$, *** $p < .001$.				

3.2. Multinomial logistic regression analysis, reference category: mastery

The model with age and sex was significantly better than the model without these predictors, $\chi^2(9) = 65.5$, $p < .000$. According to Nagelkerke's measure, age and sex explained 7.5% of the variance in goal orientation.

3.2.1. Mastery vs. work-avoidant

There was no interaction effect between age-group and sex (Wald $\chi^2(1) = .860$, $p = .354$). Main effects were found both for age ($b = -1.240$, Wald $\chi^2(1) = 30.1$, $p < .000$, $\text{Exp}(B) = .289$) and sex ($b = .922$, Wald $\chi^2(1) = 18.7$, $p < .000$, $\text{Exp}(B) = 2.51$). The odds ratio for age showed that when age-group changed from young (0) to old (1), the change in the odds of being work-avoidant rather than mastery oriented was 0.29. In other words, the odds of young adolescent to be mastery oriented than work-avoidant were $1/0.29 = 3.45$ times more than for older adolescents. This shows that adolescents aged 10–14 years were more likely than older adolescents to be mastery oriented than work-avoidant. Furthermore, girls were more likely than boys to be mastery oriented than work-avoidant. The odds ratio showed that as sex changed from male (0) to female (1), the change in the odds of being mastery rather than work-avoidant was 2.51.

3.2.2. Mastery vs. performance-avoidant

A main effect was found for age ($b = -.677$, Wald $\chi^2(1) = 12.4$, $p < .000$, $\text{Exp}(B) = .508$). The odds of being mastery rather than performance-avoidant oriented was $1/0.51 = 1.97$ times more for the younger adolescents than the older adolescents. This shows that 10–14 year old adolescents were more likely than older adolescents to endorse mastery goals than performance-avoidant goals. No sex effects ($b = -.099$, Wald $\chi^2(1) = 0.26$, $p > .05$) neither interaction effects (Wald $\chi^2(1) = .214$, $p = .644$) were found.

3.2.3. Mastery vs. performance-approach

A main effect was found for age ($b = -.487$, Wald $\chi^2(1) = 8.18$, $p = .004$, $\text{Exp}(B) = .615$), indicating that younger adolescents were more likely to be mastery than performance-approach oriented compared to older adolescents. As age-group changed from young (0) to old (1), the change in the odds of being mastery rather than performance-approach oriented was 0.62. Thus, the odds that a young adolescent was mastery rather than performance-approach oriented were $1/0.62 = 1.63$ times more than for an older adolescent. There was a main effect of sex ($b = .466$, Wald $\chi^2(1) = 7.48$, $p = .006$, $\text{Exp}(B) = 1.59$). As sex changed from male (0) to female (1), the change in the odds of being mastery rather than performance-approach was 1.59. This indicates that girls were more likely to endorse mastery than performance-approach goals. There were no interaction effects (Wald $\chi^2(1) = 3.47$, $p = .06$).

3.3. Multinomial logistic regression analysis, reference category: performance-avoidant

The model with age and sex was significantly better than the model without these predictors, $\chi^2(9) = 65.5$, $p < .000$. According to Nagelkerke's measure, age and sex explained 7.5% of the variance in goal orientation.

3.3.1. Performance-avoidant vs. performance-approach

There was no interaction between age-group and sex (Wald $\chi^2(1) = 1.12$, $p = .289$). Age-group did not show a main effect in the contrast performance-approach and performance-avoidant orientation ($b = .190$, Wald $\chi^2(1) = .796$, $p > .05$). There was a main effect of sex ($b = .564$, Wald $\chi^2(1) = 7.04$, $p = .008$, $\text{Exp}(B) = 1.76$). As sex changed from male (0) to female (1), the change in the odds of being performance-avoidant rather than performance-approach was

1.76. Thus, girls were more likely to be performance-avoidant than performance-approach oriented.

3.3.2. Performance-avoidant vs. work-avoidant

There were main effects of age ($b = -.563$, Wald $\chi^2(1) = 4.68$, $p = .031$, $\text{Exp}(B) = .569$) and sex ($b = 1.02$, Wald $\chi^2(1) = 17.1$, $p < .000$, $\text{Exp}(B) = 2.78$), showing that older adolescents and boys were more likely to be work-avoidant than performance-avoidant. As age-group changed from young (0) to old (1), the change in the odds of being performance-avoidant rather than work-avoidant was 0.57. Thus, the odds of a young adolescent to be performance-avoidant oriented than work-avoidant were $1/0.57 = 1.76$ times more than for an older adolescent. For sex, the odds ratio showed that as sex changed from male (0) to female (1), the change in the odds of being performance-avoidant rather than work-avoidant was 2.78. There was no interaction between age-group and sex (Wald $\chi^2(1) = 1.31$, $p = .252$).

3.4. Multinomial logistic regression analysis, reference category: performance-approach

The model with age and sex was significantly better than the model without these predictors, $\chi^2(12) = 71.2$, $p < .000$. According to Nagelkerke's measure, age and sex explained 8.2% of the variance in goal orientation.

3.4.1. Performance-approach vs. work-avoidant

An interaction effect between age and sex was found ($b = -1.06$, Wald $\chi^2(1) = 4.71$, $p = .030$, $\text{Exp}(B) = .345$). The odds ratio showed that as sex changes from male (0) to female (1) in combination with a change from the young (0) to the older (1) age-group, the change in the odds of being work-avoidant compared to performance-approach was 0.35. In other words, when the adolescent transits from the young to the older age-group, boys are $1/0.35 = 2.90$ times more likely than girls to be work-avoidant rather than performance-approach. Thus, older boys were more likely than younger boys to endorse work-avoidant goals than performance-approach goals.

4. Discussion

This study examined sex differences in goal orientations of young (10–14 years) vs. older (14–19 years) adolescents using vignettes as an assessment instrument. The results indicated that mastery and performance-avoidant orientations were more prominent in girls than in boys. The chance that students endorsed work-avoidant or performance-approach goals was larger for boys than for girls. With respect to age, it was shown that the chance of endorsing mastery goals compared to any other goal was larger in young adolescents than in older adolescents. Likewise, older adolescents had a higher chance than younger adolescents to be work-avoidant than mastery or performance-oriented.

Importantly, the vignette approach provided additional information about the prevalence of goals students primarily endorse. Our results show both age and sex differences in mastery goals. Girls were more likely than boys to endorse mastery goals: 48% of the girls compared to 39% of the boys. This is in line with some (Steinmayr et al., 2011) but not all (Freudenthaler et al., 2008; Steinmayr & Spinath, 2008) previous studies. With respect to age, our results extend previous evidence of decreases in mastery orientation in students aged 6–15 years (Wang & Pomerantz, 2009; Wigfield & Cambria, 2010), showing that the prevalence of mastery goals continues to decrease even after age 14 (from 52% to 36%). Thus, interventions aimed at promoting mastery goals should preferably be implemented as early as possible, at least before 14 years of age.

Opposite to the age-related decreases in mastery goals, work-avoidant goals were more prevalent among 14–19 year olds than younger counterparts (18% vs. 8%). This may suggest that with age, students'

primary goal shifts from mastery to work-avoidant. This seems particularly true for boys: one of four boys (27%) aged 14–19 years considered himself work-avoidant, which was more than twice as large compared to girls (12%). These results concretize previous findings that older adolescents and boys were more likely to be work-avoidant (Freudenthaler et al., 2008; Steinmayr & Spinath, 2008; Steinmayr et al., 2011). Work-avoidant goals have been related to less adaptive academic outcomes (Wigfield & Cambria, 2010). Therefore, the higher frequency of work-avoidant goals in boys aged 14–19 years may explain the gender gap in achievement, and indicates a need for intervention in this specific population.

Sex differences were also found in performance goals. Performance-approach goals were more prevalent in boys (28%) than girls (22%), whereas performance-avoidant goals were more often reported by girls (20%) than boys (14%). Thus, one fifth of all participants indicated that they were focused on extrinsic rewards and sensitive to judgments of their performance. This could have beneficial short-term effects, i.e., good grades, but negative long-term effects, i.e., poor retention or mastery of study materials. Further, one of five girls worries about making mistakes in the classroom, which is likely to affect their school performance. Therefore, teachers should select their evaluation measures carefully. Competitive assignments with a focus on comparisons within a class of students may increase the motivation of performance-approach students, but may hold back performance-avoidant students.

Previous research has shown that goal orientations can be influenced by changing the classroom goal structure (Luo, Hogan, & Paris, 2011; Meece, Anderman, & Anderman, 2006). When teachers emphasized the importance of mastery of the study material, more students endorsed a mastery orientation. Likewise, performance goals became more prominent when teachers emphasized the importance of good grades (Luo et al., 2011). Thus, role models like teachers (Murayama & Elliot, 2009) but also parents (Ginsburg & Bronstein, 1993; Meece, Glienke, & Burg, 2006b) and peers (Van Houtte, 2004; Warrington, Younger, & Williams, 2000) have been shown to influence the type of goal orientation. Sex differences in goal orientations may therefore be explained by differential approaches and expectations for boys and girls in the classroom. Yet, next to social influences, biological factors could also be responsible for sex differences in goal orientations. Sex differences in interest, activities and personality variables have been explained by early sex differences in androgens (Berenbaum, 1999). Also, individual differences in rate of brain development could be responsible for sex differences (Giedd, 2008; Lenroot et al., 2007). In particular, the interplay between these possible explanations warrants further research.

Although the order of the vignettes was fixed for all participants, order effects were not likely, since the mastery vignette was selected most often even though it was presented as one of the final options. Yet, generalization to the whole student population should occur carefully, as our sample was homogeneous with respect to LPE, ability level and ethnicity. Further, as participation was on voluntary basis, the present sample might give an underestimation of the actual prevalence of work-avoidant students. Further, our sample size was too limited (Kreft, 1996) to analyze school and class differences in classroom goal structure. Additionally, the reported age effects could be confounded with potential effects of the two different school forms (primary and secondary school), as the younger age-group included students from both schools. Furthermore, students may change their goals per school subject or endorse multiple goals simultaneously (Meece, Glienke, & Burg, 2006b). This was not addressed in the present study.

In conclusion, this study expands our understanding of sex differences in goal orientations during adolescence. Assessing goals with vignettes has the advantage of minimizing the chance of response biases. Furthermore, it provides additional information about the prevalence of the different goals which is much more revealing for educational practice than dimensional scores derived from questionnaires.

In general, our results showed that boys endorsed less adaptive goals, which may be a possible factor explaining their lower academic achievement compared to girls.

Appendix A

Mastery vignette

I am very curious and I like learning new material. A lot of subjects in school interest me. Of course I feel good when I receive a good grade, but I find mastering the material the most important thing.

Work-avoidant [lazy] vignette

I do not think it is very important to put much effort in school. I do not like to learn. I don't feel like working hard to receive good grades. Therefore, I sometimes fail to do my homework.

Work-avoidant [indifferent] vignette

I do not put much effort in school. Most often, I do not make my homework, because I find other activities more important than learning. I do not like to learn new material. Grades are not important to me.

Performance-approach vignette

In order to show my abilities, I want to receive good grades. I engage in learning because I want to receive higher grades than my classmates. I feel good when I am doing better than others. I think it is not so important to understand the material, as long as I receive good grades.

Performance-avoidant vignette

I think it is important to avoid looking stupid. Therefore, I worry when answering questions in the classroom and I worry when making a mistake. I want to avoid others thinking of me that I do not understand the material.

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