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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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1. Introduction

Across countries, there are differences in boys' and girls' academic performance in the advantage of girls (van Langen, Bosker, & Dekkers, 2006). One factor that may possibly contribute to the gender gap in achievement is a difference in motivation for learning. Goal theory is one of the most prominent and widely studied theories in motivation research (Dweck, 1986). It concerns the reasons to engage in learning activities and conceptualizes motivation as the striving to reach goals (Dweck, 1986). Students set different goals to guide their learning approach, i.e., they have different *goal orientations*. The goal orientation a student adopts has implications for their academic achievement (Steinmayr, Bipp, & Spinath, 2011) and a wide range of academic behaviours, e.g., deep/surface processing, metacognitive skills, learning strategies or effort (Bong, 2009; Daniels et al., 2008; Elliot, McGregor, & Gable, 1999; Sungur, 2007; Vansteenkiste, Sierens, Soenens, Luyckx, & Lens, 2009; Wang & Pomerantz, 2009; Wolters, 2004). Goal orientations have shown potential to explain sex differences in school achievement (Freudenthaler, Spinath, & Neubauer, 2008; Steinmayr & Spinath, 2008, 2009). Therefore, the rationale for the current study was to investigate sex differences in goal orientations in an adolescent sample.

Commonly, goal orientations are categorized into four different types, namely mastery, work-avoidant and two performance goals (see Table 1) (Dweck, 1986; Elliot, et al., 1999). Students who endorse *mastery* goals consider learning and the development of new skills as ends in themselves. These students focus on deep understanding and gaining insight into the study material. *Work-avoidant* students on the other hand do not like to engage in learning activities and invest as little effort as possible. Furthermore, *performance goals* have been distinguished. Performance oriented students do not focus primarily on the content of the study material. Rather, they focus on extrinsic rewards and demonstrating superior ability compared to others. These students are sensitive to judgments of their performance. There are two types of performance goals, i.e., approach and

avoidance goals (Elliott & Church, 1997; Elliott & Harackiewicz, 1996). Performance-approach goals refer to the aim to demonstrate superior ability. These students focus on receiving rewards for their efforts. Students with a performance-avoidant goal orientation primarily engage in learning activities to avoid failures, embarrassment or punishment in the classroom. They strive to avoid being seen as a poor performer. Of these four types of goals, mastery goals seem to be most beneficial in terms of strategy use and academic achievement (Elliot, 1999; Kaplan, 2010; Elliot & Harackiewich, 1996; Meece, Glienke, & Burg, 2006; Wigfield & Cambria 2010; Steinmayr, Bipp & Spinath 2010).

Though goal orientations are known to influence academic performance, little is known about the prevalence of the various goal orientations among boys and girls. During adolescence, mastery goals were found to decrease with age (Wigfield & Cambria, 2010). There is some evidence that boys aged 13-17 years endorse work-avoidant goals more often than girls of the same age (Freudenthaler, et al., 2008; Steinmayr, et al., 2011; Steinmayr & Spinath, 2008). With respect to sex differences in mastery and performance goals during adolescence, literature is less consistent (Freudenthaler, et al., 2008; Meece, et al., 2006). Inconsistencies between studies have been attributed to differences in participant characteristics (Meece, et al., 2006), for instance age, socio-economic status (SES), ability level and ethnicity, indicating the need to control for these factors.

Yet, inconsistencies in results may also arise as a result of using different assessment instruments for goal orientations. Goal orientations are usually measured with multiple items on Likert-scale questionnaires, in which sum scores are calculated for each goal (Wigfield & Cambria, 2010). Yet, these types of questionnaires may have some weaknesses, as Van der Sluis, Vinkhuyzen, Boomsma and Posthuma (2010) recently showed. They found that some items used to measure goal orientations were biased for sex. This signifies that the individual items did not relate to the same underlying construct for boys and girls. The sex-related item bias led to biases in sum scores and consequently, to either over- or underestimations of the total effect size of sex differences. This may explain why studies using different questionnaires for goal orientations yielded dissimilar results.

Therefore, the current study proposes a new methodology to assess goal orientations. Respondents were asked to read short characterizations, or *vignettes*, of students who differ in goal orientation. Each vignette reflected student behavior of one of the four goal orientations. The vignettes were put together based on a goal orientation questionnaire by Simons, Dewitte & Lens (2004). Respondents were asked to indicate which of the students they resembled most. Similar approaches have been used in health psychology, for instance by De Vugt and colleagues (2004), who described different types of caregiver management strategies in dementia. The vignette approach is particularly promising for adolescent research, because it is targeted to adolescents' perspectives. Comparison and identification with peers occurs very naturally during adolescence, when students become increasingly occupied with their role and social position (Brown, 2004). It is easier for adolescents to indicate which peer they identify the most with, than to give a scaled rating of their own behavior on multiple items. Vignettes may therefore yield a more valid estimate of the goals adolescents endorse when compared to the traditionally used scores on questionnaires.

Additional advantages of vignettes are that the single response option eliminates biases related to different response styles, e.g. acquiescence bias (tendency to agree with items) or extremity bias (tendency to choose the extremes of a rating scale). Furthermore, the implicit message of vignettes is that there are different types of students, without valuing which type is best. This makes every response option justifiable and minimizes social desirable responses. Next to these methodological advantages, the strength of this approach is that it provides information about the prevalence of each goal orientation, which is relevant for educational practice. Information about the amount of students in each goal orientation has more practical value for teachers than the traditional dimensional scores yielded by Likert scale questionnaires.

In conclusion, the present study was designed to increase knowledge about sex differences in goal orientations. Participants read vignettes of students with different goal orientations and indicated which student they resembled the most. Boys and girls from two age groups (10-14 years old versus 14-19 years old adolescents) were compared. Participants were comparable in ability level

and were of the same ethnicity. Level of Parental Education (LPE, as a proxy of SES) was included as a covariate because this factor has shown to moderate sex effects (Meece, et al., 2006). We expected that boys were more likely than girls to endorse work-avoidant goals but less likely to endorse mastery goals. With respect to age, a general decrease in mastery goals with age was expected. We had no a priori hypotheses about age and sex differences in performance goals, or age differences in work-avoidant goals.

<Insert Table 1 about here>

2. Method

2.1 Participants

The sample included 910 adolescents (45.2% boys; 98% Dutch nationality), ranging in age between 10.2 and 19.2 years. Students from Grade 5 and 6 (primary school) and Grade 7 to 12 (secondary school) were approached for participation in this study. All secondary school students were enrolled in one of the two highest educational tracks in the Dutch educational system, which are higher general secondary education (abbreviation in Dutch: '*havo'*) and pre-university education (abbreviation in Dutch: '*vwo'*). Havo and vwo differ in level of difficulty and prepare for different types of tertiary education: a havo diploma gives access to professional education programmes, whereas a vwo diploma also allows entry into university. Of the 926 students originally participating in this research, 16 participants had to be excluded due to missing data on either goal orientation or LPE, resulting in a final sample of 910 adolescents. LPE was low/medium in 38% of and high in 62% of the participants. 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).

2.2 Procedure

This study is part of a larger research project called *'Voorsprong',* which is a large cross-sectional study on development during adolescence. The study was approved by the ethical committee of VU University Amsterdam. Participants were recruited from six primary schools and four secondary schools in the south-east of the Netherlands. Information about the study was provided by letters to students and their parents. Both students and parents were asked to give informed consent. Parents were requested to return a questionnaire on background characteristics. Participating students completed a questionnaire in the classroom, during a regular school hour, under supervision of two trained researchers. The researchers gave instructions and checked every questionnaire on completeness when it was handed in. Response rate was about 30%.

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 of 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

To assess goal orientations, we developed short characterizations, or *vignettes* of students that differed in goal orientation. We distinguished mastery students, two work-avoidant students (one best described by 'lazy' and the other one by 'indifferent about school'), performance-approach students and performance-avoidant students. The mastery and performance vignettes were based on a questionnaire by Simons, Dewitte & Lens (2004). The work-avoidant vignettes were designed for this study. A full description of the vignettes can be found in the Appendix. Participants had to select the vignette that reflects the goal orientation they mainly endorse for all academic activities.

2.4 Data analysis

The frequency of the work-avoidant [indifferent] type was very low (1,5%). Therefore, data of the work-avoidant [indifferent] type was combined with the work-avoidant [lazy] type, 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 (χ^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. In order to analyze all possible contrasts between the four goal orientations, the regression analysis was repeated with three different goals as reference category. Independent variables in the regression model were age group and sex. LPE as a proxy of socio-economic status was included as a covariate. 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 set at p=0.05.

3. Results

3.1 Descriptive statistics

An analysis of frequency showed the percentages of students in each of the four goal orientations (see Figure 1). In both age groups, the percentage of mastery oriented students was the highest. Mastery goals were particularly prominent in the younger age group (10-14 years): 47% of all boys and 59% of all girls in this age group endorsed this orientation. Thus, about half of the students between 10 and 14 years of age considered themselves mastery oriented. In the older age group (14-19 years), these percentages were a bit 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 girls (12%) from the same age.

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% versus 14%).

<Insert Figure 1 about here>

The significance of these age and sex differences was examined using multinomial logistic regression analyses, of which the results are presented in Table 2.

<Insert Table 2 about here>

3.2 Multinomial logistic regression analysis, reference category: Mastery orientation

3.2.1 Mastery versus Work-avoidant orientation

There was no interaction effect between age group and sex. Main effects were found both for age (b = -1.240, Wald $\chi^2(1) = 30.1$, p = .000, Exp(B) = .289) and sex (b = .922, Wald $\chi^2(1) = 18.7$, p = .000, Exp(B) = 2.51). This shows that young adolescents (10-14 years) were more likely than older adolescents (14-19 years) to be mastery oriented than work-avoidant. Furthermore, girls were more likely than boys to be mastery oriented than work-avoidant.

3.2.2 Mastery versus Performance-avoidant orientation

A main effect was found for age (b = -.677, Wald $\chi^2(1) = 12.4$, p = .000, Exp(B) = .508). This shows that young adolescents (10-14 years) were more likely than older adolescents (14-19 years) to endorse a mastery orientation than a performance-avoidant goal orientation. No sex effects (b = -.099, Wald $\chi^2(1) = 0.26$, p >.05) neither interaction effects were found.

3.2.3 Mastery versus Performance-approach orientation

A main effect was found for age (b = -.487, Wald $\chi^2(1) = 8.18$, p = .004, Exp(B) = .615), indicating that younger adolescents were more likely to be mastery than performance-approach oriented compared to older adolescents. There was a main effect of sex (b = .466, Wald $\chi^2(1) = 7.48$, p = .006, Exp(B) = 1.59), indicating that girls were more likely to endorse a mastery orientation than performance-approach orientation. There were no interaction effects.

3.3 Multinomial logistic regression analysis, reference category: Performance-avoidant orientation

3.3.1 Performance-avoidant versus Performance-approach orientation

There was no interaction effect between age group and sex. 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 for sex (b = .564, Wald $\chi^2(1) = 7.04$, p = .008, Exp(B) = 1.76), indicating that girls were more likely to be performance-avoidant than performance-approach oriented.

3.3.2 Performance-avoidant versus Work-avoidant orientation

There were main effects for age (b = -.563, Wald $\chi^2(1) = 4.68$, p = .031, Exp(B) = .569) and sex (b = 1.02, Wald $\chi^2(1) = 17.1$, p = .000, Exp(B) = 2.78), showing that older adolescents and boys were more likely to be work-avoidant than performance-avoidant. There was no interaction effect between age group and sex.

3.4 Multinomial logistic regression analysis, reference category: Performance-approach orientation

3.4.1 Performance-approach versus Work-avoidant orientation

An interaction effect between age and sex was found (b = -1.064, Wald $\chi^2(1) = 4.71$, p = .030, Exp(B) = .345), indicating that for boys, there is an effect of age: older boys were more likely than younger boys to endorse a work-avoidant goal orientation than a performance-approach orientation.

4. Discussion

This study examined sex differences in goal orientations of young (10-14 years) versus older (14-19 years) adolescents using vignettes as assessment instrument. The results indicate 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 a mastery orientation compared to any other goal orientation was larger in young adolescents than in older adolescents. Likewise, older adolescents had a higher chance than the young 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. This may be much more revealing for educational practice than the dimensional scores derived from traditional questionnaire approaches. Our results show both age and sex differences in mastery goals. 48% of the girls identified with the mastery student, compared to 39% of the boys. Thus, girls were more likely than boys to endorse mastery goals. This is in line with results from Steinmayr, Bipp and Spinath (2011). On the other hand, Freudenthaler (2008) and Steinmayr and Spinath (2008) did not find this sex effect. With respect to age, our results extend previous evidence of decreases in mastery orientation between 6 and 15 years of age (Wang & Pomerantz, 2009; Wigfield & Cambria, 2010). Our data showed that until 19 years of age, mastery goals were less often endorsed (52% of the young adolescents versus 36% of the older adolescents). Thus, when trying to prevent decreases in mastery orientation, we would suggest to intervene as early as possible, at least before 14 years of age.

Opposite to the changes that occur in mastery goals with age, we found an increase in work-avoidant goals with age. Work-avoidant goals were more often endorsed by 14-19 year old adolescents than 10-14 year old adolescents (18% versus 8%). This may suggest that with age, students' primary goal changes from mastery to work-avoidant. This seems particularly true for boys. One of four boys (27%) aged between 14-19 years considers himself work-avoidant. The prevalence

of work-avoidant goals in boys of this age 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, et al., 2011; Steinmayr & Spinath, 2008). Work-avoidant goals have been related to less adaptive academic outcomes (Wigfield & Cambria, 2010), indicating a need for intervention in this specific population. The higher frequency of less adaptive goals in boys aged 14-19 years may explain why boys generally perform worse academically than girls of the same age. Yet, more research is needed to investigate the exact relation between sex differences in goal orientations and academic performance.

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 out of five students indicated that he or she is sensitive to judgments of their performance and focused on extrinsic rewards. This could have beneficial short-term effects, i.e., good grades, but negative long-term effects, i.e., poor retention or mastery of study material. The results stress the need for teachers to be alert of fear of failure in girls. 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 it is possible to influence goal orientations by changing the school environment, or *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, et al., 2006) and peers (Van Houtte, 2004; Warrington, Younger en 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). Thus far, the underlying mechanism of age and sex differences in goal orientations remains poorly understood. In particular, the interplay between the possible explanations warrants further research.

The vignette approach provides valuable information about the number of students in each goal orientation. Yet, results should be interpreted carefully when trying to generalize to the whole student population. Our study provides information about goal orientations in a sample which is homogeneous with respect to age, 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. Another consideration that should be taken into account when interpreting the results, is that students may change their goals per school subject or endorse multiple goals simultaneously (Meece, et al., 2006). As a result, sex differences in goal orientations may vary per school subject. This was not addressed in the present study, since the aim was to assess differences between boys and girls in their overall, general attitude towards learning.

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 bias occurring and provides additional information about the prevalence of the different goal orientations. Furthermore, it is much more revealing for educational practice than dimensional scores derived from questionnaires. In general, our results show that boys endorse less adaptive goal orientations, which may be a possible factor explaining their lower academic achievement compared to girls.

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Appendix

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.

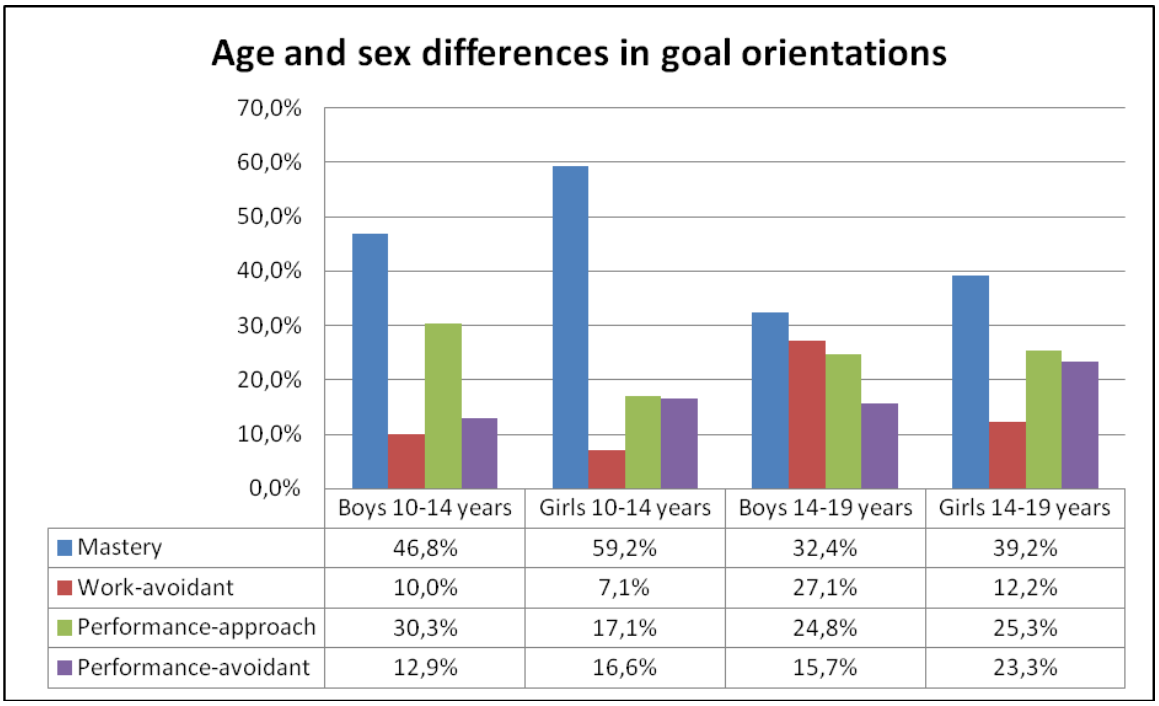
Performance-avoidant vignette

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.

Figure

Figure 1

Descriptives



	Boys 10-14 years	Girls 10-14 years	Boys 14-19 years	Girls 14-19 years
Mastery	46,8%	59,2%	32,4%	39,2%
Work-avoidant	10,0%	7,1%	27,1%	12,2%
Performance-approach	30,3%	17,1%	24,8%	25,3%
Performance-avoidant	12,9%	16,6%	15,7%	23,3%

Table

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

Table 2

Results Multinomial Logistic Regression

		95% CI for Odds Ratio		
	B (SE)	Lower	Odds Ratio	Upper
Mastery" vs. Work-avoidant				
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
Mastery" vs. Performance-approach				
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
Mastery" vs. Performance-avoidant				
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

Note: R^2= .069 (Cox & Snell), .075 (Nagelkerke). Model $\chi^2(9) = 65.5$, $p < .000$. * $p < .05$, ** $p < .01$, *** $p < .001$.
" = reference category

		95% CI for Odds Ratio		
	B (SE)	Lower	Odds Ratio	Upper
Performance-avoidant" vs. Performance-approach				
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
Performance-avoidant" vs. Work-avoidant				
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: R^2= .069 (Cox & Snell),.075 (Nagelkerke). Model $\chi^2(9) = 65.5$, $p < .000$. * $p < .05$, ** $p < .01$, *** $p < .001$.
" = reference category

		95% CI for Odds Ratio		
	B (SE)	Lower	Odds Ratio	Upper
Performance-approach" vs. Work-avoidant				
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: R^2= .075 (Cox & Snell), .082 (Nagelkerke). Model $\chi^2(12) = 71.2$, $p < .000$. * $p < .05$, ** $p < .01$, *** $p < .001$.
" = reference category

***Highlights**

Highlights

- Vignettes were used to assess the prevalence of goal orientations during adolescence
- Adolescent girls more often than boys endorsed mastery or performance-avoidant goals
- Work-avoidant and performance-approach goals were more prominent in boys than girls
- With age, the frequency of mastery goals decreased whereas work-avoidant goals increased
- At age 14-19 years, work-avoidance was more than twice as common in boys