Original Article

Yes I Can!

Effects of Gender Fair Job Descriptions on Children's Perceptions of Job Status, Job Difficulty, and Vocational Self-Efficacy

Dries Vervecken and Bettina Hannover

Department of Education Science and Psychology, Freie Universität Berlin, Germany

Abstract. Many countries face the problem of skill shortage in traditionally male occupations. Individuals' development of vocational interests and employment goals starts as early as in middle childhood and is strongly influenced by perceptions of job accessibility (status and difficulty) and self-efficacy beliefs. In this study, we tested a linguistic intervention to strengthen children's self-efficacy toward stereotypically male occupations. Two classroom experiments with 591 primary school students from two different linguistic backgrounds (Dutch or German) showed that the presentation of occupational titles in pair forms (e.g., Ingenieurinnen und Ingenieure, female and male engineers), rather than in generic masculine forms (Ingenieure, plural for engineers), boosted children's self-efficacy with regard to traditionally male occupations, with the effect fully being mediated by perceptions that the jobs are not as difficult as gender stereotypes suggest. The discussion focuses on linguistic interventions as a means to increase children's self-efficacy toward traditionally male occupations.

Keywords: gender stereotypes, gender fair language, accessibility of an occupation, vocational self-efficacy beliefs, career aspirations

The lack of qualified workers for traditionally male occupations, like in the STEM-field (Science Technology Engineering and Mathematics), remains a worldwide problem (World Economic Forum, 2010). During the last decade, Europe has seen a further decrease in the percentage of STEM-related high school and university degrees (OECD-EUROSTAT, 2012 as cited in VRWI, 2012): Even so in this domain many job offers cannot be filled, both young men and women tend to choose a non-STEM-related education, running the risk of finding no adequate employment.

While vocational development constitutes a lifelong process, the nascent period is in childhood (e.g., Hartung, Porfeli, & Vondracek, 2005, 2008; Watson & McMahon, 2005, 2007): Primary school children develop early occupational aspirations which are predictors of later academic and professional choices (e.g., Magnuson & Starr, 2000; Seligman, Weinstock, & Heflin, 1991; Trice, 1991; Trice & McClellan, 1993, 1994; Weisgram, Bigler, & Liben, 2010). An important reason why the majority of children do not aspire for STEM jobs has to do with their expectations of being successful in these particular jobs. Bandura's (1995) work suggests that self-efficacy, that is, a person's belief as regards being able to successfully master the challenges associated with a particular job, strongly impacts educational and occupational aspirations and choices. For instance, Bandura, Barbaranelli, Caprara, and Pastorelli (2001) found children's self-efficacy beliefs to be important predictors of their academic and career aspirations, even after controlling for their actual scholastic performance.

Similarly, in their expectancy model of achievement-related choices Eccles and her colleagues (Eccles, 2007, 2011; Eccles & Wigfield, 1995) have assumed that occupational aspirations rest upon expectancies of success and task values: The stronger individuals perceive their ability to do well in an occupation, the less difficult they consider the occupation to be for them, and the more value they attribute to the occupation under consideration (intrinsic interest, extrinsic utility value, importance, subjective costs), the more probable it is that they will strive for that occupation.

Hence, interventions aiming at increasing enrollment in traditionally male occupations such as STEM-related jobs might be particularly effective when focused on boosting self-efficacy beliefs and when deployed during the primary school years. This is especially true as self-efficacy is a crucial concept which not only influences vocational choices but also impacts actual educational achievement: Students with high self-efficacy beliefs perform better in school than

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students with low self-efficacy beliefs (for reviews see Multon, Brown, & Lent, 1991; Richardson, Abraham, & Bond, 2012; Robbins et al., 2004). Conversely, low self-efficacy beliefs have been related to negative outcomes such as school failure (Bandura, 1995; Bandura et al., 2001). In this paper we want to investigate gender fair language as a tool to promote children's self-efficacy toward traditionally male occupations. We also want to shed light on the mechanism via which the use of gender fair language may impact children's self-efficacy beliefs toward gendered occupations.

Gendered Occupational Stereotypes

One of the causes for children's low self-efficacy beliefs toward stereotypically male jobs is the operation of gender stereotypes (Eagly, 1987). Traditionally, male occupations are perceived as difficult and as high in status and thus as less accessible than other occupations. Gendered perceptions of occupations develop as children are repeatedly exposed to men and women acting in traditionally gender-typed occupational (and other social) roles (cf. Social Role Theory: Eagly, 1987; Eagly, Wood, & Diekman, 2000). As a result, children learn that on average, women work in lower status professions than men and maleness becomes associated with higher status and hence, higher difficulty of tasks, than femaleness (e.g., Alksnis, Desmarai, & Curtis, 2008; Furnham & Wilson, 2011; Liben, Bigler, & Krogh, 2001; West, Heilman, Gullett, Moss-Racusin, & Magee, 2012; Williams, Paluck, & Spencer-Rodgers, 2010).

Research on occupational stereotypes shows that individuals make generalizations about particular jobs, for instance, which kind of people work in these jobs, what kind of work they do, and how appropriate the job is for different social groups (Gottfredson, 1981). Male occupations are, by definition, associated with the male gender. Since males have greater economic and political power than females pan-culturally, already children associate male occupations with higher status and prestige, higher task difficulty, and lower subjective probabilities to attain them (e.g., Neff, Cooper, & Woodruff, 2007; Teig & Susskind, 2008). For instance, studies investigating the image of mathematics and science found school students to not only (implicitly and explicitly) associate them with maleness (e.g., Cvencek, Meltzoff, & Greenwald, 2011; Nosek, Banaji, & Greenwald, 2002; Plante, Théorét, & Favreau, 2009; Steffens & Jelenec, 2011; Steffens, Jelenec, & Noack, 2010), but also with higher difficulty (Hannover & Kessels, 2004; Kessels & Hannover, 2007; Kessels, Rau, & Hannover, 2006) – compared to subject domains related to languages or social sciences.

In her theory on the development of occupational aspirations in children Gottfredson (1981) coined the term "perceived accessibility of an occupation" to describe individuals' subjective judgments about how likely it is that they can enter a particular occupation. According to Gottfredson (2002), before the age of 13 children establish "tolerable effort boundaries," making them reject occupational alternatives that seem too high in status/prestige or pose too high a risk of failure because of their anticipated difficulty. Expressed in Gottfredson's terms, children of either gender can be assumed to perceive male occupations as less accessible than other jobs: They seem less within reach, both in terms of perceived status/prestige, as well as in terms of perceived difficulty or efforts required (cf. Gottfredson, 2002, 2005).

To summarize, one of the reasons why children infrequently aspire for traditionally male vocations is that these jobs are conceived of as less accessible, due to their high difficulty and status. The perception of difficulty and status is, however, not so much dependent on objective characteristics of these occupations but rather due to the operation of gender stereotypes. Therefore, influencing the gendered perceptions of traditionally male occupations may influence girls' and boys' perceptions of job accessibility (Gottfredson, 1981, 2005) and their self-efficacy beliefs (Chatard, Guimond, & Martinot, 2005) toward these occupations.

Language and Gendered Perceptions of Occupations

While changing the gendered perception of occupations has long been recognized as a key to making jobs connoted as male more appealing to young people (e.g., Hannover & Kessels, 2004; Kessels et al., 2006), few interventions have been investigated to tackle this issue (see Bailey & Nihlen, 1990; Barclay, 1974; Miller, 1986, for notable exceptions). One way of influencing gendered perceptions of occupations and thus promoting careers in traditionally male occupations may be via gender fair language. Recently, it has been shown that gender cues in language influence adults' (Stahlberg, Braun, Irmen, & Sczesny, 2007, for a review) and even children's (e.g., Vervecken, Hannover, & Wolter, 2013) gendered perceptions. However, little is known about the influence of gendered language on primary school children's self-efficacy beliefs regarding traditionally male occupations. In this paper we investigate whether making explicit reference to both genders when describing occupations to primary school children, by using pair forms (e.g., Ingenieurinnen und Ingenieure [female and male] engineers) rather than generic masculine forms (Ingenieure, plural for engineers), is beneficial to promote their self-efficacy toward traditionally male occupations. To foreshadow our argument, we predicted that the linguistic intervention would operate in the following manner: The explicit reference to both women and men implies that both genders could do the job (Stahlberg et al., 2007, for a review). This should strengthen perceptions of job accessibility, with this perception in turn strengthening children's self-efficacy beliefs toward the occupations.

Most languages, for instance Spanish, German, or French, are grammatical gender languages (see Prewitt-Freilino, Caswell, & Laakso, 2012), that is, they provide both a feminine and a masculine form for almost every personal noun (e.g., Lehrer und Lehrerin [male and female]

teacher). When referring to mixed gender groups of people or to groups whose gender composition is unknown or irrelevant, it is customary in grammatical gender languages to use masculines generically (e.g., Lehrer, to denote a group of male and female teachers). This linguistic convention has long been criticized for its inherent sexism (e.g., Bussmann, 1995; Trömel-Plötz, 1982): Psycholinguistic research has shown quite consistently that generic masculines trigger male-only associations and inferences, rather than gender balanced associations in recipients' mental representations (e.g., Braun, Gottburgsen, Sczesny, & Stahlberg, 1998; Heise, 2000, 2003; Rothmund & Scheele, 2004; Stahlberg & Sczesny, 2001; Stahlberg, Sczesny, & Braun, 2001; Vervecken et al., 2013; see Gygax & Gabriel, 2011, for a review). For instance, Gygax et al. (2012) asked their French participants to work on a word association task in which they had to decide whether a person introduced by a kinship term (e.g., aunt) could be part of a group represented by a role name presented in a generic masculine form (e.g., actors). Results showed that participants more easily associated the generic masculine role noun with male than with female kinship terms: "Incongruent" combinations between female kinship terms and generic masculine role nouns were more frequently rejected and endorsed more slowly than "congruent" combinations. Stahlberg and Sczesny (2001) asked their German-Speaking participants to write down the names of famous musicians or athletes, with instructions either provided in a generic masculine form (e.g., Musiker, Sportler; plural for musician, plural for athlete) or a pair form (e.g., Musikerin/Musiker; Sportlerin/Sportler [female and male] musician [female and male] athlete). Results clearly showed that participants who had received the role nouns in pair forms listed more female personalities than participants in the generic masculine condition.

Informed by such findings from psycholinguistic research, there have recently been efforts to introduce gender fair alternatives into official language, with guidelines for gender fair language forms published by numerous organizations and publishing companies (e.g., American Psychological Association [APA], 2009; Duden, 2006; European Commission, 2008). The utmost important guideline for gender fair language (cf. Duden, 2006; Hellinger & Bierbach, 1993) is the avoidance of generic masculines, achieved, for instance, by making the biological sex of the referent linguistically explicit through the use of pair forms.

Whereas most research to date regarding this issue has been conducted with adults, there is evidence suggesting that children's interpretations of occupations are also influenced by gender cues in language (Hyde, 1984; Liben Bigler, & Krogh, 2002; Schau & Scott, 1984; Scott, 1986; Vervecken et al., 2013). Liben and her colleagues (2002; Study 1) asked English-Speaking children aged 6–11 whether various job titles, which were either linguistically unmarked for gender (e.g., doctor), weakly marked for gender (e.g., postmaster), or strongly marked for gender (e.g., policeman), could be used to describe both male and female persons performing the job. When interpreting their findings, Liben and her colleagues (2002) came to conclude: "Analyses of responses to the unmarked titles demonstrate that some children do not understand that gender-neutral occupational titles are universally applicable to both men and women" (p. 816). It seems, job titles unmarked for gender (in a natural gender language like English) are not necessarily gender neutral – as is true for job titles described in the generic masculine (in grammatical gender languages): They more likely trigger male mental representations than gender balanced ones.

In a similar vein, Vervecken and his colleagues (2013) recently demonstrated that primary school children associate stereotypically male occupations presented in a pair form, rather than in a generic masculine form, more strongly with female jobholders. In a study by Hyde (1984) children were given a fictitious job description, "wudgemaker," with repeated reference to the jobholder by either the pronouns "he," "they," "he or she," or "she." Children's ratings of how well women could do the job were significantly affected by the pronoun, with children in the generic "he" condition considering women to be less capable than children in the remaining pronoun-conditions.

Feminization = Higher Job Accessibility?

The above-cited research suggests that explicit reference to both male and female jobholders in occupational titles coincides with some kind of "feminization" in the perception of that occupational group: Individuals are inclined to associate women more easily with these occupations and to believe that more women can succeed in these occupations (e.g., Stahlberg et al., 2007; Vervecken et al., 2013). Consequently, presenting stereotypically male occupations in pair forms might make these jobs appear more accessible in terms of reachable status and manageable difficulty level (Gottfredson, 1981, 2005).

Subjective job accessibility should be increased by making traditionally male jobs appear more within reach, that is, as not particularly unattainable in terms of difficulty level or status. To achieve this, in our study we explicitly referred to female and male jobholders (via pair forms rather than generic masculine forms) when describing stereotypically male occupations to children. Since the perceptions of high difficulty and high status are not inherent to traditionally male jobs themselves but result from gender stereotypes and occupational stereotypes, describing these jobs via explicit reference to both, males and females, should be effective in strengthening children's perceptions of accessibility of these occupations.

Indirect support for this assumption is provided by research showing that when children or adults are asked to indicate their perceptions of level of earnings (status) or levels of difficulty for different occupations and activities, stereotypically female activities and occupations receive systematically lower ratings than stereotypically male activities and occupations (e.g., Berscheid, 1993; Beyer, 1990; Bradley, 1989; Liben et al., 2001; Teig &

Susskind, 2008; Williams et al., 2010). For example, Williams and her colleagues (2010) demonstrated that adults tend to hold an automatic association linking men, more than women, with wealth (salary estimation effect). The authors emphasize that it is not people's knowledge of the pay gap which leads to differential estimates of men's and women's salaries but rather the presence of a general male-wealth stereotype – largely operating outside people's awareness – which causes the differential judgment of men's and women's wages. In the same vein, research findings from Neff et al. (2007) suggest that children aged 7–15 generally believe that men are granted more social status than females. Although this belief is amplified with age, it is already present in primary school children.

Further support for the assumption that explicit reference to female jobholders in stereotypically male vocations may lead to ascriptions of higher job accessibility (Gottfredson, 1981, 2005) comes from experimental studies which manipulated the gender of workers (e.g., Alksnis et al., 2008; Cejka & Eagly, 1999; Diekman & Eagly, 2000; Eagly & Steffen, 1984; Eagly & Wood, 1982; Furnham & Wilson, 2011; Hogue & Yoder, 2003; Johannesen-Schmidt, & Eagly, 2002; Kanekar, Maharukh, & Kolsawalla, 1989; Liben et al., 2001; Touhey, 1974). For instance, in a study by Liben and her colleagues (2001) primary school children were presented fictitious job descriptions which were combined with pictures of either a male or a female jobholder. Regardless of their gender, children ascribed lower earnings (status) and lower levels of difficulty to jobs when they had been presented with a female than a male jobholder.

These studies all suggest that perceptions of occupational status and difficulty are not inherently connected with the job itself but can at least be partially explained by gender stereotypes and occupational stereotypes. Against the background of these findings we speculated (a) that explicitly referring to females and males via pair forms when describing stereotypically male occupations may strengthen children's mental associations with female jobholders and thus their perceptions of accessibility (Gottfredson, 1981, 2005) of such jobs, and (b) that these effects should be observed in children of both genders.

Higher Job Accessibility = Self-Assurance?

Perceptions of increased job accessibility, as a result of describing traditionally male occupations in a pair form, should in turn strengthen children's self-efficacy expectations toward these jobs. Bandura (1995) defined self-efficacy as "the belief in one's capabilities to organize and execute the courses of action required to manage prospective situations" (p. 2). Job-related self-efficacy should be experienced to the extent that individuals think of themselves as meeting the demands (e.g., status, difficulty) of the job. So, if pair form descriptions coincide with the job appearing more accessible, then this should strengthen children's self-efficacy beliefs toward these occupations.

Support for this assumption comes from a study by Chatard and colleagues (2005). They presented a list of occupational titles to 15-year-old French-Speaking students either in generic masculines or in pair forms. Participants were then asked to indicate their level of confidence in passing the qualification examination required for the job. Results showed that both young men and women from the pair form condition felt more confident about passing the test than participants from the generic masculine condition. Whereas this study substantiates our assumption that boys' and girls' self-efficacy can be boosted when stereotypically male occupations are presented in pair forms, it did not test why this would be the case. We assume that the ascription of higher job accessibility mediates the effect of pair form use on self-efficacy beliefs.

Rationale and Overview of Our Studies

In sum, research suggests that perceptions of status and difficulty of different occupations as well as occupational self-efficacy beliefs are not inherent to these jobs themselves but can at least partially be explained by gender stereotypes and occupational stereotypes. Other research attests to gender information encoded in language influencing people's gendered perception of occupations. Tying these notions together, we aimed at testing the assumption that perceptions of status and difficulty, that is, of accessibility of stereotypically male occupations, can be influenced by the linguistic form used to describe them. The current research also aimed at revealing the interrelation between perceptions of job accessibility and self-efficacy beliefs. We tested the following hypotheses:

Hypothesis 1 (H1): The use of pair forms (compared to generic masculines) when describing stereotypically male occupations strengthens girls' and boys' perceptions of accessibility – in terms of reachable status and manageable difficulty – of these jobs.

Hypothesis 2 (H2): The use of pair forms (compared to generic masculines) when describing stereotypically male occupations promotes girls' and boys' vocational self-efficacy toward them.

Hypothesis 3 (H3): The positive impact of pair forms (compared to generic masculines) on girls' and boys' vocational self-efficacy is mediated by their perceptions of job accessibility – in particular job status and job difficulty.

Two experiments with primary school children ($N = 591$) were conducted to examine these hypotheses. Although we did not expect any gender-specific effects, given the lack of relevant research for this age group,

we also explored the possible differential influence of children's gender. We chose to test our hypotheses with primary school children between 6 and 12 years because this age phase is crucial in the development of gender stereotypes (Blakemore, Berenbaum, & Liben, 2009; Ruble, Martin, & Berenbaum, 2006), occupational aspirations (Hartung et al., 2005, 2008; Porfeli, Hartung, & Vondracek, 2008; Watson & McMahon, 2005), and of tolerable effort boundaries (Gottfredson, 2002). We also tested whether age might moderate the impact of our intervention on children's perceptions of job accessibility and reported self-efficacy beliefs.

To enhance the generalizability of our findings, we sampled children from two different linguistic backgrounds and investigated whether the pair forms versus generic masculines manipulation would have the same impact regardless of children's first language: About half of the children were from Germany and were native speakers of German. The other half of the children were from Belgium and were native speakers of Dutch. Both languages are grammatical gender languages and know generic masculines as well as pair forms.

In Experiment 1, we first explored the influence of pair form versus generic masculine job descriptions on children's perceptions of job status. Children were asked to estimate how much people earn (from "very little" to "very much"), as previous studies have done to measure occupational status or prestige (cf. Berscheid, 1993; Beyer, 1990; Bradley, 1989; Gottfredson, 1981, Gottfredson, 2005; Liben et al., 2001; Williams et al., 2010). In Experiment 2, we added other indicators of status (importance of the job), and indicators of perceived job difficulty and tested whether the effect of the linguistic intervention was mediated via perceptions of job status and job difficulty.

General Methodology

Procedure

Two quasi-experiments were designed in which existing class constellations were preserved, and the experimental manipulation (job titles in pair forms vs. job titles in generic masculines) was varied on the class level only. The experiments were conducted during regular school hours: A member of the research team went into classes and ran the experiment while the teacher remained in the back of the class. Because in both Belgium and Germany primary school teachers are almost exclusively female, we selected a female teacher within one school to give the instructions in all participating classes. The teacher presented the job titles with brief job descriptions to make sure that all children had the same job in mind. These descriptions were held constant across conditions (e.g., generic masculine condition (= control group): "Firemen are persons who extinguish fires," pair form condition (= experimental group): "Firewomen and firemen are persons who extinguish fires"). Job titles were presented one after another, with the children indicating their responses in a questionnaire immediately afterwards. While stereotypically male occupations were the primary focus, to provide children with a broader range of job descriptions and to disguise the purpose of the study, stereotypically female and gender-neutral occupations were included as filler items. The job descriptions differing in gender stereotypicality were orally presented by the teacher to the children in a random order. All occupational titles used in the two experiments are listed in the appendix.

Analysis

Since existing class constellations were preserved, we applied a standard linear regression model (total regression) with a standard error correction for complex data (Mplus5, Muthen & Muthen, 2007) instead of traditional MANCOVA analysis. Without this correction, standard errors would have been underestimated and significance tests would have been biased, given the complex data structure of pupils being nested in classes (Bryk & Raudenbush, 1992). All data were also analyzed using multilevel linear analysis to reflect the data's hierarchical structure. Results were the same as the ones reported with the standard error correction.

To test our assumption that the linguistic form (pair form or generic masculine) used in presenting occupational titles would impact children's perceptions of job accessibility and their vocational self-efficacy beliefs, we conducted separate multiple regression analyses for our three criterion variables: stereotypically male, female, and gender-neutral occupations. All categorical variables (linguistic intervention, participant gender, language) were effect coded (values −1 and 1) and the continuous variable (age) was centered (Aiken & West, 1991). The two effect coded variables, children's age, and the two-way interaction terms between children's gender and linguistic intervention, language and linguistic intervention as well as age and linguistic intervention were entered simultaneously.

Experiment 1

Participants

Participants were children (N = 435) attending classes 1–6 from a total of 24 different classes gathered from 2 different primary schools in Belgium (n = 212) and 2 different primary schools in Germany (n = 223). From the German schools, 113 pupils (60 female and 53 male) were assigned to the experimental group and 110 pupils (54 female and 56 male) to the control group. From the Belgium schools, 107 pupils (59 female and 48 male) were assigned to the experimental group and 105 pupils (60 female and 45 male) to the control group. Mean age of the children in the experimental group was 9 years and 3 months (SD = 1.7) and of the children in the control group 8 years and 9 months (SD = 1.8).

Table 1. Means and standard deviations (in parentheses) for status perceptions of male, female, and gender-neutral occupations according to experimental conditions in Experiment 1

		Occupation		
Condition	Gender	Male	Female	Neutral
GM	Boys	3.85 (0.45)	2.70 (0.54)	4.05 (0.69)
	Girls	3.76 (0.44)	2.89 (0.52)	4.01 (0.68)
PF	Boys	3.71 (0.45)	2.81 (0.62)	3.94 (0.70)
	Girls	3.69 (0.41)	3.00 (0.56)	3.93 (0.63)

Notes. GM = generic masculine; PF = pair form. Scale range = 1 = very little to 5 = very much.

Materials

Job Accessibility in Terms of Status

Job titles representing stereotypically male, female, and gender-neutral occupations were selected based on a list of role names which Gabriel, Gygax, Sarrasin, Garnham, and Oakhill (2008) and Irmen and Schumann (2011) had rated with reference to their perceived gender stereotypicality. From these lists we selected eight stereotypically male (< 30% women), five stereotypically female (> 70% women), and three gender-neutral (45–55% women) occupational titles and amended a description for each of them. One of the stereotypically male items was for instance: "Erfinderinnen und Erfinder: Personen, die neue Sachen entdecken" (female and male inventors, people who invent new things). An example for the stereotypically female occupations was: "Kosmetikerinnen und Kosmetiker, Leute, die andere hübsch machen" (female and male beauticians, people who make others more beautiful). Following each presentation of an occupation title by the teacher, children were asked: "How much do you think _____ get paid?" The answering scale ranged from 1 = *very little*, to 5 = *very much*. Children's responses were then aggregated to calculate three variables: perceived status of stereotypically male occupations (α = .78), stereotypically female occupations (α = .68), and gender-neutral occupations (α = .54). Means and standard deviations for the dependent variables are reported in Table 1.

Results

We expected that the presentation of stereotypically male job descriptions in linguistic pair forms would strengthen children's estimates of the jobs' accessibility. Since this effect was expected to come about by the stronger association of the job titles with female jobholders (triggered by the pair form presentation), it should appear in attenuated salary estimates. No such effect was expected to occur for stereotypically female or gender-neutral occupations.

Perceived Accessibility (in Terms of Status) of Stereotypically Male Occupations

Multiple regression analysis revealed a significant two-way interaction effect between linguistic intervention and children's gender, $b = -.02$, $\beta = -.07$, $t(428) = -2.02$, $p = .04$. Post hoc tests of the interaction showed that boys ascribed lower earnings to stereotypically male occupations in the pair form condition than in the generic masculine condition, $b = -.07$, $t(428) = -2.23$, $p = .02$. While the pair form intervention also tended to diminish girls' earning beliefs, this effect was not statistically significant, $b = -.03$, $t(428) = 0.89$, $p = .43$. Figure 1 visualizes this interaction. As a concomitant of this interaction, additionally, a marginally significant main effect for the linguistic intervention appeared, $b = -.04$, $\beta = -.10$, $t(428) = 1.72$, $p = .08$.

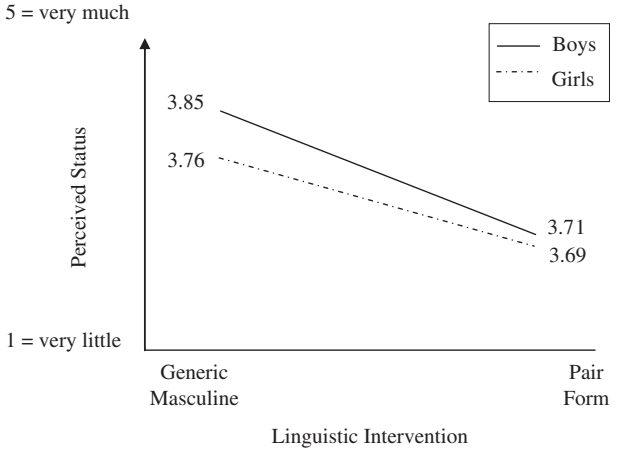

Figure 1. Perceived status of male occupations split by linguistic intervention groups and children's gender in Experiment 1.

Furthermore, the analysis revealed a significant main effect for age, $b = -.05$, $\beta = -.18$ $t(428) = 2.51$, $p < .001$: The older the children, the less money they believed people in stereotypically male occupations would earn. The analysis also showed a significant main effect of children's first language, $b = -.06$, $\beta = -.14$, $t(428) = 2.37$, $p = .02$. In general, Dutch-speaking children believed that persons in stereotypically male occupations would earn more money, compared to German-speaking children. There was also a significant main effect for children's gender, $b = -.03$, $\beta = -.07$, $t(428) = 2.51$, $p < .05$: On average, boys attributed higher earnings to stereotypically male jobs than girls.

Table 2. Predictors of perceived status of male, female, and neutral occupations in Experiment 1

	Occupation											
	Male				Female				Neutral			
	b	*SE* (*b*)	*β*	R^2	*b*	*SE* (*b*)	*β*	R^2	*b*	*SE* (*b*)	*β*	R^2
Intercept	3.758	.032			2.854	.035			3.961	.037		
LI	−.044†	.026	−.099		.050	.035	.086		−.006	.037	−.009	
Gender	.033*	.017	.073		−.090*	.031	−.156		.013	.041	.018	
Age	−.047*	.016	−.182		−.120*	.023	−.362		.118*	.024	.288	
L	−.061*	.026	−.136		−.112*	.039	−.194		.040	.036	.057	
LI × Gender	−.024*	.016	−.071		−.004	.032	−.006		−.032	.041	−.045	
LI × L	−.018	.034	−.038		−.059	.023	−.102		−.013	.036	−.018	
LI × Age	.011	.020	.041		.005	.023	.014		.026	.018	.070	
				.073*				.237*				.113*

Notes. Effect codes: LI = Linguistic intervention (generic masculine = −1, pair form = 1), Gender (girl = −1, boy = 1), L = Language (German = 1, Dutch = −1), Age is grand mean centered. Scale range = 1–5. *$p < .05$, †$p < .10$.

Perceived Accessibility (in Terms of Status) of Other Occupations

As expected, the linguistic intervention did not influence children's beliefs about earnings in stereotypically female and gender-neutral occupations (see Table 2 for an overview of all results).

Discussion

The primary purpose of Experiment 1 was to explore whether the use of pair forms (compared to generic masculine forms) when presenting occupations increases children's perceptions of accessibility (in terms of status) of stereotypically male occupations. The dependent measure was the level of income children believed the holders of certain occupations would earn. Our findings suggest that boys' perceptions of accessibility with regard to stereotypically male occupations were indeed affected by the linguistic intervention. Although girls also tended to ascribe lower earnings to stereotypically male occupations when they were presented in a pair form (compared to generic masculine form), this trend was not statistically significant. An explanation for why the linguistic intervention affected boys but not girls might lie in the way we operationalized accessibility. We asked children how much money they thought that workers in these occupations earn. A study by Weisgram and her colleagues (2010) showed that males (also including primary school children) but not females were more interested in an occupation if it was described as a high income job (compared to when the identical job was depicted as high in power, or as strongly associated with family or altruistic values). Similarly, in samples of children of about the same age as the girls and boys participating in our study, Teig and Susskind (2008) found that girls preferred feminine over masculine jobs, irrespective of status, while boys' preferences were influenced by both, the jobs' gender connotation and status. These findings suggest that boys are more sensitive to cues indicating status via earnings than girls, providing an explanation for why our intervention only worked for boys. At the same time, however, they also suggest that ascriptions of lower earnings not necessarily coincide with the perception of higher job accessibility; an interpretation which seems also plausible against the background of our finding that boys attributed higher earnings to stereotypically male jobs than girls. We therefore used additional indicators of job accessibility in Experiment 2.

Another explanation for why the linguistic intervention seemingly only impacted boys could be age-related. A main effect for children's age indicated that the younger children were, the more earnings they generally ascribed to occupations. After more closely examining our group compositions, it became apparent that by coincidence, girls in the pair form condition were significantly younger than girls in the generic masculine condition. This age imbalance between the groups might have neutralized the effect of the linguistic intervention on girls' perceptions of workers' earnings in stereotypically male occupations. In Experiment 2 groups were matched for age.

While the focus of our study was on the impact of the linguistic manipulation on the perception of stereotypically male occupations, we had included descriptions of female and gender-neutral jobs. In line with our notion that the effect on children's perceptions of job accessibility should come about via the "feminization" of traditionally male occupation, results demonstrated no impact of the linguist pair form intervention on stereotypically female and gender-neutral occupations. This pattern of findings suggests that our participants did in fact differentiate between the three kinds of occupations. Also, it is consistent with previous research showing that pair forms increase associations with women and foster gender balanced attitudes with regard to traditionally male occupations (e.g., Stahlberg et al., 2007; Vervecken et al., 2013).

In summarizing, Experiment 1 produced initial evidence for our assumption that when stereotypically male occupations were presented in a pair form rather than in a generic masculine form, ascriptions of earnings tended to be

attenuated. However, this effect was only due to the boys participating in our study. With Experiment 2, we wanted to replicate Experiment 1, while clarifying why the linguistic intervention did not have an impact on girls in our first study. First, to preclude that a potential effect of the intervention on girls would be nullified by age differences between experimental and control groups, in Experiment 2 we controlled for the possible confound of children's age. And second, supposing that possibly subjective job accessibility is not adequately or sufficiently described by income levels, we used a broader set of measures. More specifically, in addition to assumed earnings (cf. Berscheid, 1993; Beyer, 1990; Bradley, 1989; Gottfredson, 1981, 2005; Liben et al., 2001; Williams et al., 2010) we asked children to estimate the jobs' difficulty (cf. Eccles, 2011; Eccles & Wigfield, 1995). Finally, we aimed to show that by presenting occupations in pair forms children's vocational self-efficacy beliefs can be boosted (Hypothesis 2) and that children's perceptions of job accessibility mediate the influence of the linguistic intervention on vocational self-efficacy beliefs (Hypothesis 3).

Experiment 2

Participants

Participants were children (N = 154) attending classes 3–6 from primary schools in Germany (n = 77) and Belgium (n = 77). German participants' age ranged from 7 to 12 years. Forty-one pupils (20 female and 21 male) were assigned to the control group (i.e., generic masculine forms) and 36 pupils (17 female and 19 male) to the experimental group (i.e., pair forms). Belgian participants' age ranged from 7 to 13 years. Forty pupils (17 female and 23 male) were assigned to the experimental group and 37 pupils (27 female and 10 male) to the control group. Experimental and control group were well matched for age: The mean age of children from the experimental groups was 10 years (SD = 1.1) and the mean age of control group children was 10 years and 2 months (SD = 1.3).

Materials

Job Accessibility (in Terms of Status and Difficulty)

The same lists of eight stereotypically male and five stereotypically female occupational titles as in Experiment 1 were used. Since Experiment 1 confirmed our expectation that the linguistic treatment would not affect perceptions of gender-neutral jobs, those were no longer included. Thus, only stereotypically female occupations served as filler items in Experiment 2, leaving a total of 13 occupations. To measure subjective job accessibility (status and difficulty), compared to Experiment 1 we now used a more comprehensive set of questions adapted from Liben and colleagues (2002): For each of the 13 jobs children were asked four questions:

a) "How important is it to be ___?"
b) "How hard is it to do the job of ____?"
c) "How hard is it to learn the profession of _____?" and
d) "How much money do you think ____ get paid?"

The answering scales ranged from 1 = *not at all*, to 5 = *very much*. To gain a deeper understanding of the dimensionality of subjective job accessibility we ran exploratory factor analysis on the four questions (principal component analysis), extracting factors with an eigenvalue > 1 while using the varimax rotation method. Results of this analysis suggested that the four items should best be reduced to two dimensions. The items relating to "difficulty of doing the job" (factor loading = .89) and "difficulty of learning to do the job" (factor loading = .89) loaded on the first dimension "difficulty," explaining 43% of the variance with an eigenvalue of 2.99 (no loadings higher than .2 on the other dimension). The items "importance of the job" (factor loading = .72) and "money earned" (factor loadings = .92) had substantial loadings on the second dimension "status," explaining 34% of the variance with an eigenvalue of 1.50 (no loadings higher than .2 on the other dimension).

The same factor analysis conducted on traditionally female occupations yielded analogous results: The first factor "difficulty" explained 43% of the variance with an eigenvalue of 1.98 (difficulty to do the job: factor loading = .91; difficulty of learning to do the job: factor loading = .91; no loadings higher than .2 on the other factor). The second factor "status" explained 37% of the variance with an eigenvalue of 1.25 (importance: factor loading = .82; money: factor loading = .89; no loadings higher than .2 on the other factor).

Finally, we aggregated children's ratings to obtain a status measure (α = .65) and a difficulty measure (α = .78) for traditionally male occupations, and a status measure (α = .67) as well as a difficulty measure (α = .82) for traditionally female occupations.

Vocational Self-Efficacy

Adapted from the study by Chatard et al. (2005), for each occupation, we asked children: "Imagine you wanted to become …, how confident are you that you would pass the qualification test required to do this job when you are grown up?" The answering scale ranged from 1 = *very little*, to 5 = *very much* (male occupations: α = .81, female occupations: α = .64).

Analysis

The same regression analyses as in Experiment 1 were conducted on the current dataset. Results are depicted in Tables 4 and 5. Means and standard deviations for the dependent variables are reported in Table 3.

Table 3. Means and standard deviations (in parentheses) for status perceptions, difficulty perceptions, and vocational self-efficacy toward male and female jobs according to experimental condition in Experiment 2

		Occupation				Occupation	
Condition	Gender	Male status	Male difficulty	Female status	Female difficulty	Male self-efficacy	Female self-efficacy
GM	Boys	4.09 (0.50)	3.88 (0.43)	3.19 (0.60)	2.76 (0.06)	2.99 (0.72)	3.50 (0.75)
	Girls	4.04 (0.47)	4.11 (0.83)	3.31 (0.57)	2.80 (0.54)	2.26 (0.56)	3.57 (0.63)
PF	Boys	3.91 (0.43)	3.60 (0.61)	3.09 (0.59)	2.64 (0.61)	3.23 (0.73)	3.53 (0.72)
	Girls	3.78 (0.51)	3.78 (0.64)	3.36 (0.57)	2.68 (0.45)	2.52 (0.77)	3.62 (0.58)

Notes. GM = generic masculine; PF = pair form. Scale range = 1–5.

Table 4. Predictors of perceived status and perceived difficulty of male and female occupations in Experiment 2

	Occupation															
	Male								Female							
	Status				Difficulty				Status				Difficulty			
	b	*SE* (*b*)	*β*	R^2	*b*	*SE* (*b*)	*β*	R^2	*b*	*SE* (*b*)	*β*	R^2	*b*	*SE* (*b*)	*β*	R^2
Intercept	4.173	.017			3.905	.024			3.231	.029			2.684	.062		
LI	−.064*	.017	−.174		−.153*	.024	−.268		−.045	.025	−.079		−.088	.062	−.159	
Gender	.025	.025	.067		−.068	.091	−.068		−.106*	.033	−.186		−0.73	.067	−.132	
Age	−.017	.015	−.057		.031	.022	.067		−.128*	.023	−.273		−.010	.045	−.023	
L	.031	.017	.084		.082*	.027	.143		.117*	.030	.206		−.188*	.075	−.339	
LI × Gender	.022	.025	.060		−.042	.091	−.073		−.052	.033	−.091		.005	.067	.009	
LI × L	.019	.017	.051		−.007	.027	−.012		−.006	.030	−.011		.022	.075	.040	
LI × Age	.043	.027	.140		.066	.038	.137		.015	.023	.031		−.003	.045	−.005	
				.07*				.16*				.15*				.15*

Notes. Scale range = 1–5. Effect codes: LI = Linguistic intervention (generic masculine = −1, pair form = 1), Gender (girl = −1, boy = 1), L = Language (German = 1, Dutch = −1), Age is grand mean centered. *$p < .05$.

Table 5. Predictors of self-efficacy toward male and female occupations in Experiment 2

	Occupation							
	Male				Female			
	b	*SE* (*b*)	*β*	R^2	*b*	*SE* (*b*)	*β*	R^2
Intercept	2.753	.017			3.563	.054		
LI	.117*	.017	.148		.009	.054	.013	
Gender	.361*	.071	.456		−.028	.049	−.042	
Age	−.019	.028	−.029		−.044	.059	−.082	
L	.022	.033	.022		.184*	.065	.281	
LI × Gender	.007	.071	.007		−.040	.049	−.040	
LI × L	−.021	.033	−.021		−.048	.065	−.073	
LI × Age	.014	.028	.021		.052	.059	.094	
				.246*				.071

Notes. Scale range = 1–5. Effect codes: LI = Linguistic intervention (generic masculine = −1, pair form = 1), Gender (girl = −1, boy = 1), L = Language (Germany = 1, Belgium = −1). Age is grand mean centered. *$p < .05$.

Results

Perceived Accessibility (in Terms of Status and Difficulty) of Stereotypically Male Occupations

Multiple regression revealed a significant main effect of the linguistic intervention on children's perceived status of stereotypically male occupations, $b = -.06$, $\beta = -.17$, $t(147) = -3.73$, $p < .001$: When male occupations were presented in pair forms, children – regardless of their gender, first language, or age – perceived them as lower in status than when the jobs had been presented in masculines as generic. Also, perceived difficulty of stereotypically male occupations was affected by the linguistic intervention,

$b = -.15$, $\beta = -.27$, $t(147) = -6.58$, $p < .001$: When male occupations were presented in pair forms, children – regardless of their gender, first language, or age – perceived them as less difficult than when the jobs had been presented in masculine as generic.

Vocational Self-Efficacy Beliefs Toward Stereotypically Male Occupations

Multiple regression analysis revealed a significant main effect of the linguistic intervention on children's self-efficacy toward stereotypically male occupations, $b = .12$, $\beta = .15$, $t(147) = 4.07$, $p < .001$. When job titles had been presented in pair forms, children – regardless of their gender, first language, or age – felt more confident that they could pass a qualification test required to do this job than when the professions had been presented as generic masculine. Furthermore, the analysis revealed a significant main effect for children's gender, $b = .36$, $\beta = .46$, $t(147) = 4.70$, $p < .001$: Boys generally felt more confident that they could succeed in stereotypically male occupations than girls.

Perceived Accessibility (in Terms of Status and Difficulty) of and Self-Efficacy Beliefs Toward Other Occupations

As expected, neither children's perceptions of job accessibility (status, difficulty) nor their self-efficacy beliefs with regard to stereotypically female occupations were affected by the linguistic intervention (see Tables 4 and 5 for an overview of all results).

Mediation of the Effect of the Linguistic Intervention on Children's Vocational Self-Efficacy Beliefs Toward Stereotypically Male Occupations via Perceptions of Job Status and Job Difficulty

In order to investigate a possible multiple mediation from perceptions of job accessibility (status and difficulty) on vocational self-efficacy, we first analyzed whether the prerequisite conditions for assuming a mediation were met. These conditions were met for job difficulty, but not for job status perceptions: The linguistic intervention was a statistically significant predictor of perceived difficulty of stereotypically male occupations, $b = -.17$, $t(147) = -3.76$, $p < .001$, and of children's self-efficacy beliefs toward them, $b = .15$, $t(147) = 2.52$, $p = .01$. Furthermore, children's perceptions of job difficulty were a statistically significant predictor of their self-efficacy beliefs while controlling for the impact of the linguistic intervention, $b = -.38$, $t(147) = -3.70$, $p < .001$ (cf. Figure 2). While the linguistic intervention also predicted children's perceptions of job status, $b = -.07$, $t(147) = -2.21$, $p = .03$, perceived status was not a significant predictor of children's self-efficacy, $b = .29$, $t(147) = 1.90$, $p = .08$.

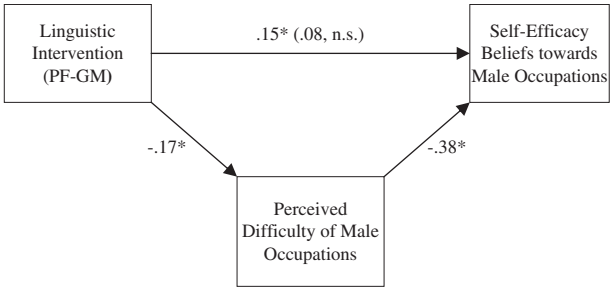

Figure 2. Unstandardized regression coefficients for the relationship between linguistic intervention and vocational self-efficacy beliefs as mediated by perceptions of difficulty of male occupations in Experiment 2. Value ratings for occupational status and vocational self-efficacy beliefs from 1 (= *not at all*) to 5 (= *very much*), effect code: linguistic intervention (generic masculine = −1, pair form = 1). Unstandardized regression coefficients between linguistic intervention and vocational self-efficacy controlling for perceived status in parentheses. *$p < .05$.

We now conducted a mediation analysis only for the variable for which the prerequisite conditions had been met: job difficulty perceptions. We used the bootstrap method with bias-corrected confidence estimates (MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2008). In our sample, the 95% confidence interval for indirect effects was obtained via 5,000 bootstrap resamples (Preacher & Hayes, 2008). Results confirmed perceived job difficulty of male occupations as mediating the relation between the linguistic intervention and children's self-efficacy beliefs, $b = .06$, CI = .02–.13. The impact of the linguistic intervention on children's self-efficacy was nullified completely when controlling for perceived job difficulty, $b = .08$, $t(147) = 1.40$, $p = .17$ (cf. Figure 2).

In summary, results indicate that it was perceptions of job difficulty but not perceptions of job status that mediated the relationship between the linguistic intervention and vocational self-efficacy beliefs: Compared to children to whom the jobs had been described in the generic masculine, children in the linguistic pair form condition perceived stereotypically male occupations as more accessible in terms of lower difficulty to learn and to do the job, with the strengthened subjective accessibility in turn reinforcing children's self-efficacy beliefs in their ability to meet the requirements of these jobs.

Discussion

Experiment 2 deepened our understanding of the impact of pair forms (compared to generic masculines) on children's perceptions of job accessibility (status and difficulty), vocational self-efficacy beliefs, and how these constructs are

related to each other. Going beyond Experiment 1, subjective job accessibility was measured via several indicators of status (earnings, importance) and via difficulty (job difficulty, job training difficulty). Results showed that while the linguistic intervention impacted both, status and difficulty perceptions, the boost in children's self-efficacy beliefs toward traditionally male occupations described to them in pair forms was brought about by an attenuation of ascribed difficulty only.

General Discussion

Combining previous research on the influence of gendered language on social perception (e.g., Boroditsky Schmidt, & Philips, 2003; Gygax & Gabriel, 2011) with work on gender stereotypes (e.g., Diekman & Eagly, 2000), occupational stereotypes (Gottfredson, 1981, 2005), gendered perceptions of difficulty (Eccles & Wigfield, 1995), and vocational self-efficacy (e.g., Bandura et al., 2001; Chatard et al., 2005), in our studies we experimentally investigated whether presenting job descriptions in pair forms or in generic masculines differentially affected children's perceptions of job accessibility and vocational self-efficacy beliefs toward stereotypically male jobs. We had expected that the linguistic intervention would impact vocational self-efficacy beliefs by the assignment of higher accessibility to professions which, via the pair form presentation, were more strongly associated with female jobholders. In addition, we wanted to test whether the effects of the linguistic intervention would be observed across groups of children from different linguistic backgrounds: Dutch versus German.

As predicted, both boys and girls indicated higher levels of self-efficacy beliefs toward stereotypically male occupations when the jobs had been described to them in pair forms rather than in generic masculine forms in our second study. This finding replicates the results which Chatard and his colleagues (2005) had found in an older sample of 15-year-olds who reported higher vocational self-efficacy beliefs toward occupations which had been presented in pair forms (rather than in generic masculine forms). Our study results are the first to show that pair form use can boost vocational self-efficacy already in primary school children aged 7–12.

Going beyond the study by Chatard and his colleagues (2005), in our experiments we also investigated the psychological mechanisms underlying the effect of the linguistic intervention. We had expected that by linguistically strengthening the mental association between traditionally male jobs and female jobholders the subjective accessibility of the jobs would be increased: Children should consider them as not out of reach and difficult as gender stereotypes suggest.

In our first experiment, using assumed earnings as the only indicator of job accessibility (i.e., status), solely boys' perceptions were impacted by the linguistic intervention. As previous research has found occupational income to be of less importance to girls (Teig & Susskind, 2008; Weisgram et al., 2010), in our second study we used a broader set of indicators of job accessibility. Also, we differentiated between job status (earnings, importance) on the one hand and job difficulty (to do and to learn the job) on the other. When importance was introduced as an additional indicator in our second study, an impact of the linguistic intervention on both boys' and girls' job status perceptions could be substantiated. Also, it could be shown that the use of pair forms significantly attenuated girls' and boys' perceptions of difficulty to do and to learn a traditionally male occupation. While our second study thus yielded a clearer pattern of results than our first study, we still consider the findings of the first experiment to be valuable. Taken together, the two experiments provide a replication of the effectiveness of our treatment: Generic masculine forms versus pair forms do have a differential effect on children's perceptions of the accessibility of stereotypically male occupations – with assumed earnings being insufficient a dependent variable to fully detect this effect.

To conclude, while past studies have shown that stating both genders explicitly, instead of using a generically masculine form, facilitates mental associations with women in adults (Stahlberg et al., 2007) and in children (Vervecken et al., 2013), our present research is the first to show that this "linguistic feminization" of stereotypically male occupations also leads to the ascription of higher job accessibility by primary school children aged 6–12. This result complements more general findings on gendered occupational stereotypes which demonstrate that both children and adults tend to attribute higher levels of status and difficulty to professions in which male jobholders outweigh female ones (e.g., Alksnis et al., 2008; Eccles, 2011; Furnham & Wilson, 2011; Liben et al., 2001; Teig & Susskind, 2008; West et al., 2012; Williams et al., 2010).

Going beyond previous research, in our second study we also identified the psychological mechanism linking subjective job accessibility to self-efficacy: The influence of the linguistic intervention on children's beliefs of being able to meet the requirements of traditionally male jobs was mediated through perceptions of job and training difficulty, but not via the ascription of status: Traditionally male jobs (but, as expected, not traditionally female ones) were regarded as less difficult once they were associated with female jobholders via the pair form description. Boys and girls at that age have already acquired gender stereotypes according to which tasks with a male connotation are "difficult ones" while tasks with a female connotation are "easy ones" (e.g., Alksnis et al., 2008; West et al., 2012; Williams et al., 2010). As a result, they ascribe lower difficulty to male occupations presented with an explicit reference to female jobholders and, as a result, experience a stronger sense of self-efficacy toward these jobs. With expectations of success (being inversely related to difficulty perceptions) and self-efficacy being important predictors of occupational preferences (e.g., Bandura et al., 2001; Eccles, 2011; Gottfredson, 1981, 2005), our findings thus also contribute to an explanation for why young people are typically not interested in advancing into domains that have a strong male, high difficulty connotation, such as the

STEM-professions (Eccles, 2011; Eccles et al., 1983; Hannover & Kessels, 2004; Kessels et al., 2006).

Future Directions

Our results have implications for making stereotypically male occupations more attractive. By combining our findings regarding the impact of linguistic forms on children's perceptions of job accessibility with those on their vocational self-efficacy beliefs, we gained an in-depth understanding of the underlying mechanism by which the boost in children's self-efficacy beliefs toward traditionally male occupations was brought about: It was mediated by the ascription of lower job and training difficulty. As high difficulty is no inherent characteristic of traditionally male jobs but reflects the impact of gender stereotypes and occupational stereotypes, it seems that educators describing stereotypically male occupations to students in pair forms and refraining from using generic masculine forms may boost their students' self-efficacy beliefs toward these occupations. Girls in particular might benefit from this self-efficacy boost since they tend to report lower levels of expectations of success and of self-efficacy toward traditionally male academic and professional domains (e.g., Eccles, 2007; Sainz & Eccles, 2012). Girls also tend to feel more restricted than boys in the number of occupations which they perceive to be "within reach" and "appropriate" for them (e.g., Dorr & Lesser, 1980; Looft 1971; McMahon & Patton, 1997). By presenting stereotypically male occupations in a pair form, teachers might encourage girls to consider more academic and professional options instead of narrowing their options down from a very early age.

Some researchers advocate the use of gender neutralizing word forms (undifferentiated feminine or masculine nouns; e.g., Geschäftsleute, business people) rather than pair forms (Duden, 2006; Hellinger & Bierbach, 1993) since pair forms might increase the salience of gender as a relevant category. As a consequence, their repeated use could actually enhance – rather than attenuate – stereotyping and prejudices. However, it has been repeatedly shown that these epicene forms trigger the same male bias as generic masculines (e.g., Heise, 2000; Irmen & Roßberg, 2004). For instance suffixes such as "fighter" or "officer" (as in firefighter or police officer) can hardly be called gender neutral, as fighter and officer are likely to trigger associations with masculinity. Hence, if one's purpose is to counteract preexisting gender stereotypes, it might be far better to highlight counter stereotypic instances through gender-explicit pair forms rather than gender-neutral language (Liben & Signorella, 1993, p. 148). Also, the findings from our studies are inconsistent with the view that pair form use activated gender stereotyping: If our intervention (pair forms) had increased the salience of gender, girls would have reported lower self-efficacy beliefs toward male occupations. In fact, girls in our pair form condition described their self-efficacy beliefs as stronger compared to the girls in the generic masculine condition, suggesting that our intervention triggered more gender balanced mental representations and thus reduced gender stereotyping.

Our results showed that linguistic forms impacted children's perceptions of job accessibility and self-efficacy beliefs irrespective of their first language being German or Dutch. For some variables we observed differences between the children from our two language groups which seemed to reflect variations that were not in the main focus of our study: For instance, variations in absolute income levels between the two countries mirrored in the children's different earning estimates. However, the impact of the linguistic intervention was the same for Dutch- and German-Speaking children. Our set of experiments is the first in demonstrating effects of a linguistic intervention in two languages which differ in the extent to which speakers are grammatically forced to make gender references when alluding to subjects or nouns (with German being a stronger grammatical gender language than Dutch). This is especially interesting since it has been suggested that the stronger a language's grammatical gender, the more its speakers rely on grammatical gender cues for making social inferences (Gygax, Gabriel, Sarrasin, Garnham, & Oakhill, 2008) and the more likely they are to express sexist attitudes (Wasserman & Weseley, 2009). Results from our two experiments suggest that children from a strong grammatical gender language (i.e., German) and a moderate grammatical gender language (i.e., Dutch) were equally affected by the linguistic intervention: They both ascribed higher accessibility to and reported higher levels of self-efficacy toward stereotypically male occupations when they were presented to them in pair forms, rather than in generic masculine forms. It seems, in languages which employ grammatical gender and thus have the linguistic devices to explicitly refer to both genders, children's gender-related associations and beliefs about vocations can be influenced through linguistic forms used to present occupational titles.

Limitations of Our Studies

The notion advanced in this article was that gender fair language use influences children's self-efficacy beliefs and perceptions of accessibility regarding traditionally male occupations. Although the results of this study provide valuable insights into effects of language use on vocational development, some limitations must be acknowledged when interpreting the results.

First, due to the arrangements with the participating schools, we had to maintain existing class constellations during the experiments which rendered the cross-class assignment of children to control or experimental conditions impossible. It cannot be ruled out that although in the experiments described in Study 1 and Study 2 school classes were randomly assigned to control or experimental group, that, for instance, by pure luck some experimental classes already had more gender balanced perceptions about occupations from the start. Although we sampled

several classes to reduce the likelihood of preexisting differences between the experimental and control groups and applied a statistical procedure (i.e., standard error correction and multilevel analysis) to deal with the clustering of the pupils, other procedures should be tested in the future to replicate the present findings: A fully randomized assignment of all children across classes to experimental or control condition would be ideal. Another alternative is to collect data to detect preexisting differences between classes that might bias the outcome of the experiment (e.g., children's gender-role beliefs). This would also allow for testing for moderators.

Second, because of time constraints, no potential moderators (besides biological sex and age of participants) were measured. It is however conceivable that the impact of gender fair language may be different for children with egalitarian rather than traditional gender-role beliefs. For instance in the research by Liben et al. (2002), it was especially the children with traditionally gender-role beliefs that perceived occupations in a stereotyped manner. Future studies might want to further address this question.

And third, whereas the results of the present set of cross-sectional experiments illustrate effects of gender fair language shortly after it is presented, it is difficult to make inferences about long-term effects. A recent review study by Abad and Pruden (2013) suggests that gendered materials – for instance, the gender fairness or unfairness of language in school books (Moser & Hannover, 2014) influence the development of gender stereotypes in children. However, to our knowledge no studies ever tested the influence of repeated exposure to gender fair versus traditional language. A full account of the impact of gender fair language on children's development of occupational gender stereotypes and their subsequent educational and vocational development could only be provided by longitudinal study designs. For instance, some teachers could be trained in using gender fair language, while the development of their pupils' gender-role beliefs and occupational aspirations could be monitored over a longer time period and compared to pupils of teachers who use traditional language. In a similar design, textbooks using either gender fair or traditional language could be randomly assigned to different school classes. Again, the development of children's gender-role beliefs and their occupational aspirations could be monitored and compared between experimental and control group.

Fourth, according to the circumscription and compromise theory (Gottfredson, 1981, 2002), children exclude jobs which they perceive as out of reach in terms of prestige/status, ability, and efforts required as possible career choice. Although our research demonstrates that the language used to present traditionally male occupations influences crucial factors of vocational development: Perceived job accessibility and self-efficacy beliefs, other factors (such as socioeconomic background, interest, intelligence) must not be disregarded when trying to understand occupational choices. Also, future studies should not only look at occupational self-efficacy beliefs but include measures of occupational interests and behavioral intentions to pursue different careers.

Conclusion

The results from our two experiments support the general notion that gender in language influences people's gendered perceptions (e.g., Boroditsky, 2009; Deutscher, 2010). Our results complement previous findings according to which the use of pair forms (compared to generic masculines) strengthens the mental inclusion of women. Our studies add to this line of research by showing that the "feminization" of stereotypically male occupations coincides with perceptions of higher accessibility of these jobs, while at the same time promoting children's vocational self-efficacy beliefs toward them. Compared to other interventions such as modeling successful workers in gender atypical occupations (e.g., Bailey & Nihlen, 1990; Miller, 1986) and explicit career education (Barclay, 1974), the use of pair forms is something which can be done on a daily basis by, for instance, primary school teachers. Future research may want to investigate whether other interventions to inform children that also women can do traditionally male jobs (e.g., pictorially by showing images of both female and male jobholders, or verbally by explicitly stating that women can do the job too) have a similar effect on children's perceptions of job accessibility and self-efficacy beliefs. Because of this ease and the large scale with which our linguistic intervention (the use of pair forms to present traditionally male occupations) could be implemented in the educational landscape, our current findings seem especially promising in promoting children's confidence in their academic and professional abilities regarding stereotypically male domains. This is especially so because our set of experiments suggests that these effects occur regardless of primary school children's gender, age, or language background.

Given that most languages employ grammatical gender, and have the linguistic devices to explicitly state both genders of jobholders (see Prewitt-Freilino et al., 2012), a language reform in the respective countries could contribute to reducing the skill shortage in traditionally male occupations in the long term, as it empowers young children to believe: "YES I CAN!" We find this line of research extremely exciting and hope that future research will further advance our understanding of the impact of gender fair language on vocational development.

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Dries Vervecken

Karel de Grote University College
Brusselstraat 45
2018 Antwerpen
Belgium
E-mail Dries.vervecken@kdg.be

Appendix

Occupational titles (pair forms in parenthesis) used in Experiments 1 and 2

	German	Dutch	English translation
Stereotypically male:	Astronauten (und Astronautinnen)	Astronauten (en astronautes)	(Male and female) astronauts
	Lastwagenfahrer (und Lastwagenfahrerinnen)	Vrachtwagenchauffeurs (en vrachtwagenchauffeuses)	(Male and female) truck drivers
	Geschäftsmänner (und Geschäftsfrauen)	Zakemannen (en zakenvrouwen)	Businessmen (and businesswomen)
	Erfinder (und Erfinderinnen)	Uitvinders (en uitvindsters)	(Male and female) inventors
	Bürgermeister (und Bürgermeisterinnen)	Burgemeesters (en burgemeesteressen)	(Male and female) mayors
	Maurer (und Maurerinnen)	Metselaars (en metselaarsters)	(Male and female) bricklayers
	Feuerwehrmänner (und Feuerwehrfrauen)	Brandweermannen (en brandweervrouwen)	Firemen (and firewomen)
	Automechaniker (und Automechanikerinnen)	Automonteerders (en automonteersters)	(Male and female) car mechanics
Stereotypically female:	Blumenverkäufer (und Blumenverkäuferinnen)	Bloemenverkopers (en bloemenverkoopsters)	(Male and female) flower sellers
	Babysitter (und Babysitterinnen)	Kinderoppassers en kinderoppasseressen	(Male and female) babysitters
	Zahnartzhelfer (und Zahnartzhelferinnen)	Tandartsassistenten (en tandartsassistentes)	(Male and female) dental assistants
	Raumpfleger (und Raumpflegerinnen)	Schoonmakers (en schoonmaaksters)	(Male and female) cleaners
	Kosmetiker (und Kosmetikerinnen)	Schoonheidsspecialisten (en schoonheidsspecialistes)	(Male and female) beauticians
Stereotypically gender neutral:	Sänger (und Sängerinnen)	Zangers (en zangeressen)	(Male and female) singers
	Sportler (und Sportlerinnen)	Sporters (en sportsters)	(Male and female) athletes
	Schriftsteller (und Schriftstellerinnen)	Schrijvers (en schrijfsters)	(Male and female) writers

