

What Do I Want to Be? Predictors of Communal Occupational Aspirations in Early to Middle
Childhood

Marte Olsen¹, Maria I. T. Olsson², Elizabeth J. Parks-Stamm³, Marie Kvalø¹, Kjærsti
Thorsteinsen¹, Melanie C. Steffens⁴, & Sarah E. Martiny¹

¹UiT The Arctic University of Norway, Norway

²Inland Norway University of Applied Sciences, Norway

³University of Southern Maine, USA

⁴University of Koblenz and Landau, Germany

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Author Note

Marte Olsen, Marie Kvalø, Kjærsti Thorsteinsen, and Sarah E. Martiny, Department of Psychology, Research Group Social Psychology, UiT The Arctic University of Norway, Norway. Maria I. T. Olsson, Inland School of Business and Social Sciences, Inland Norway University of Applied Sciences, Norway. Elizabeth J. Parks-Stamm, Department of Psychology, University of Southern Maine, USA. Melanie C. Steffens, Department of Social, Environmental, and Economic Psychology, University of Koblenz and Landau, Germany.

Correspondence concerning this article should be addressed to Marte Olsen, Department of Psychology, Research Group Social Psychology, UiT The Arctic University of Norway, Department of Psychology, PO Box 6050 Langnes, 9037 Tromsø, Norway, email: mol128@post.uit.no

Abstract

Research investigating occupational aspirations in childhood is scarce. In addition, most research on occupational aspirations has focused on increasing the number of women in agentic, high-paying jobs. Therefore, we investigate factors associated with communal occupational aspirations in two studies with young children (Study 1: 159 children, $M_{\text{age}} = 5.51$ years; Study 2: 96 children; $M_{\text{age}} = 9.44$ years). We found that girls aspired more towards communal occupations than boys did among the older, but not the younger, children. When combining the two samples, we found that the more gender stereotypes girls reported, the more they aspired towards communal occupations. In addition, communal self-perceptions mediated the relationship between child gender and occupational aspirations. Lastly, the perceived status of the communal occupations was positively associated with children's aspirations among older children. Implications for theoretical models of the development of occupational aspirations and early interventions to reduce occupational gender segregation are discussed.

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https://osf.io/5cr3u/?view_only=1f03932d91a0436dbdeb0c7144247d7d

What do I Want to Be? Predictors of Communal Occupational Aspirations in Early to Middle Childhood

Researchers agree that the development of occupational aspirations is a life-long process from infancy through childhood, adolescence, and adulthood (e.g., Gottfredson, 1981; Hartung et al., 2005). Despite this, existing research on the predictors of occupational aspirations have often focused on adolescents and young adults rather than children (see Hartung et al., 2005). This is problematic as many psychological factors that lead individuals to rule out certain roles or fields as unsuitable (e.g., stereotypes) develop in early childhood (see Gottfredson, 1981). Because this exclusion of certain fields may influence occupational choices later in life, it is important to understand the predictors of occupational aspirations in early and middle childhood.

In addition, previous work on occupational aspirations has mostly focused on predictors of high-status agentic occupational aspirations (e.g., leadership roles) with the goal of increasing the number of women in male-dominated fields (Croft et al., 2015). This has been partly successful. For example, research from the US shows an increase in women entering agentic fields between 1995 and 2013 (Bureau of Labor Statistics as cited in Croft et al., 2015). Interestingly, however, hardly any change has been observed in the number of men entering communal occupations (e.g., caring roles like nursing or teaching). Increasing the number of men in communal roles, including communal occupations and housework, is important because research shows that being communally oriented has personal and societal benefits (e.g., Bauer & McAdams, 2010; Le et al., 2012). In addition, men's participation in the home is essential for women to be able to pursue agentic, high-status occupations (Croft et al., 2019). Thus, to address occupational segregation based on gender it is important to understand not only factors that predict agentic occupational aspirations, but also communal occupational aspirations. Therefore,

based on key theories of gender role development, the present study investigates factors that are associated with young children's communal occupational aspirations.

The Development of Occupational Aspirations in Childhood

In 1981, Gottfredson introduced a developmental theory of occupational aspirations, which states that children's self-concept (i.e., their view of themselves) and occupational gender stereotypes (i.e., generalized beliefs about which roles women and men should have) are the main factors that influence their occupational preferences. These factors are more or less impactful at different stages of development. Other more recent theoretical approaches explain why we see gender differences in occupational aspirations starting at a young age. Gender schema theory, for instance, states that children are motivated to behave in accordance with their gender schemas (i.e. cognitive network of information about gender), as they seek cognitive consistency between their beliefs about gender and their own gender-related behavior. Accordingly, if a boy perceives that only women are nurses, he will not aspire to be a nurse. Furthermore, another prominent recent theory, role congruity theory, proposes that individuals who act in accordance with the norms associated with their social group will be evaluated positively, and those who do not will face negative evaluations (Eagly & Karau, 2002). This means that a girl who aspires towards a communal occupation (such as nursing) may receive positive feedback, whereas a boy who aspires towards a communal occupation may be evaluated negatively. Both gender schema theory and role congruity theory thus predict that children will be motivated to behave in accordance with gender norms. Both of these theories have guided empirical research on the predictors of children's occupational aspirations (e.g., Block et al., 2018; Weisgram et al., 2010). However, little research has investigated whether these aspirations develop in line with the developmental stages proposed in the theory by Gottfredson (1981) or

whether they develop earlier in childhood, as most research on occupational aspirations has been conducted on adolescents and young adults. Therefore, the focus of our research is to investigate how children's gender stereotypes and (gendered) self-perceptions influence communal occupational aspirations in early to middle childhood. In addition, we will investigate whether perceptions of status are also associated with children's communal occupational aspirations as proposed by Gottfredson (1981).

The Impact of Gender and Gender Stereotypes on Children's Occupational Aspirations

According to Gottfredson (1981), children begin to base their occupational preferences on the occupations they view as suitable for their gender at around 6-8 years old, which is mostly determined by gender stereotypes. Gender stereotypes also play a crucial role in gender schema theory (Martin et al., 2002), however, this theory proposes that children's understanding of their own and others' gender is developed at an earlier age, as children begin to develop gender schemas as soon as they are able to observe differences between genders. According to this view, the content of children's gender schemas (e.g., whether they are stereotypical or not) will determine whether children's occupational aspirations are gender-typed or not.

Evidence for gender-typed preferences and behavior in early childhood has been found in many empirical studies. For example, children have been shown to prefer gender-congruent toys by age two (Serbin et al., 2001), like attractive toys less when they are labeled as being toys for the other gender (Martin et al., 1995), and prefer more gender-typed toys even when they were advertised with a counter-stereotypical message (Spinner et al., 2018). A longitudinal study also found that children's gender-typed play behavior increased as their gender labelling skills developed (Fagot & Leinbach, 1989).

Concerning occupational aspirations, some research shows that by age 4, boys are more likely to aspire to agentic occupations, whereas girls are more likely to aspire to communal occupations (Levy et al., 2000; Trice & Rush, 1995; Weisgram et al., 2010), which further calls into question Gottfredson's (1981) idea that gender does not affect occupational aspirations until later in childhood. A study conducted in Canada (Serbin et al., 1993) found that, among children between 5-12 years old, boys preferred masculine activities more than girls, and that girls preferred feminine activities more than boys. Taken together, research indicates that children's gender stereotypes may begin to impact their behavior and their occupational aspirations in early to middle childhood. However, because of the limited number of empirical studies investigating children's communal occupational aspirations (see McMahon & Watson, 2008), more research on this is needed.

The Impact of Communal Self-Perceptions on Children's Occupational Aspirations

Importantly, when considering the roles of gender stereotypes on occupational aspirations, self-perceptions in line with such stereotypes should be taken into account. According to Gottfredson (1981), internal factors, such as values, goals, and self-perceptions (e.g., viewing oneself in line with agentic or communal traits and behaviors) begin to influence adolescents' occupational aspirations at about 14 years of age. In line with this claim and role congruity theory (Eagly & Karau, 2002), gender differences were found in communal and agentic self-perceptions in adulthood, with women holding more communal self-perceptions and men holding more agentic self-perceptions (Costa et al., 2001). Research has also found that, among adults, more communal values and goals predict higher communal occupational aspirations (Diekman et al., 2010; Weisgram et al., 2010). However, recent evidence also suggests that values and goals already matter for young children's aspirations: boys report less

communal values and goals than girls, and girls report less agentic values and goals than boys (Block et al., 2018; Ojanen et al., 2005). In addition, a study found that both agentic and communal values mediated the relationship between gender and family orientation, where those with higher agentic values reported a lower family orientation and those with higher communal values reported higher family orientation. Taken together, gender differences in communal self-perceptions are visible in early to middle childhood and such self-perceptions seem to influence occupational aspirations earlier than previously thought. We therefore aim to extend the earlier findings by investigating whether communal self-perceptions mediate the relationship between gender and occupational aspirations in young children.

The Impact of Perceived Occupational Status on Children's Occupational Aspirations

In addition to the influence of gender stereotypes and gendered self-views, Gottfredson (1981) proposed that by the age of 9-13 years the child's social class, the perceived status of the occupation, and the child's perception of their ability to pursue the occupation emerge as important factors in shaping their occupational aspirations. However, research shows that the perceived status of occupations might also influence children's occupational aspirations at an earlier age, as young children (ages 5-10) who aspired toward powerful jobs (i.e., jobs involving making important decisions and earning more money) were shown to aspire more toward agentic occupations and less toward communal occupations (Weisgram et al., 2010). Similarly, 11-year-old children believed that novel jobs portrayed with male workers had a higher status than the same jobs portrayed with female workers, as the children thought the jobs portrayed with male workers were higher paid, more difficult, and more important (Liben et al., 2001). This illustrates that children in this age group have some understanding of status and power differences and that some children value high status when imagining their future occupations.

One important aspect of an occupation's status is the salary that a person working in these occupations receives. Indeed, children between 3 and 7 years old believed that men generally earn more money than women, especially in agentic occupations (Levy et al., 2000). Although Weisgram et al. (2010) did not find an effect of salary on the occupational aspirations of children or adolescents, Hardie (2015) found that the lower perceived median income in communal occupations predicted adolescent boys' lower communal occupational aspirations. Also examining this question of salary, two experimental studies presented children between the ages of 6 and 11 years with novel occupations that were described as high in one of four values, where money was one of the values (Hayes et al., 2018). In the first experiment, boys showed greater interest than girls in occupations that were described as having a high salary, but the findings were not replicated in the second experiment. Taken together, the research is inconclusive, with some studies showing that young children consider power and status in their occupational aspirations (Liben et al., 2001; Weisgram et al., 2010), but others not corroborating an effect of perceived salary (Weisgram et al., 2010). Therefore, we extended existing research and explored the role perceived salary plays in the occupational aspirations of children.

The Present Research

The present study was conducted in Norway. Although Norway is one of the most gender egalitarian countries in the world (World Economic Forum, 2020), there is still a significant gender gap in the Norwegian workforce (Utdanning, 2014). Thus, further research on the factors that influence communal occupational aspirations in children is needed, even in highly gender egalitarian societies.

In the present work, we investigate factors that shape children's communal occupational aspirations in early to middle childhood by conducting two studies: one among preschool

children in childcare centers, and one among elementary school children. We not only investigate the role of children's gender and gender stereotypes, but we extend earlier research by also testing whether the perceived status of the occupation and the children's communal self-perceptions relate to their occupational aspirations. We operationalize perceived status of an occupation as the salary the children believe a person working in this occupation receives.

We formulated the following hypotheses. First, girls will aspire more toward communal occupations than boys (H1). In addition, children's endorsement of gender stereotypes related to communal occupations will interact with their gender (H2), that is, girls will aspire more towards communal roles the more strongly they endorse gender stereotypes whereas boys will aspire less towards communal roles the more they endorse gender stereotypes. Communal self-perceptions (H3) and perceived salary for communal occupations (H4) will be positively related to communal occupational aspirations. Finally, the relationship between children's gender and their communal occupational aspirations will be mediated by their communal self-perceptions (H5).

H1, H2, H3, and H5 were pre-registered on the Open Science Framework

(https://osf.io/cq3zf/?view_only=5cc42135af034628a932665247f59f2a;

https://osf.io/g2j8a/?view_only=1cb13e9d03b743dead99d2ad9e5868fc) and tested in both

studies. H4 was a non-preregistered exploratory hypothesis and only tested in Study 2 (see

Supplemental Materials for additional preregistered analyses)¹. In the following, we will first

present the data of the two studies when being analyzed separately and then we will report

combined analyses to increase statistical power and test the robustness of the observed effects.

Study 1 – Childcare Centers

The first study was conducted in childcare centers to investigate how gender, gender stereotypes, and self-perceptions influence the occupational aspirations of children in early childhood.

Method

Transparency and Openness

The project was registered at the Norwegian Center for Research Data (<https://www.nsd.no/en>) which approved the planned data collection. In addition, we received approval from the internal board for research ethics at the first author's institution. All data and syntax of analyses is available at OSF (https://osf.io/5cr3u/?view_only=1f03932d91a0436dbdeb0c7144247d7d). All four hypotheses that we preregistered were formulated directionally. Therefore, when testing these hypotheses, we set the criterion for significance to a value of $p = .10$ (for a one-tailed test).

Participants and Procedure

Participants were recruited by contacting the administrators of childcare centers in the local region, asking for permission to conduct our study in their childcare center. We then distributed consent forms to the parents in the participating childcare centers. In total, we collected data from 177 children from 20 different childcare centers in northern Norway in 2018. Eleven participants were excluded from the analyses due to revoking consent during testing ($n = 7$), technical issues ($n = 3$), or not following instructions ($n = 1$). We also excluded all children younger than 4.5 years old ($n = 7$). Our final sample consisted of 159 participants (84 boys, 75 girls) between the ages of 54 and 75 months ($M = 66.10$ months, $SD = 4.45$, missing age for two boys). A sensitivity analysis for a linear regression with four predictors (gender, gender

stereotypes [GST], self-perceptions, interaction between GST and gender) conducted for a sample of 159 indicated that a medium effect of $f^2 = .12$ at a power of .95 can be detected.

Participants were tested in groups of up to four by two experimenters, one taking the role of the interviewer (i.e., reading the instructions aloud to participants) and one the role of the secretary (i.e., taking notes and assisting participants if needed). For each testing, one female and one male experimenter was present. The interviewer asked the questions to the children, and the children answered using tablets. A detailed description of the procedure can be found in the Supplemental Materials.

Measures

All of the materials can be found in the Supplemental Material in both English and Norwegian. Children's responses were recorded using two different kinds of scales. A 3-point smiley Likert scale was used to measure the extent to which children aspired toward a set of communal occupations and their preferences toward communal behaviors².

Communal Occupational Aspirations. Children's communal occupational aspirations were measured by showing the children a picture relating to an occupation whilst telling them about the occupation, then asking the children how much they aspire towards the occupation. The questions were phrased: "Would you like to be a [communal occupation] when you grow up?". The children answered on a 3-point Likert scale (1 = *not at all*, 2 = *some*, 3 = *very much*). The same scale was used as for communal self-perception. Children were asked to report aspirations toward three different communal occupations (i.e., nurse, childcare center teacher, stay-at-home parent; $\alpha = .62$).

Communal Self-Perceptions. To measure the extent to which children perceive themselves as communal the experimenter told children that "I will now read short stories about

some children I know. It is your job to tell me whether this child sounds like you.” Four items assessed the extent to which participants identified with communal behaviors (i.e., help others who are upset, be close to others, hug others, comfort others who are upset; $\alpha = .71$). The children answered on a 3-point Likert scale (1 = *not at all*, 2 = *some*, 3 = *very much*). The scale was illustrated with three different emoticons, from a sad face for the first point to a very happy face for the third point (see Supplemental Material).

Children’s Gender Stereotypes. The children were then asked to report gender stereotypes for the same three communal roles (i.e. nurse, childcare center teacher, stay-at-home parent). Children were instructed by the experimenter to “tell me who you think can do this job.” For example: “Who do you think can be a nurse?” Following the procedure for computing a variable for gender stereotyping of communal roles by Spinner et al. (2018), the responses only boys or both boys and girls were coded as 0, since these answers do not represent traditional gender stereotypes for communal occupations. Responding only girls was coded as 1 as it represents traditional female gender stereotypes. A summed total score was calculated for each participant (range 0 to 3), with higher numbers indicating more gender stereotyping.

Results

The descriptive statistics of all measures and the bivariate correlations between them can be found in Table 1.

Factors Associated with Children’s Communal Occupational Aspirations

To test which factors influence communal occupational aspirations (H1-3), we conducted a multiple regression analysis with age (covariate), gender, communal occupational gender stereotypes, the interaction between communal occupational gender stereotypes and gender, and communal self-perceptions as independent variables. All interactions of age and gender with the

independent variables were also tested but were found to be non-significant and were therefore not included in the model presented below, with the exception of the preregistered interaction between communal occupational gender stereotypes and gender. All analyses including all covariates and interactions can be found in the Supplemental Material³.

The results of the regression analysis can be found in Table 2. The effect of gender on communal aspirations was not significant, which indicates that girls did not aspire more toward communal roles than boys did (contrary to H1). The interaction between gender and occupational gender stereotypes regarding communal occupations on the children's communal occupational aspirations was not significant, not supporting H2. However, we found the predicted significant relationship between communal self-perceptions and communal occupational aspirations, $B = .29$, $t(150) = 3.31$, $p = .001$, 95% CI [0.12; 0.47], indicating that the more children see themselves as communal, the more they aspire toward communal occupations, in line with H3.

Do Communal Self-Perceptions Mediate the Relationship between Gender and Communal Occupational Aspirations in Children?

To assess the extent to which gender influences aspirations via communal self-perceptions in children (H5), we conducted a mediation analysis using Hayes' Process macro (2017; Version 3.4.1, Model 4, 10,000 bootstrap samples). Gender was entered as the predictor (X), communal aspirations as the outcome (Y), and communal self-perceptions as the mediator (M). Age was included in the analysis as a covariate. Gender predicted communal self-perceptions, $B = .27$, $p = .005$, 95% CI [0.08; 0.46], which in turn predicted communal aspirations, $B = .29$, $p = .001$, 95% CI [0.12; 0.47]. A bias-corrected bootstrap confidence interval for the indirect effect was above zero, $B = .08$, 95% CI [0.02; 0.17]. Gender did not predict communal aspirations independent of the mediator ($B = .07$, $p = .525$, 95% CI [-0.14;

0.28]). This indicates that girls reported higher levels of communal self-perceptions than boys, which in turn was associated with higher communal aspirations. This finding is in line with H5 and suggests that children's communal aspirations are internally regulated via their communal self-perceptions. Thus, girls may ultimately be more likely to aspire toward communal roles because they are more likely than boys to identify as communal.

Study 2 – Elementary Schools

The aim of the second study was to test if we would replicate the findings of Study 1 in a sample with older children (in elementary schools). As researchers agree that occupational aspirations develop throughout childhood (Gottfredson, 1981; Hartung et al., 2005), we investigated if the predictors of occupational aspirations would influence older children differently than younger children. In addition, we extended Study 1 by exploring another predictor of occupational aspirations in middle childhood from Gottfredson's theory, namely occupational status. We operationalize the perceived status of an occupation as the salary the children believe a person working in this occupation receives.

Method

Transparency and Openness

The project was registered at the Norwegian Center for Research Data, which approved of the planned data collection. In addition, we received approval from the internal board for research ethics at the first author's institution. All data and syntax of analyses is available at https://osf.io/5cr3u/?view_only=1f03932d91a0436dbdeb0c7144247d7d. As outlined earlier, all four preregistered hypotheses were directional. Therefore, when testing these hypotheses, we set the criterion for significance to a value of $p = .10$.

Participants and Procedure

This study was conducted in June 2020. Elementary school children were recruited by contacting the principals at elementary schools all over Norway and asking them to forward information about the study and the link to the online survey to the parents of the children at their school. Parents received the link to the children's survey after completing a survey of their own. The children also were asked their consent to participate at the beginning of the survey. Data were collected from 98 children using an online questionnaire between June 8th and June 29th.

Two children were excluded from analysis as they stated that they did not understand the questions in the questionnaire. Our final sample consisted of 96 children (48 boys, 48 girls) between the ages of 6 and 13 years ($M = 9.44$, $SD = 1.91$, age missing for 6 children). A sensitivity analysis for a linear regression with five predictors (gender, GST, self-perceptions, status, GST x gender) given $N = 96$ indicated that a moderate effect size of $f^2 = .22$ at a power of .95 could be detected.

Measures

The study was conducted using a child-friendly online questionnaire in Norwegian (bokmål). Parents were instructed to help their children with the questionnaire without influencing their responses. In order to enable young children and children who had difficulties reading to participate, all instructions, items, and scale ranges were audiotaped. In addition, most of the scale ranges were illustrated with images (e.g., smileys, thumbs up). The items and illustrations can be found in the Supplemental Material in English and Norwegian in the order in which they were assessed. The audio files (in Norwegian) are available on OSF:

https://osf.io/4frk2/?view_only=b59c6a912a7b488b8b822228c494d52f.

Communal Occupational Aspirations. Children's communal occupational aspirations were measured by asking the children how much they aspire toward three communal occupations

(based on Study 1; nurse, childcare center teacher, stay-at-home parent). The questions were phrased: “How much do you want to be a [communal occupation]?” Then the children answered on a 5-point Likert scale (1 = *not at all*, 2 = *a little*, 3 = *some*, 4 = *quite much*, 5 = *very much*). The scale was illustrated with five different emoticons, from a sad face for the first point to a very happy face for the fifth point (see Supplemental Material). Because the scale did not have satisfactory reliability ($\alpha = .53$), the item with the lowest correlations was excluded (stay-at-home parent). The other two occupations correlated strongly, $r(95) = .50, p < .001$, and therefore were combined to form a scale⁴.

Children’s Gender Stereotypes. The children’s gender stereotypes about communal occupations were measured by asking the children who they believed could work in the three communal occupations. The children answered on a 5-point Likert scale (1 = *only men*, 2 = *mostly men*, 3 = *both men and women*, 4 = *mostly women*, 5 = *only women*). The scale was illustrated with a group of people with corresponding proportions of men or women. The occupations included were the same as in the communal occupational aspirations scale (nurse, childcare center teacher, stay-at-home parent). As the scale again did not have satisfactory reliability ($\alpha = .52$), the item with the lowest correlations (stay-at-home-parent) was removed. The two remaining items correlated strongly, $r(95) = .54, p < .001$.

Perceived Salary. Children’s beliefs about the salary associated with the three communal occupations were also assessed. The children were asked how much money they believe people working in each of the three communal occupations (nurse, childcare center teacher, stay-at-home parent) make. They answered on a 5-point Likert scale (1 = *very little*, 2 = *little*, 3 = *some*, 4 = *much*, 5 = *very much*). The scale was illustrated with money piles of increasing size. As

reliability was again low ($\alpha = .53$), stay-at-home parent was removed from the scale; the other two items were strongly correlated, $r(95) = .52, p < .001$

Communal Self-Perceptions. Communal self-perceptions was measured by asking the children how much they liked to engage in three communal behaviors (similar to Study 1; Do you like to help other children when they are in pain?, Do you like to be with other children?, Do you like to comfort others children when they are sad?). The children answered on a 5-point Likert scale (1 = *not at all*, 2 = *a little*, 3 = *some*, 4 = *much*, 5 = *very much*). The scale was illustrated with five different emoticons, from a sad face for the first point and a very happy face for the fifth point (see Supplemental Material). The scale showed a good reliability ($\alpha = .83$). In addition, children were asked to fill in demographic information.

Results

The descriptive statistics of all the relevant measures and the correlations between them can be found in Table 3.

Factors Associated with Children's Communal Occupational Aspirations

In order to investigate H1-3, we used the same procedure as in Study 1. The interactions of age and gender with the independent variables – except for gender stereotypes – were tested and were found to be non-significant and were therefore not included in the final model. All analyses including all covariates can be found in the Supplemental Materials.

The results of the regression analysis can be found in Table 4. The analyses showed the predicted main effect of gender on communal occupational aspirations, $B = .44, t(83) = 2.27, p = .026, 95\% \text{ CI } [0.05; 0.82]$. As predicted, girls ($M = 1.99, SD = 1.14$) reported higher communal occupational aspirations than boys ($M = 1.39, SD = 0.63$; H1). The interaction between occupational gender stereotypes and gender on communal occupational aspirations was also

significant, $B = -.91$, $t(83) = -1.69$, $p = .095$, 95% CI [-1.99; 0.16]. Boys showed a descriptive decrease in communal occupational aspirations with increased gender stereotypes, $B = -.45$, $t(41) = -1.63$, $p = .111$, 95% CI [-1.00; 0.11], whereas girls did not show an increase in communal occupational aspirations with increased gender stereotypes, $B = .56$, $t(40) = 1.12$, $p = .268$, 95% CI [-0.45; 1.57]. Finally, the main effect of communal self-perceptions on communal occupational aspirations approached significance, $B = .23$, $t(91) = 1.91$, $p = .059$, 95% CI [-0.01; 0.47], and pointed in the predicted direction, with higher communal self-perceptions predicting greater aspirations toward communal occupations (H3).

Exploratory Analyses. To test the additional hypothesis (H4) about the effect of perceived salary on communal occupational aspirations, we ran the multiple regression analyses again separately and included perceived salary as a predictor. The effect of perceived salary was significant, $B = .35$, $t(82) = 2.23$, $p = .028$, 95% CI [0.04; 0.65]. Specifically, children who believed a person makes a lot of money in communal occupations aspired more towards communal occupations.

Do Communal Self-Perceptions Mediate the Relationship between Gender and Communal Occupational Aspirations in Children?

Finally, to test the mediation model (H5), we used Hayes' Process macro (Model 4; 10,000 bootstrap samples). Gender was included as the predictor (X), communal occupational aspirations as the outcome (Y), and communal self-perceptions as the mediator (M). Age was included in the model as a covariate. Gender predicted communal occupational aspirations independently of communal self-perceptions, $B = .44$, $p = .025$, 95% CI [0.06; 0.83]). However, gender did not significantly predict children's level of communal self-perceptions, $B = .26$, $p = .162$, 95% CI [-0.11; 0.62]). Children's communal self-perceptions did significantly predict their

communal occupational aspirations, and the results pointed in the predicted direction; $B = .19$, $p = .091$, 95% CI [-0.03; 0.42]). A bias-corrected bootstrap confidence interval for the indirect effect included zero, $B = .05$, 95% CI [-0.02; 0.15].

Analyses with the Combined Data

To investigate the predictors of communal occupational aspirations in childhood with more statistical power, we combined the data from Study 1 and Study 2. This resulted in a sample of 246 children between the ages of 4 and 13 years. A sensitivity analysis for a linear regression with four predictors (gender, GST, self-perceptions, GST x gender) given $N = 246$ indicated that a small effect size of $f^2 = .08$ at a power of .95 could be detected. The variables were z-standardized as the variables were measured with a 3-point Likert scale in Study 1 and a 5-point Likert scale in Study 2. Age was included as a covariate in the analyses.

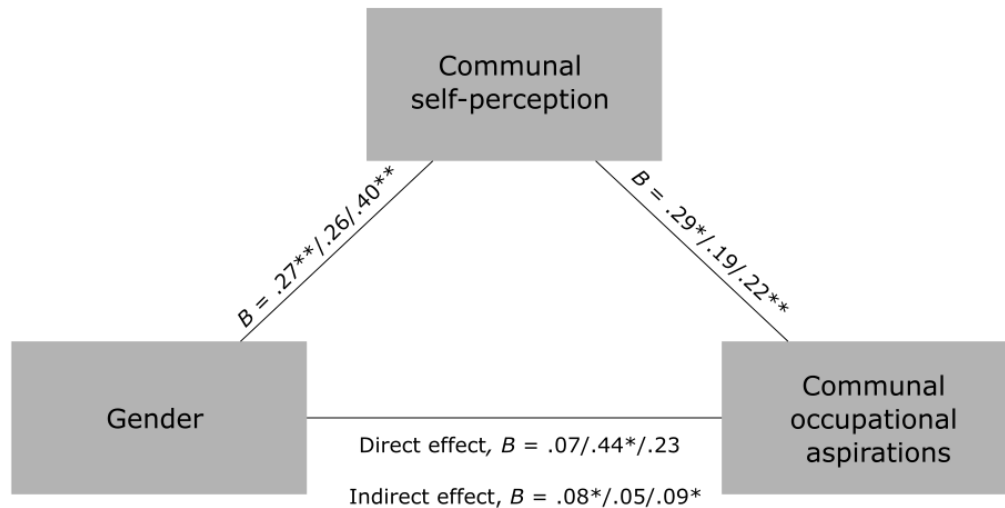
Regression Model

In order to investigate H1-3, we conducted a multiple regression analysis where we included gender, communal occupational gender stereotypes, and communal self-perceptions as main effects. We also included the interaction between gender and communal occupational gender stereotypes and between age and gender since we only found a main effect of gender in Study 2. Communal occupational aspirations was the dependent variable. The results of the regression analysis can be found in Table 5. In contrast to H1, the analyses did not reveal a significant main effect of gender on communal occupational aspirations, $B = .20$, $t(238) = 1.63$, $p = .106$, 95% CI [-0.04; 0.45]. The interaction between age and gender was also not significant, $B = .14$, $t(237) = .97$, $p = .414$, 95% CI [-0.14; 0.41]. However, in line with H2, the interaction between occupational gender stereotypes and gender on communal occupational aspirations was significant, $B = .27$, $t(238) = 2.19$, $p = .030$, 95% CI [0.03; 0.51]. Whereas there was no

significant effect of gender stereotypes on boys' communal occupational aspirations, $B = -.06$, $t(123) = -.77$, $p = .440$, 95% CI [-0.23; 0.10], girls' communal occupational aspirations significantly increased with increased gender stereotypes, $B = .19$, $t(114) = 2.07$, $p = .041$, 95% CI [0.01; 0.38]. Finally, in line with H3, the effect of communal self-perceptions on communal occupational aspirations was significant, $B = .24$, $t(237) = 3.86$, $p < .001$, 95% CI [0.12; 0.36], meaning that higher communal self-perceptions were related to greater aspirations toward communal occupations.

Mediation Analysis

Next, we conducted a mediation analysis using Hayes' Process macro (Model 4; 10,000 bootstrap samples). The mediating effect of communal self-perceptions on the relationship between children's gender and their communal occupational aspirations can be found in Figure 1. Gender was significantly associated with communal self-perceptions, $B = .40$, $p = .002$, 95% CI [0.15; 0.65], with girls reporting higher communal self-perceptions than boys. Communal self-perceptions in turn were positively associated with communal occupational aspirations, $B = .22$, $p = .001$, 95% CI [0.10; 0.34]. A bias-corrected bootstrap confidence interval for the indirect effect did not include zero, $B = 0.09$, 9



5% CI [0.03; 0.17] supporting H5. Gender did significantly predict communal aspirations independent of the mediator, $B = .23$, $p = .064$, 95% CI [-0.01; 0.47].

General Discussion

The present research investigated the development of communal occupational aspirations in early childhood. The aim was to identify factors that influence occupational aspirations in early and middle childhood. We investigated the effect of children's gender, communal occupational gender stereotypes, communal self-perceptions, and perceived salary on their communal occupational aspirations. Concerning the main effect of gender (H1), whereas no difference between boys' and girls' communal occupational aspirations was observed in the younger sample (Study 1), girls did aspire more to communal occupations than boys in the older sample (Study 2). When combining the two samples, we did not find a main effect of gender on

children's communal occupational aspirations when including gender as a main effect in the regression while controlling for other variables, but we did find it again in the mediation model. There seems to be a non-robust main effect of gender that disappears when controlling for other psychological variables that are related to children's concept of gender such as gender stereotypes.

Interestingly, however, both studies provide evidence for the role of gender stereotypes in communal occupational aspirations. Whereas the predicted interaction between gender and gender stereotypes was not significant in Study 1—but descriptively pointed in the predicted direction—in Study 2, this interaction between gender and gender stereotypes became significant, and this held when combining the two samples. This means that in line with role congruity theory (Eagly & Karau, 2002) and gender schema theory (Martin et al., 2002) children seem to want to behave in a congruent way with existing gender stereotypes. Results of the combined data set showed that this effect was mostly driven by girls: The more traditional gender stereotypes girls reported, the more they aspired towards communal aspirations. With the present data, it is not possible to differentiate between different underlying motivations of this effect. More research is needed to disentangle whether this effect is driven by girls' desire to achieve cognitive consistency as predicted by gender schema theory, or by the desire to avoid negative consequences from others as predicted by role congruity theory. This finding is nevertheless important since past research has mostly focused on the relationship between gender stereotypes and occupational aspirations in adolescents and young adults (Cundiff et al., 2013; Garriott et al., 2017), and there has been a lack of empirical evidence for this relationship in younger children (Hartung et al., 2005).

In addition, results of both studies and the combined samples showed that children's gendered self-concept in terms of their communal self-perceptions were related to communal occupational aspirations (H3) and that these self-perceptions mediated the relationship between child gender and occupational aspirations (H5). We believe the present results, together with the evidence from Block et al. (2018), suggest that Gottfredson's (1981) prediction that internal factors do not play a role in young children's occupational aspirations may need to be reconsidered. The fact that young girls and boys already differ in their self-views about their communality might explain why boys become less likely to aspire toward communal roles than girls the older they get. Children might internalize this gendered self-view and then adjust their occupational aspirations to this self-view. This is in line with both gender schema theory (see Martin et al., 2002) and role congruity theory (Diekmann et al., 2017; Eagly & Karau, 2002), which state that people view themselves in line with the stereotypes they have about their gender, which leads to these gender stereotypes being internalized and thus influencing their behavior. The gender difference we observe in the older children could therefore represent the internalization of these gender stereotypes, and accordingly explain why the effect of communal self-perceptions is not as strong in the older children.

Finally, in Study 2, we found that the perceived salary of the communal occupation was related to children's aspirations toward communal occupations, even when controlling for other important factors, supporting our exploratory H4. This means that the more money children believe a person makes in a specific communal occupation, the more they aspire toward this occupation. This result supports previous findings showing that the occupational aspirations of young children in middle childhood are influenced by power and status (Liben et al., 2001; Weisgram et al., 2010). When planning interventions to increase engagement in communal

occupations, researchers and decision makers should therefore consider the status of occupations, and particularly the perceived salary of communal occupations. Previous interventions have focused on using role models to influence children's occupational aspirations (see Olsson & Martiny, 2018); however, if the present pattern is robust, this may not be enough. Even at a young age, children need to perceive communal occupations as being desirable, which means that increasing the status of communal occupations should be included in interventions to increase communal occupational aspirations. Our findings suggest that factors previously thought to only influence children at an older age, like occupational status, do relate to children's aspirations already at elementary school age. Therefore, more work should be done to investigate predictors of occupational aspirations at different stages in childhood, especially as this has been underexamined in previous research.

Limitations

As outlined above, the present work makes important contributions regarding the development of communal occupational aspirations in young children. However, a first limitation that needs to be addressed is the cross-sectional design of both studies, which makes it impossible to draw causal conclusions. Whereas a causal interpretation of the present findings regarding gender and communal self-perceptions is in line with theory (Diekman et al., 2017), the direction of the effects of perceived status remains unclear. As we argued based on the theoretical approach by Gottfredson (1981), it may be that perceived status affects young children's occupational aspirations. However, it is of course also possible that children ascribed more salary to occupations that they perceive as more interesting and desirable. More (experimental) research is therefore needed to investigate the potential causal effect of perceived

status on children's occupational aspirations, for example by manipulating the ascribed status of occupations to see if this influences children's aspirations toward these occupations.

As a second limitation, in Study 2, the scales for communal occupational aspirations and the perceived salary of communal occupations referred to three occupations: stay-at-home parent, nurse, and kindergarten teacher. We used these three items because they had shown satisfactory reliability in Study 1. However, in the sample of older children, stay-at-home parent did not correlate highly with the other two communal occupations, perhaps because older children understand that staying at home is not an occupation. We therefore had to exclude this item from the communal occupational aspirations scale, the occupational gender stereotypes scale, and the perceived salary scale, resulting in scales consisting of only two items. To test whether these occupations are perceived as typical communal occupations by Norwegian children, we asked 139 (62 girls, 72 boys; $M_{age} = 9.34$, $SD = 1.18$) children to report which occupations they viewed as communal in an open-ended question in a separate study. 45.6% of occupations were categorized as healthcare including nurse and doctor and 24.1% were categorized as childcare including childcare center and schoolteacher, indicating that children view these occupations as communal. The full overview of occupations that children reported can be found in the Supplemental Materials. In addition, as can be seen in the Supplemental Material, the direction of results do not change when excluding stay-at-home parent from the analyses of Study 1 (they actually got stronger). Thus, we are confident to conclude that the two occupations can be used as examples for communal occupations in general in Norway. At the same time, further research should make sure to use scales that consist of more items and show a higher reliability. Finally, there is a need for longitudinal studies that investigate how predictors of occupational aspirations in children develop throughout childhood.

Conclusion

The present study addresses an underexamined but important question, namely factors that contribute to children's communal occupational aspirations that may ultimately explain men's underrepresentation in communal roles. The tendency for boys to identify less with communal behaviors than girls at an early age and in an egalitarian context is noteworthy. The relationship between gender, communal self-perceptions, and communal occupational aspirations suggests that girls and boys enter different career trajectories from early childhood on. Therefore, interventions seeking to increase communal self-perceptions in young boys are needed. When planning these interventions researchers and practitioners should consider also focusing on raising the perceived and real status of communal occupations.

Footnotes

¹ In order to increase readability in the present manuscript, we present the hypotheses of Study 1 and Study 2 in a slightly different order from how they were presented in the preregistrations (for original hypotheses, see preregistration on:

https://osf.io/cq3zf/?view_only=5cc42135af034628a932665247f59f2a and

https://osf.io/g2j8a/?view_only=1cb13e9d03b743dead99d2ad9e5868fc).

² Children first recorded their implicit gender stereotypes (in an auditory Stroop task) and their perceptions of one of their childcare center teachers, but these results are not included in this report.

³ Other variables collected as covariates include: gender of experimenter, exposure to gender incongruent role models, and bilingualism. Multiple regression analyses including these variables can be found in the Supplemental Materials.

⁴ Stay-at-home parent was removed as an item in the following scales: communal occupational aspirations, communal occupational gender stereotypes, and perceived salary for communal occupations. Removing this item did not change the results of the analyses. Analyses including stay-at-home parent as an item in the scales can be found in the Supplemental Materials.

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Tables and Figures

Table 1

Study 1: Descriptive Statistics and Correlations between Measures for Girls and Boys

	<i>N</i>	<i>M</i>	<i>SD</i>	1.	2.	3.	4.
1. Age (in months)	82/75	65.96/66.19	4.41/4.51	1			
2. GST ^a	84/74	0.37/0.50	0.64/0.65	-.01/-.10	1		
3. Communal self-perceptions ^b	84/74	2.22/2.49	0.62/0.55	-.01/.18	.02/-.02	1	
4. Communal aspirations ^b	84/75	1.79/1.93	0.69/0.66	-.20/-.10	.03/.23*	.37**/.46	1

Note. Statistics before / is for boys, after / is for girls; * $p < .05$. ** $p < .01$. GST = Gender stereotypes regarding communal roles; gender coding: boys = 1, girls = 2.

^a Measured as number of stereotypical responses from 0 (No stereotypical responses) to 3 (Only stereotypical responses)

^b Scale ranged from 1 (Not at all) to 3 (A lot)

Table 2

Regression Analysis with Communal Occupational Aspirations as the Outcome (Study 1; n = 156)

Variable	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
Intercept	2.71	.80		3.40	.001
Gender	.05	.11	.04	.49	.627
Age	-.03	.01	-.16	-2.10	.037
GST occupations	-.01	.123	-.01	-.04	.967
Communal self-perceptions	.29	.09	.26	3.31	.001
Gender X GST	.23	.17	.15	1.35	.179

Note. GST = Gender stereotypes; DV = communal occupational aspirations.

Table 3*Study 2: Descriptive Statistics and Correlations between Measures for Girls and Boys*

	<i>N</i>	<i>M</i>	<i>SD</i>	1.	2.	3.	4.	5.
1. Age	45/44	9.38/9.50	1.99/1.86	1				
2. GST occupations ^a	47/48	3.16/3.15	0.33/0.40	.12/.12	-1			
3. Perceived salary ^b	47/48	3.17/3.39	0.57/0.76	-.12/-.04	-.35*/.00	1		
4. Communal self-perceptions ^c	47/48	4.14/4.39	0.85/0.84	.08/-.27	-.15/-.44**	.14/.43**	1	
5. Communal aspirations ^c	47/48	1.39/1.99	0.63/1.14	-.26/-.01	-.28/.11	.19/.42**	.22/.17	1

Note. Statistics before / is for boys, after / is for girls; * $p < .05$. ** $p < .01$. GST = Gender stereotypes; gender coding: boys = 1, girls =

2. All other scales ranged from 1-5, with the exception of age.

^a Scale ranged from 1 (Only men) to 5 (Only women)

^b Scale ranged from 1 (Very little) to 5 (Very much)

^c Scale ranged from 1 (Not at all) to 5 (Very much)

Table 4

Regression Analyses with Communal Occupational Aspirations as the Outcome (Study 2; n = 89)

	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
Age	-.04	.05	-.08	-.78	.436
Gender	.44	.19	.23	2.26	.026
GST occupations	.46	.37	.18	1.24	.220
Communal self-perceptions	.23	.12	.21	1.91	.059
Gender X GST	-.91	.54	-.23	-1.69	.095

Note. DV = communal occupational aspiration; GST = Gender stereotypes.

Table 5

Regression Analyses with Communal Occupational Aspirations as the Outcome for the Combined Data of Study 1 and Study 2 (n = 245)

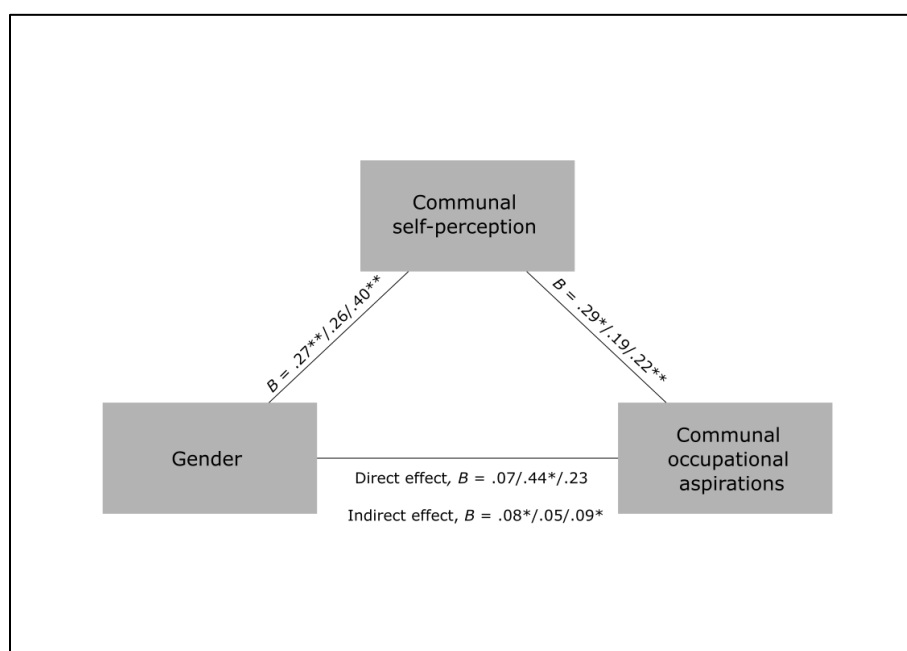
	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
Age	-.21	.10	-.18	-2.13	.034
Gender	.20	.12	.10	1.63	.106
GST occupations	-.07	.09	-.07	-.74	.462
Communal self-perceptions	.24	.06	.24	3.86	<.001
Gender X GST	.27	.12	.20	2.19	.030

Gender X Age	.14	.14	.08	.97	.336
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Note. DV = communal occupational aspiration; GST = Gender stereotypes.

Figure 1.

Mediating Effect of Communal Self-Perceptions on the Relationship Between Gender and Communal Occupational Aspirations in Study 1 (n = 156), Study 2 (n = 89), and with Combined Data (n = 245).



Note. $*p < .05$. Statistics are presented as such: Study 1 / Study 2 / Combined data.

Supplemental Materials

Supplement 1: Preregistration, Pilot Studies, and Procedure– Study 1

Deviation from the preregistration

As part of this data collection, we also recorded agentic self-perceptions and aspirations. The items measuring agentic roles (police, boss, $r = .27$) and behavior (compete, decide, $r = .24$) were only weakly correlated with each other. Therefore, we were unable to form composite scores for these variables and to test pre-registered hypotheses H3b, H4a, H5b. We also recorded children's gender stereotypes about these agentic roles and behaviors. Due to an error with the agentic materials during testing, which may have primed gender-stereotypical responses, we opted not to report gender stereotypes about agentic roles and behaviors (H1c, H1d, H2c, and H2d).

Pilot Studies

To test whether the behaviors and roles selected as stimulus materials for the main study were gender-typed in Norway we ran two pilot studies with adults. We drew behavioral items from past research on adults (e.g., caring for others; Diekman et al., 2010) and generated role items from a brainstorming session (e.g., nurse). In the first pilot study, we asked Norwegian adults ($N = 28$) to report descriptive gender stereotypes for a range of occupations/roles (e.g., “What % of kindergarten teachers in Norway are male?”). The participants reported their answers on a 100-point Likert scale that ranged from 0% to 100%. We also asked participants to report descriptive gender stereotypes for behaviors (e.g., “I associate comforting others with ...”). Participants reported their answers on a 7-point Likert scale that ranged from Only women (scored as 1) to Only men (scored as 7). The behaviors and roles that were stereotyped as either

female (i.e., mean score < 50% and < 4) or male (i.e., mean score > 50% and > 4) were then included in a second pilot study. In the second pilot, we provided Norwegian adults (N = 37) with definitions of communion and agency. We then asked participants to rate the extent to which they associated the stereotypically female and male roles and behaviors with communion and agency, respectively. Participants reported their answers on a 7-point Likert scale (1 = Not at all to 7 = Very much).

A third and fourth pilot study were run with kindergarten children. The aim of the third pilot study was to assess children's ability to understand and engage with the study materials. Children were presented with behaviors and roles from Pilots 1 and 2 which were highly gender stereotyped. Specifically, any behavior or role which was associated with women (i.e., mean score < 50% and < 4) and rated as high in communion (i.e., mean score > 4), or associated with men (i.e., mean score > 50% and > 4) and agency (i.e., mean score > 4). The experimenters described behaviors of people (e.g., "I know someone who likes to comfort others if they see that they are sad") and asked the children (N = 8) "Do you know someone who behaves like that?" The experimenters took a record of the children's reactions and responses. The experimenters also showed participants images related to different jobs (e.g., an image depicting a doctor's coat and stethoscope) and asked: "What job is depicted here?" and "Do you know what working as a [...] involves?". From the items which children ostensibly appeared to understand (i.e., the children did not appear hesitant or confused by the descriptions or images) we selected the behaviors and roles that (Pilots 1 and 2 had identified) were mostly associated with women and communion or men and agency for the main study.

In a fourth pilot study, the experimenters assessed the study length and observed children's (N = 8) ability to concentrate, and to understand and use a 3-point smiley face Likert

scale. This pilot study showed that four to six-year-old children were able to maintain concentration for the duration of the study. We piloted smiley Likert scales with different face anchors (angry, neutral, little happy). Previous research by Hall et al. (2016) has shown that children do not tend to select negative or neutral smiley options. However, we found that children in the pilot study repeatedly chose the negative face option. We thus opted for a negative smiley face anchor.

Procedure

Participants were tested in groups of up to four by two experimenters. The experimenters either took the role of the interviewer (i.e., reading the instructions aloud to participants) or the role of the secretary (i.e., taking notes and assisting participants if needed). For each testing, one female and one male experimenter was present. The testing took place in a separate room in the childcare center. Children were seated at a table in a row facing the interviewer. The secretary sat next to the children. Children were seated as far away from each other as possible (depending on the layout and furnishing of the testing room). The experimenters repeatedly reminded the children not to talk to each other and not to look at each other's tablets, but to keep their answers secret from one another.

Prior to the testing, the experimenters recorded the child's gender, whether they were bilingual, and if so in what languages. Children were informed that they could terminate their participation in the study at any time without being penalized for doing so. After verbal consent was gained from each child, the testing commenced. Children were each given a tablet to record their responses. In order to familiarize the children with the use of Likert scales, the interviewer ran two training items (how much do you like ice cream? how do you feel when your parents tell you that you are no longer allowed to watch TV?). Children subsequently recorded their

aspirations toward a range of occupations and their preference toward communal behaviors, followed by the degree to which they gender stereotyped these occupations and behaviors². If a child refused to answer a particular question, the experimenter gave a random response on the tablet in order for the child to proceed with the subsequent question. Such instances were recorded by the experimenter and these data points were treated as missing values in the data file.

Supplement 2: Measures – Study 1

Images Used to Illustrate Communal Aspirations

Figure S1

Stay-at-Home Parent



Figure S2

Nurse

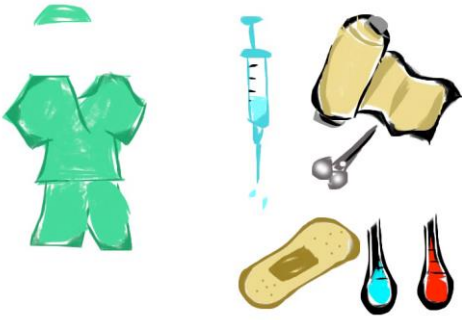


Figure S3

Preschool Teacher



Images used for Likert Scale Options

Figure S4

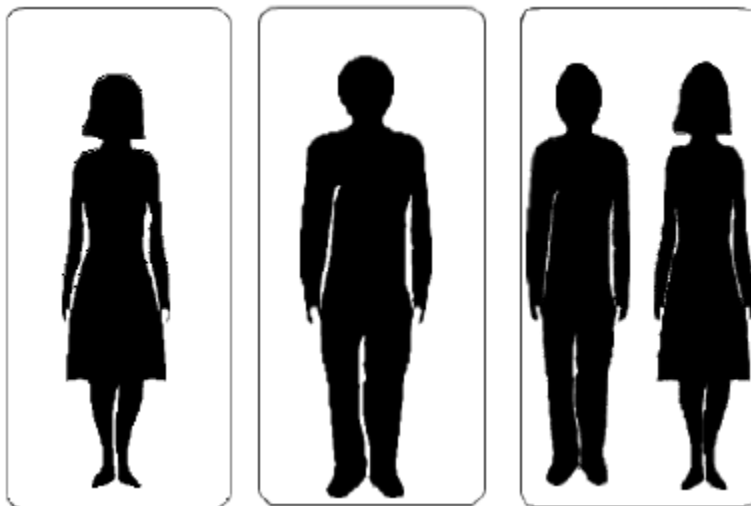
Not at all, A little, A lot



Images Used for Gender Stereotypes

Figure S5

Only Girls, Only Boys, Both Boys and Girls



Item Descriptions in Norwegian and English

Communal Occupational Aspirations

English. “I can imagine that you have thought about what you want to be when you grow up. When I went to kindergarten and thought about what I wanted to be when I grew up, I wanted to be so many things, not just one thing. I will now show you a few images of people who have

different jobs. Although you might have decided what job you want to do later in life, I want you to tell me how much you would like to do this job.”

Experimenter shows image of [...]

(1) [nurse] “What have we got here? Plasters and syringe. Who uses this? A Nurse who cares for people who are sick. Would you like to be a nurse when you grow up?”

(2) [stay-at-home parent] “What have we got here? Someone who feeds a baby. Who does that? Someone who does not work but stays at home and looks after their baby instead. Would you like to stay at home and look after your baby when you grow up?”

(3) [preschool teacher] “What have we got here? There are children here. Who looks after children? A preschool teacher. Would you like to be a preschool teacher when you grow up?”

“Press on the face that does not smile if you disagree, press on the face with the little smile if you agree a little bit, or press on the face with the big smile if you agree a lot.”

Norwegian. “Jeg kan tenke meg at du har tenkt på hva du har lyst til å jobbe med når du blir stor. Da jeg gikk i barnehagen og tenkte på hva jeg ville bli når jeg ble stor, så hadde jeg lyst til å bli mange ting, ikke bare en ting. Nå skal jeg vise deg noen bilder av forskjellige jobber. Selv om du kanskje har bestemt deg for hvilken jobb du vil ha, vil jeg at du skal prøve å se for deg å ha denne jobben og fortelle meg hvor mye du hadde likt å ha denne jobben.»

Eksperimentleder viser bilde av [...]

(1) [sykepleier] “Hva er det vi har her? Plaster og en sprøyte. Hvem bruker dette. En sykepleier som tar vare på de som er syke. Hvor mye har du lyst til å bli en sykepleier når du blir stor?»

(2) [passe på baby] Hva er det vi har her? Noen som mater en baby. Hvem gjør dette? Noen som er hjemme og passer på babyen sin. Hvor mye har du lyst til å være hjemme og å passe på babyen din når du blir stor?»

(3) [barnehagelærer] “Hva er det vi har her? Det er barn her. Hvem passer på barn? En barnehagelærer. Hvor mye har du lyst til å bli en barnehagelærer når du blir stor?”

«Hvis du ikke har lyst til å bli [...] I det hele tatt, så trykker på fjeset som ikke smiler. Hvis du har litt lyst til å bli [...] så trykker du på fjeset med det lille smilet. Hvis du har kjempelyst til å bli [...] så trykker du på fjeset med det store smilet.»

Communal Self-Perceptions

English. “I will now read short stories about some children I know. It is your job to tell me whether this child sounds like you.”

(1) “I know a child who tries to help other children, if they see that they are upset. Does this sound like you?”

(2) “I know a child who really, really likes to be together with others and be close to others. Does this sound like you?”

(3) “I know a child who really, really likes to hug others and this child always gives hugs to other children. Does this sound like you?”

(4) “I know a child who always comforts others when they see that they are upset. Does this sound like you?”

“Press on the face that does not smile if you disagree, press on the face with the little smile if you agree a little bit, or press on the face with the big smile if you agree a lot.”

Norwegian. “I will now read short stories about some children I know. It is your job to tell me whether this child sounds like you.”

(1) “Jeg vet om et barn som prøver å hjelpe, hvis de ser at et annet barn er trist eller lei seg. Pleier du å hjelpe andre barn som er lei seg?»

(2) “Jeg vet om et barn som virkelig, virkelig liker å være sammen med andre og være nær andre. Liker du å være sammen med andre og være nær andre?»

(3) “Jeg vet om et barn som virkelig, virkelig liker å klemme andre. Dette barnet gir alltid klemmer til andre barn. Liker du å klemme andre?»

(4) “Jeg vet om et barn som alltid trøster andre hvis de er triste eller lei seg. Pleier du å trøste andre som er lei seg?»

“Hvis du ikke [...] I det hele tatt, så trykker du på det fjeset som ikke smiler. Hvis du [...] litt, så trykker du på fjeset med det lille smilet. Hvis du [...] veldig mye, så trykker du på fjeset med det store smilet.”

Descriptive Gender Stereotypes of Communal Occupations

English. “I will now ask some questions about different jobs. I want you to tell me who you think can do this job.”

(1) [image of nurse] “This is an image of a nurse. Who do you think can be a nurse? Only boys? Only girls? Or, both boys and girls?”

(2) [image of stay-at-home parent] “This is an image of someone who does not work but instead stays at home and looks after their baby. Who do you think can stay at home from work and look after their baby? Only boys? Only girls? Or, both boys and girls?”

(3) [image of kindergarten teacher] “This is an image of a kindergarten teacher. Who do you think can be a kindergarten teacher? Only boys? Only girls? Or, both boys and girls?”

“If you think only boys can be a [...], press the picture of the boy. If you think only girls can be [...], press the picture of the girl. If you think that both boys and girls can be [...], press the picture of the boy and girl.”

Norwegian. “Nå skal jeg stille dere noen spørsmål om jobb. Jeg vil vite hvem du tror kan ha disse jobbene.»

(1) [bilde av en sykepleier] “Dette er et bilde av en sykepleier. Trykk på sykepleieren. HVEM av disse tror dere kan være sykepleier? Bare gutter? Bare jenter? Eller, både gutter og jenter?”

(2) [bilde av noen som passer på baby] “Dette er et bilde av noen som ikke går på jobb, men som blir hjemme og passer på babyen sin i stedet. Nå kan du trykke på babyen en gang. HVEM tror du kan bli hjemme og passe på babyen sin I stedet for å jobbe? Bare gutter? Bare jenter? Eller, både gutter og jenter?”

(3) [bilde av en barnehagelærer] “Dette er et bilde av en barnehagelærer. Nå kan du trykke på barnehagelæreren en gang. HVEM tror du at kan bli en barnehagelærer? Bare gutter? Bare jenter? Eller, både gutter og jenter?”

“Hvis du synes at bare gutter kan bli [...], trykk på bildet av gutten. Hvis du synes at bare jenter kan bli [...], så klikk på bildet av jenta. Hvis du synes at både gutter og jenter kan bli [...], så trykker du på bildet med både en gutt og en jente på.»

Descriptive Gender Stereotypes of Communal Behavior

“Nå skal jeg lese noen korte fortellinger for dere om noen jeg kjenner. Du skal prøve å finne ut av om denne personen i fortellingen er lik de fleste andre jenter, de fleste andre gutter, eller lik både gutter og jenter.”

(1) “Jeg kjenner noen som virkelig, virkelig vil hjelpe andre hvis de ser at noen andre er triste eller lei seg.»

(2) “Jeg kjenner noen som virkelig, virkelig liker å være sammen med andre og være nær andre.»

(3) “Jeg kjenner noen som virkelig, virkelig liker å klemme andre. Denne personen gir alltid klemmer til andre.”

(4) “Jeg kjenner noen som alltid trøster andre hvis de ser at noen andre er triste eller lei seg.»

“Hvis du synes at personen som jeg snakker om i fortellingen minner deg mest om gutter, så trykker du på bildet av en gutt. Hvis du synes at personen i historien minner deg mest om jenter, så trykker du på bildet av en jente. Hvis du synes at personen minner deg om både gutter og jenter, så trykker du på bildet av både gutten og jenta.»

Supplement 3: Descriptive Statistics – Study 1

Gender Differences in Gender Stereotyping of Occupations

Table S1.

Cross Tabulation of Child's Gender and Descriptive Gender Stereotypes of Communal Occupations

Variable	Gender	
	Boys	Girls

Nurse		
Only men	13 _a	1 _b
Only women	7 _a	13 _a
Both men and women	64 _a	60 _a
Stay-at-home parent		
Only men	14 _a	4 _b
Only women	15 _a	16 _a
Both men and women	55 _a	54 _a
Preschool teacher		
Only men	8 _a	6 _a
Only women	9 _a	8 _a
Both men and women	67 _a	60 _a

Note. Significant gender differences at the Bonferroni-corrected α .016 level are represented by different subscript letters.

Table S2.

Cross Tabulation of Child's Gender and Descriptive Gender Stereotypes of Communal Behaviors

Variable	Gender	
	Boys	Girls
Help		
Only men	27 _a	8 _b

Only women	7 _a	24 _a
Both men and women	48 _a	41 _a
Being close		
Only men	34 _a	7 _b
Only women	9 _a	20 _b
Both men and women	39 _a	46 _a
Hug		
Only men	21 _a	10 _b
Only women	9 _a	23 _b
Both men and women	42 _a	37 _a
Comfort		
Only men	17 _a	3 _b
Only women	15 _a	24 _a
Both men and women	37 _a	42 _a

Note. Significant gender differences at the Bonferroni-corrected α .016 level are represented by different subscript letters.

Supplement 4: Regression Analyses Including All Covariates and Interactions – Study 1

Table S3.

Regression Analysis Including All Interactions

Variable	B	SE(B)	β	t	Sig. (<i>p</i>)
Intercept	2.86	1.18		2.43	.016
Age	-.03	.02	-.20	-1.78	.077

Gender	.06	.11	.04	.55	.584
GST	-.00	.12	-.00	-.03	.979
Self-perception	.40	.12	.36	3.43	<.001
Gender X Age	.02	.03	.08	.65	.516
Gender X GST	.23	.17	.15	1.37	.174
Gender X Self-perception	-.27	.18	-.15	-1.46	.148
Age x GST	.00	.02	.01	.12	.902
Age X Self-perception	.00	.02	.01	.12	.906

Note. DV = communal occupational aspirations; GST = gender stereotypes

Table S4.

Regression Analysis of All Predictors on Communal Occupational Aspirations, Including All Covariates.

Variable	B	SE(B)	β	t	Sig. (p)
Intercept	3.15	.85		3.69	<.001
Age	-.03	.01	-.19	-2.35	.020*
Gender	.07	.11	.05	.65	.519
Bilingualism	.08	.17	.04	.47	.640
Gender of experimenter	-.06	.11	-.04	-.51	.611
Exposure to male preschool teachers	-.30	.11	-.22	-2.71	.009*
Communal self-perception	.30	.10	.27	3.20	.002*

GST	-.05	.13	-.05	-.42	.679
Gender X GST	.30	.17	.20	1.73	.086

Note. * = significant at $p < .05$; DV = communal occupational aspirations; GST = gender stereotypes

Supplement 5: Stepwise Regression Analysis – Study 1

Table S5.

Stepwise Regression Analysis of Predictors on Communal Occupational Aspirations

Model	Variable	B	SE(B)	β	t	Sig. (p)
1	Intercept	3.17	.82		3.88	<.001
	Age	-.02	.01	-.15	-1.92	.057
	Gender	.15	.11	.11	1.37	.173
2	Intercept	3.10	.82		3.80	<.001
	Age	-.02	.01	-.15	-1.85	.066
	Gender	.13	.11	.10	1.18	.240
	GST	.11	.09	.10	1.28	.201
3	Intercept	2.72	.80		3.41	<.001
	Age	-.03	.01	-.17	-2.16	.033*
	Gender	.05	.11	.04	.45	.653
	GST	.11	.09	.10	1.34	.183
	Communal self-perceptions	.29	.09	.26	3.29	.001*
4	Intercept	2.71	.80		3.40	<.001

Age	-.03	.01	-.16	-2.10	.037*
Gender	.05	.11	.04	.49	.627
GST	-.01	.12	-.01	-.04	.967
Communal self-perceptions	.29	.09	.26	3.31	.001*
Gender X GST	.23	.17	.15	1.35	.179

Note. DV = Communal occupational aspirations; GST = Gender stereotypes; * = $p < .05$.

Supplement 6: Regression Model Without Stay-at-Home Parent in Scales

Table S6.

Regression Analyses Using Scale Without Stay-at-Home Parent






Variable	B	SE(B)	β	t	Sig. (p)
Intercept	2.34	.83		2.83	.005
Age	-.02	.01	-.10	-1.33	.186
Gender	-.04	.13	-.03	-.35	.726
GST	-1.14	.43	-.70	-2.67	.008*
Communal self-perception	.24	.09	.20	2.56	.011*
Gender X GST	.79	.26	.84	3.10	.002*

Note. * = significant at $p < .05$; DV = communal occupational aspirations; GST = gender stereotypes

Supplement 7: Measures – Study 2

Table S7.






Items about the children's communal occupational aspirations

Language	Item						
	Instructions	Text	Scale points				
Scale visualizations							
English	How much would you like to be a ... when you grow up?	Nurse	Not at all	A little	Some	Quite much	Very much
		Kindergarten teacher	Not at all	A little	Some	Quite much	Very much
		Stay-at-home parent	Not at all	A little	Some	Quite much	Very much
Norwegian	Hvor mye har du lyst til å bli ... når du blir stor?	Sykepleier	Ikke i det hele tatt	Litt	Noe	Ganske mye	Veldig mye
		Barnehagelærer	Ikke i det hele tatt	Litt	Noe	Ganske mye	Veldig mye

		hele					
		tatt					
	Være hjemme med barna dine	Ikke i det	Litt	Noe	Ganske	Veldig mye	
		hele					
		tatt					

Table S8.


Items About the Children's Communal Self-Perceptions

Language	Item						
	Instructions	Text	Scale points				
Scale visualizations							
English	Do you like to...?	Help other children when they are in pain	Not at all	A little	Some	Quite much	Very much
		Be with other children	Not at all	A little	Some	Quite much	Very much

		Comfort	Not at	A little	Some	Quite	Very
		other	all			much	much
		children					
		when they					
		are sad					
Norwegian	Liker du å	Hjelpe andre	Ikke i	Litt	Noe	Ganske	Veldig
	...?	barn når de	det hele				mye
		har det vondt	tatt				
		Være	Ikke i	Litt	Noe	Ganske	Veldig
		sammen med	det hele				mye
		andre barn	tatt				
		Trøste andre	Ikke i	Litt	Noe	Ganske	Veldig
		barn når de er	det hele				mye
		lei seg	tatt				

Table S9.






Items About the Children's Occupational Gender Stereotypes Towards Communal Occupations

Language	Item		
	Instructions	Text	Scale points
Scale			
visualizations			

English	Who can be a ...?	Nurse	Only men	Mostly men	Both women and men	Mostly women	Only women
		Kindergarten teacher	Only men	Mostly men	Both women and men	Mostly women	Only women
		Stay-at-home parent	Only men	Mostly men	Both women and men	Mostly women	Only women
Norwegian	Hvem kan være en...?	Sykepleier	Bare menn	Flest menn	Både kvinner og menn	Flest kvinner	Bare kvinner
		Barnehagelærer	Bare menn	Flest menn	Både kvinner og menn	Flest kvinner	Bare kvinner
		Hjemme med barna	Bare menn	Flest menn	Både kvinner og menn	Flest kvinner	Bare kvinner

Table S10.

Items About the Children's Perceived Salary for Communal Occupations (OWN)

Language	Item						
	Instructions	Text	Scale points				
Scale visualizations							
English	How much money do you think a ... earns?	Nurse	Very little	Little	Average	Much	Very much
		Kindergarten teacher	Very little	Little	Average	Much	Very much
		Stay-at-home parent	Very little	Little	Average	Much	Very much
Norwegian	Hvor mye penger tror du en ... tjener?	Sykepleier	Veldig lite	Lite	Sånn passe	Mye	Veldig mye
		Barnehagelærer	Veldig lite	Lite	Sånn passe	Mye	Veldig mye
		Hjemme med barna	Veldig lite	Lite	Sånn passe	Mye	Veldig mye

Supplement 8: Analyses with Interactions – Study 2

Table S13.

Regression Analysis Including All Interactions

Variable	B	SE(B)	β	t	Sig. (<i>p</i>)
Intercept	-1.69	2.01		-.84	.402
Age	.01	.08	.02	.12	.906
Gender	.45	.20	.24	2.25	.028*
GST	.21	.46	.08	.47	.643
Self-perception	.02	.23	.01	.07	.949
Perceived salary	.57	.22	.40	2.55	.013*
Gender X Age	-.08	.11	-.12	-.76	.451
Gender X GST	-.71	.61	-.18	-1.16	.249
Gender X Self-perception	.14	.29	.09	.48	.636
Gender X Perceived salary	-.52	.34	-.23	-1.54	.128
Age X GST	.16	.22	.10	.72	.476
Age X Self-perception	.03	.07	.06	.46	.645
Age X Perceived salary	.03	.10	.04	.34	.737

Note. * = significant at $p < .05$; DV = communal occupational aspirations; GST = gender stereotypes

Supplement 9: Stepwise Regression Analyses of Predictors – Study 2

Table S14.

Stepwise Regression Analysis

Model	Variable	B	SE(B)	β	t	Sig. (<i>p</i>)
1	Intercept	1.28	.48		2.66	.009
	Age	-.05	.05	-.10	-.96	.342
	Gender	.50	.19	.26	2.54	.013*
2	Intercept	1.59	.96		1.65	.102
	Age	-.05	.05	-.09	-.90	.372
	Gender	.49	.20	.26	2.49	.015*
	GST	-.10	.27	-.04	-.37	.710
3	Intercept	-.24	1.12		-.21	.882
	Age	-.04	.05	-.08	-.78	.437
	Gender	.43	.19	.23	2.30	.024*
	GST	.05	.27	.02	.18	.858
	Perceived salary	.42	.15	.30	2.89	.005
4	Intercept	-.79	1.27		-.62	.535
	Age	-.04	.05	-.08	-.74	.461
	Gender	.41	.19	.22	2.18	.032*
	GST	.12	.28	.05	.42	.674
	Perceived salary	.38	.15	.27	2.50	.014*
	Communal self-perceptions	.11	.12	.10	.93	.356
5	Intercept	-1.78	1.47		-1.20	.232
	Age	-.04	.05	-.07	-.72	.47
	Gender	.41	.19	.22	2.18	.032*

GST	.43	.37	.16	1.17	.247
Perceived salary	.35	.16	.24	2.23	.028*
Communal self-perceptions	.14	.12	.13	1.17	.247
Gender X GST	-.69	.54	-.18	-1.29	.201

Note. DV = Communal occupational aspirations; GST = Gender stereotypes; * = $p < .05$.

Supplement 10: Exploring Correlations Between Gender Stereotypes and Occupational Aspirations – Study 2

Through the inclusion of perceived salary as a predictor, both the interaction between gender and gender stereotypes, $B = -.69$, $t(82) = -1.29$, $p = .201$, 95% CI [-1.76; 0.38], and the effect of communal self-perceptions, $B = .14$, $t(82) = 1.16$, $p = .247$, 95% CI [-0.10; 0.39] were reduced. In order to explore why the interaction effect of gender and occupational gender stereotypes was reduced when including perceived salary in the regression model, we investigated the correlation between occupational gender stereotypes and communal occupational aspirations for boys and girls separately. For boys, the correlation between aspirations and gender stereotypes approached significance, $r = -.28$, $p = .057$, whereas this correlation was non-significant for the girls, $r = .11$, $p = .461$. We tested the correlation between occupational gender stereotypes and communal occupational aspirations when controlling for the effect of perceived salary for girls and boys separately. Partial correlations showed that the correlation between boys' gender stereotypes and aspirations is reduced, $r = -.23$, $p = .118$, whereas this effect is almost unchanged among the girls, $r = .12$, $p = .427$, when controlling for perceived salary. This could indicate that part of the gender stereotypes that boys have about communal occupations is that people do not earn well in communal occupations, which makes the occupations unattractive for boys.

Supplement 11: Analyses Including Stay-at-Home Parent in Scales – Study 2

The regression analysis of the relevant predictors effect on communal occupational aspirations was repeated including stay-at-home parent as an item in scales.

Table S15.

Regression Analysis Including Stay-at-Home Parent as an Item in Scales

	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
Intercept	7.52	2.68		2.81	.006
Age	-.06	.05	-.12	-1.26	.213
Gender	-4.46	1.68	-2.60	-2.65	.010*
GST	-2.09	.80	-.82	-2.63	.010*
Self-perceptions	.09	.10	.09	.90	.369
Perceived salary	.28	.16	.19	1.81	.074
Gender X GST	1.50	.54	2.80	2.80	.006*

Note. DV = communal occupational aspiration; GST = Gender stereotypes; * = $p < .05$.

Supplement 12: Analyses Using Stay-at-Home Parent as a Single Item – Study 2

The regression analyses of the relevant predictors effect on communal occupational aspirations were repeated using stay-at-home parent as a single item for the measure of communal occupational aspirations, occupational gender stereotypes towards communal occupations, and perceived salary for communal occupations. Gender and age was included in all analyses as a covariate.

Gender Difference in Aspirations Towards Being Stay-at-Home Parent.

Table S16.

Regression Analysis of Gender on Aspirations Towards Being a Stay-at-Home Parent

Variable	B	SE(B)	β	t	Sig. (p)
Intercept	3.65	.75		4.87	<.001
Age	-.09	.08	-.12	-1.16	.250
Gender	-.13	.30	-.05	-.42	.673

Note. DV = Aspirations towards being a stay-at-home parent.

Communal Self-Perceptions Effect on Aspirations Towards Being Stay-at-Home Parent.

Table S17.

Regression Analyses of Communal Self-Perceptions on Aspirations Towards Being a Stay-at-Home Parent

Variable	B	SE(B)	β	t	Sig. (p)
Intercept	3.88	1.07		3.64	<.001
Age	-.09	.08	-.13	-1.18	.243
Gender	-.12	.31	-.04	-.37	.711
Communal self-perceptions	-.05	.18	-.03	-.30	.766

Note. DV = Aspirations towards being a stay-at-home parent

Occupational Gender Stereotypes' Effect on Aspirations Towards Being Stay-at-Home Parent.

Table S18.

Regression Analyses of Gender Stereotypes About Stay-at-Home Parents on Aspirations Towards Being a Stay-at-Home Parent

Variable	B	SE(B)	β	t	Sig. (p)
Intercept	7.83	2.80		2.79	.007
Age	-.08	.08	-.11	-.98	.331
Gender	-2.33	1.67	-.82	-1.40	.165
GST	-1.35	.87	-.57	-1.54	.127
Gender x GST	.69	.52	.87	1.33	.188

Note. DV = Aspirations towards being a stay-at-home parent.

Perceived Salary Effect on Aspirations Towards Being Stay-at-Home Parent. The effect of perceived salary for stay-at-home parents on aspirations towards being a stay-at-home parent approaches significance, $B = .27$, $t(93) = 1.88$, $p = .063$. This means that the more money the children believe you make as a stay-at-home parent, the more they aspire towards being a stay-at-home parent. Overall model is not significant, $R^2 = .19$, $F(2, 93) = 1.81$, $p = .169$.

Table S19.

Regression Analyses of Perceived Salary for Stay-at-Home Parents on Aspirations Towards Being a Stay-at-Home Parent

Variable	B	SE(B)	β	t	Sig. (p)
Intercept	3.37	.77		4.40	<.001
Age	-.10	.08	-.14	-1.31	.193

Gender	-.15	.30	-.05	-.49	.628
Perceived salary for stay-at-home parents	.24	.15	.17	1.55	.125

Note. DV = Aspirations towards being a stay-at-home parent

Supplement 13: Regression Analysis with All Covariates – Combined Data

Table S20.

Regression Analyses Including Study as a Covariate

	<i>B</i>	<i>SE B</i>	β	<i>t</i>	<i>p</i>
Intercept	-.82	.31		-2.64	.009
Study	.26	.17	.13	1.50	.134
Gender	.53	.20	.27	2.71	.007*
GST	-.03	.09	-.03	-.36	.722
Self-perceptions	.24	.06	.24	3.95	<.001
Gender X GST	.25	.12	.18	2.09	.037
Gender X Study	.46	.25	.18	1.87	.062

Note. DV = communal occupational aspiration; GST = Gender stereotypes.

Supplement 14: Table of Communal Occupations Reported by Elementary School

Children

Table S21.

Overview of Communal Occupations Reported by Elementary School Children in Open-Ended Question

Category of occupation	Occupation	Number	Percentage
Childcare	Babysitter	1	0.5%
	Child protective services	1	0.5%
	Orphanage	1	0.5%
	Childcare center teacher	18	9.7%
	Principal	1	0.5%
	School teacher	23	12.4%
	Total	45	24.1%
Healthcare	Ambulance	2	1.1%
	Dentist	5	2.7%
	Doctor	27	14.5%
	Healthcare assistant	1	0.5%
	Hospital	15	8.1%
	Nurse	26	14.0%
	Nursing home	3	1.6%
	Nutritionist	1	0.5%
	Physical therapist	1	0.5%
	Psychologist	3	1.6%
	Therapist	1	0.5%
	Total	85	45.6%
Other	Advisor	1	0.5%

All occupations	7	3.8%
Car	1	0.5%
Water tester	3	1.6%
Coach	1	0.5%
Dogsitter	1	0.5%
Farmer	1	0.5%
Firefighter	6	3.2%
Hotel	1	0.5%
Leader	1	0.5%
Military	1	0.5%
Model	1	0.5%
NRK (TV-channel)	1	0.5%
Pastry chef	1	0.5%
Police	10	5.4%
President	1	0.5%
Prime minister	1	0.5%
Red cross	1	0.5%
Restaurant	1	0.5%
Sales	1	0.5%
Save the children	1	0.5%
Store	5	2.7%
Theater	1	0.5%
University	1	0.5%

Veterinarian	4	2.2%
Zoo	1	0.5%
<hr/>		
Total	55	28.9%
<hr/>		