Heteronormativity and gender norms: socialization across countries, at school, and within the family

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Chapter 3

Hidden in plain sight: Gender bias and heteronormativity in Dutch textbooks

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The concept and layout for this study were jointly created by the authors. The majority of the manuscript was written by Tessa van de Rozenberg, who also carried out the analyses. Marleen Groeneveld, Lotte van der Pol, and Judi Mesman contributed significantly to the development of the manuscript by giving detailed feedback on the analyses and manuscript multiple times. The textbooks were coded by a team of 21 students, who were trained and supervised by Tessa van de Rozenberg and Daudi van Veen. Data preparations and additional coding were carried out by all authors. The study on which this chapter is based was presented at SSH-Conference NWO-Synergy, (Utrecht, 2020), the Conference of Dutch Society for Developmental Psychology (Utrecht, 2020), the Kennisfestival Onderwijs Cultuur en Wetenschap (Den Haag, 2021), and the Conference Upsetting Binaries and Hierarchies (Leiden University, 2022). The study benefitted from the comments from participants of these meetings and from anonymous reviewers.

Published in Educational Studies, 2023
DOI: 10.1080/00131946.2023.2194536

Abstract

In this study, we examined gender and sexuality representation in language and math textbooks for Dutch secondary education. We analyzed all male and female characters in 13 language textbooks (N = 7,347) and 12 math textbooks (N = 4,591). Our results confirmed our expectations based on the theory of the hidden curriculum: female characters were underrepresented in all textbooks (40% in language, 44% in math textbooks), but overrepresented in household tasks and EHW (Education, Health, and Welfare) professions. Male characters were overrepresented in occupational roles, especially in STEM (Science, Technology, Engineering, and Math) professions and technical tasks. Further, female characters in language textbooks were overrepresented in parental roles, and male characters were overrepresented among characters with disharmonious traits and behaviors. We found no characters from sexual minorities in any of the textbooks. In conclusion, in line with theories of the hidden curriculum, Dutch textbooks include gender stereotypic messages and are heteronormative. These findings are relevant in light of previous studies demonstrating the negative impact of these biases on children. Publishers and schools that want to be more inclusive are recommended to be more critical in their selection of stories and role models in their books.

3.1 Introduction

Textbooks are a mandatory part of the everyday lives of school children, are seen as authoritative sources of information (Blumberg, 2008), and also socialize children with messages conveying cultural norms, beliefs, and values (Kentli, 2009). These messages also include gender stereotypes that could influence children's beliefs about appropriate roles and behavior for men and women and add to the societal pressure to behave according to gender norms (Evans & Davies, 2000; Lee, 2014). Gender bias in representation, roles, and characteristics in textbooks has been demonstrated in several countries (Blumberg, 2008; Islam & Asadullah, 2018). In the current study, we examine quantitatively examine Dutch textbooks regarding (1) the extent of male and female representation in terms of 3 indicators of frequency and prominence; (2) the stereotypical representation of male and female characters in terms of 8 indicators of social roles, occupational roles, activities, social-emotional behaviors; (3) the representation of characters from sexual minorities in terms of frequency.

According to Article 28 of the Convention on the Rights of the Child, education should help children to fully develop their personalities, talents, and abilities. School textbooks that convey stereotypical messages about normative gender roles and/or exclude characters from sexual minorities can be at odds with this aim, as they form a hidden obstacle to gender equality (Blumberg, 2008; Evans & Davies, 2000; Ruiz-Cecilia et al., 2021; UNESCO, 2017). The potential socializing force of such obstacles is described by the theory of the hidden curriculum in education that distinguishes the formal curriculum and the hidden curriculum (Kentli, 2009). The first is officially recognized and openly specifies what learners are intended to learn, while the second contains knowledge that is not (officially) openly intended, is always normative, and reinforces dominant beliefs, values, and norms (Giroux & Penna, 1979; Lee & Mahmoudi-Gahrouei, 2020), such as gender messages (Lee, 2014). Examining these messages in the hidden curriculum provides valuable insight into values and power relations in society (Deckman et al., 2018; Kentli, 2009), and how these are reflected in learning materials for children.

Within the hidden curriculum, two types of hiddenness can be distinguished: the intended and the unintended (Lee, 2014). For intended hiddenness, messages are there on purpose, and educators are aware of the cultural messages in the materials, even though they are not openly presented. For example, the exclusion of LGBTQ+ characters can be done purposely to suit the norms and values of the schools that select these books, even though the publishers do not specifically mention that there are no such characters in these books and why. For unintended hiddenness, such messages are not there on purpose, such as when male characters are more often presented in occupational roles compared to female characters (Moser & Hannover, 2014). This is not intentional, but a reflection of the unconscious biases of the writers and illustrators of textbooks. Both types of hidden norms potentially convey gender norms and stereotypes to readers.

Gender stereotypes are 'culturally shared assumptions and expectations about sex differences in abilities, personality traits, activities, and roles' (Weinraub et al., 1984, p. 1493). According to gender schema theory, gender stereotypic messages are processed by children in gender schemas, i.e., cognitive structures containing gender-related information based on cultural norms (Bem, 1981, 1983). When children repeatedly receive the message that a certain trait, behavior, or activity, like being good at math or taking a leading role, is often ascribed to boys and men, they will categorize these as masculine in their gender schemas. Subsequently, these gender schemas influence perceptions of the world and children's own identity (e.g., Boys are good at math. I am a boy, therefore I am likely to be good at math). Adolescents are exposed to various sources of gender messages, including parents, peers, media, and school (Kågesten, 2016). In this paper, we focus on school textbooks.

Gender messages in textbooks can add to children's gender schemas because characters in textbooks invite children to identify with these characters (Lee, 2014). If male and female characters in textbooks are portrayed in different roles, this gendered information captured in the hidden curriculum becomes part of children's gender schemas. Then, these messages will be internalized, and affect children's gender identity and behavior (Evans & Davies, 2000; Lee, 2014). Experimental studies have confirmed that stereotypical portrayal in textbooks, and using masculine generics in math tests affect science performance positively for boys and negatively for girls (Good, 2010; Kricheli-Katz & Regev, 2020). Furthermore, using masculine generics in math tests has been shown to increase the feeling among women that 'science is for men' (Kricheli-Katz & Regev, 2020).

Previous studies have demonstrated numerical underrepresentation of female characters in language and math textbooks, both in industrial Western (Biemmi, 2015; Koster, 2020; Lee, 2014; Moser & Hannover, 2014; Táboas-Pais & Rey-Cao, 2012) and low-to-middle-income countries (Barton & Sakwa, 2012; İncikabı & Ulusoy, 2019; Islam & Asadullah, 2018; Ullah et al., 2017). Additionally, male characters are the main character of the story more often than female characters in Italian language textbooks (Biemmi, 2015), and take up more space by being referred to by their names and pronouns more frequently in Hongkong and Pakistani language textbooks (Lee, 2014; Ullah & Skelton, 2013). When female characters are consistently underrepresented, this sends the message that they are less important and interesting (Barton & Sakwa, 2012; Biemmi, 2015). This underrepresentation varies across subjects: in German and Dutch as second language textbooks, the proportions of male and female characters were almost balanced, whereas in math textbooks male characters outnumbered female characters (Koster, 2020; Moser & Hannover, 2014). This might reflect the fact that math is traditionally perceived to be a masculine subject, and language a feminine one (Chaffee et al., 2020; Moser & Hannover, 2014).

In addition to bias in numerical representation, studies have shown that male and female characters in textbooks are portrayed in stereotypical social and occupa-

tional roles (Evans & Davies, 2000; Kerkhoven, 2016). Female characters fulfill parental and household tasks more often than male characters in Italian, Greek, German, and Azad Jammu & Kashmir language textbooks (Biemmi, 2015; Gouvias & Alexopoulos, 2018; Moser & Hannover, 2014; Ullah et al., 2017), and in German and Slovakian math textbooks (Moser & Hannover, 2014; Osaďan et al., 2018). Male characters, in contrast, are overrepresented in occupational roles in, amongst others, Italian, Malaysian, Indonesian, Pakistani, Bangladeshi, and German language textbooks (Biemmi, 2015; Islam & Asadullah, 2018; Moser & Hannover, 2014).

Regarding types of occupational roles, male characters are portrayed in a wider range of professions in Greek, Australian, Singaporean, Turkish, and Dutch as second language textbooks (Gouvias & Alexopoulos, 2018; İncikabı & Ulusoy, 2019; Koster, 2020), and in positions of higher social-economic status compared to female characters in Greek and Dutch as second language textbooks (Gouvias & Alexopoulas, 2018; Koster, 2020). Further, male characters are more likely than female characters to occupy jobs in science in Nigerian math textbooks and international online science education material (Dele-Ajayi et al., 2020; Kerkhoven, 2016). In language textbooks, female characters are more often portrayed in professions in education and health care in Italian and Dutch as second language textbooks (Biemmi, 2015; Koster, 2020). A recent study concluded that only female characters are portrayed in gender-typed professions, whereas male characters appear in more varied professions in Dutch as second language textbooks (Koster, 2020). Kerkhoven et al. (2016) did not find gender differences in the frequencies of characters' experimental and science activities (technology, chemistry, astronomy activities) in international online science material for primary schools. To our knowledge, no studies have yet examined to what extent female characters are overrepresented in STEM professions (Science, Technology, Engineering, and Math), and to what extent male characters are underrepresented in EHW professions (Education Health, and, Welfare) in textbooks for young adolescents. Such biased representation in textbooks is important to investigate, as it may be one of the reasons that gender representation in these professional areas is often very stereotypically skewed.

There is also evidence of gender stereotypes in social-emotional character traits and behaviors among characters in U.S. and Italian language textbooks (Biemmi, 2015; Evans & Davies, 2000). Male characters are more often characterized by masculine traits, such as aggressive, argumentative, and competitive, whereas female characters are more often characterized as affectionate, passive, and tender. The distinction between submissive and disharmonious traits and behaviors (Chaplin et al., 2005; Van der Pol et al., 2015) is relevant here. Submissive traits (e.g., sadness and anxiety) are perceived as more feminine, do not threaten interpersonal interactions, and communicate personal vulnerability and the willingness to put someone's care above oneself. Disharmonious emotions (e.g., anger or joy at the expense of others) are perceived as more masculine, and are motivated by achieving one's own goals above those of others, potentially threatening interpersonal relations (Chaplin et al., 2005). This is in line with

the stereotypic expectation in industrialized Western countries for women to be more relationship-oriented than men, and for men to strive for dominance more than women (McIntyre & Edwards, 2009; Van der Pol et al., 2015). Gender differences in disharmonious or submissive traits and behaviors, are particularly interesting to examine, as these are most strongly related to children's problem behaviors. Disharmonious emotions are related to externalizing behaviors in boys/men, and submissive emotions are related to internalizing behaviors in girls/women (Berke et al., 2018; Guo et al., 2019; Johnson et al., 2017). To date, no studies have examined whether these negative social-emotional traits and behaviors of characters in textbooks are gendered.

Both gender and sexual orientation play an important role in people's gender identities (Pakuła et al., 2015). Research on the representation of LGBTQ+ individuals in textbooks is limited, and scholars have called for more research on how LGBTQ+ topics are treated in learning materials for developing young people (Koster, 2020). In previous studies on language textbooks in the U.K., the U.S., and Poland, all romantic feelings and relationships of characters were characterized as heterosexual (Deckman et al., 2018; Gray, 2013; Pakuła et al., 2015). The absence of sexual minorities implies that heterosexuality is the only normal and acceptable sexual orientation (Ruiz-Cecilia et al., 2021), and as such reflects an aspect of the hidden curriculum that can influence learners' expectations and feelings about their own sexual orientations.

Consistent with the theory of the hidden curriculum and the empirical literature, we test the following hypotheses: (H1) male characters are overrepresented in Dutch textbooks, in that they take up more space, are more often the main character of the story than female characters, and are more strongly overrepresented in math textbooks compared to textbooks for the Dutch language; (H2) roles inside the house are more often fulfilled by women, in that they are overrepresented in parental roles, and doing household tasks; (H3) occupational roles and technical tasks are more often embodied by male characters in that they are overrepresented in occupational roles, in occupations with a higher social-economic status, in STEM professions, and among characters doing technical tasks. Among characters with EHW professions, however, we expect female overrepresentation; (H4) social-emotional traits and behaviors are stereotypically attributed to male and female characters, in that males are overrepresented among characters expressing disharmonious traits and behaviors, whereas females are overrepresented among characters showing submissive traits and behaviors; (H5) sexual minorities are underrepresented in math and DFL textbooks.

Although gender messages in textbooks have been examined in several European countries, no such studies have yet been conducted in the Netherlands. Compared to other countries, gender equality in the Netherlands is relatively high. In 2020, it was ranked fifth in the European Union (EIGE, 2020). Regarding gendered segregation of occupational roles, however, the Netherlands score relatively low on gender equality. Segregation in STEM/EHW professions and tertiary education in the Netherlands are among the highest in Europe (EIGE, 2018; Salanauskaite, 2017). Within

this national context, it is of special relevance to examine differences in gender between language and math textbooks, and the extent to which both male and female characters are systematically presented in stereotypic occupational roles and activities. Based on the Dutch national profile, we expect that within this domain, we will find more gender bias compared to those found in other industrialized Western countries. Finally, given the relatively high acceptance of equal rights for sexual minorities in the Netherlands compared to other countries (Janssen & Scheepers, 2019; Sani & Quaranta, 2020), we expect to find less underrepresentation of these groups in Dutch textbooks compared to those in other industrialized Western countries.

We focused on textbooks for young adolescents, because early adolescence is a period of development during which children are particularly susceptible to stereotypic messages (Aronson & Good, 2002; Kågesten, 2016). Because the gap in science interest emerges around early adolescence, examining gender stereotypes in occupational roles and activities and tasks in early high school textbooks for math is especially relevant (Blue & Gann, 2016; Wonch Hill et al., 2017). In contrast to most previous studies, we examined all textbooks for the first year of secondary education for both math and (Dutch) language in a large number of textbooks, allowing us to examine the true extent of gender bias, and decreasing type I and II errors in the analyses (Islam & Asadullah, 2018).

3.2 Method

This study includes all mainstream (hard-copy) textbooks for the subjects math and Dutch language that were used in 2019 for the first year of secondary education in the Netherlands (entry at ca. age 12 years). We did not include textbooks that were specially designed for specific ideologies or religious affiliations, as previous studies demonstrated that these differ considerably from mainstream textbooks (Asadullah et al., 2019). All three relevant publishers (Malmberg, Noordhoff, ThiemeMeulenhoff) participated voluntarily in our study and made their materials freely available.

In total, we included 13 textbooks for language and 12 for math, covering all educational levels for the first grade of secondary education. In Table 3.1, a list of book series per publisher is presented. The total number of included textbooks per publisher varied between 4 and 10. Textbooks from the same publisher for the same level of education were coded together as one book (publishers often divide their books into two: parts A and B). Textbooks were coded from cover to cover: we analyzed all stories, pictures, information paragraphs, and all written exercises (for reading, writing, speaking, and listening). We focused on individual characters whose gender was discernable, which resulted in 7,347 characters for the language textbooks, and 4,591 characters for the math textbooks.

Table 3.1: List of Book Series per Publisher

Publisher	Book series Dutch language	Book series Math
Malmberg	Ta!ent Nederlands voor de onderbouw	Math Plus
Noordhoff	Nieuw Nederlands	- Getal en Ruimte - Moderne Wiskunde
ThiemeMeulenhoff	Nederlands op niveau	

Procedure

Initially, three researchers read through four textbooks, two from each subject, and developed an extensive coding system for gender, sexuality, and ethnic representation and stereotypes (the current paper focuses on gender and sexuality). Twenty social science (under) graduates were intensively trained in the coding system using selected pages from textbooks. A reliability set was constructed by randomly selecting 10% of pages from two randomly selected textbooks, one for each subject. In testing intercoder reliability or 'intercoder agreeableness,' we followed the guidelines for content analysis proposed by Hayes and Krippendorff (2007). We calculated Krippendorf's alpha to determine intercoder reliability or 'agreement' (Hayes & Krippenforff, 2007). After three training sessions, coding a reliability set, and a round of revision, eight students became reliable coders for the math textbooks, and ten became reliable coders for textbooks from both subjects. Due to longer stories, language textbooks were more complex to code. The textbooks were assigned randomly to the coders reliable for that subject. Questions were discussed and provided feedback to coders on a weekly basis.

Social roles, occupational roles, and socio-emotional traits and behaviors of the characters were (re)coded afterward, based on the activities the coded characters were engaged in, and the traits that were ascribed to them. Household chores and technical tasks were coded by three coders (first, second, and third author). Attributed disharmonious and submissive emotional traits and behaviors were coded by two coders (the first and fourth authors). Professions of characters were recoded into status scores, STEM and EHW professions based on national (CBS, 2014) and international databases (Ganzeboom, 2010).

Codings of concepts

All measured concepts were coded based on text representation and visual representation, except for attributed socio-emotional traits and behaviors. An overview of our coded concepts for text- and visual representation is presented in Table 3.2.

Table 3.2: Overview of Measurements of Concepts

Concepts	Text representation (non-pictorial)	Visual representation (pictures)
Representation		
Gender of the character	Names, pronouns, gender-specific terms	Clothing, hairstyle
Taking up space	Counting names and references to the character	Counting times depicted throughout the book
Main character	Most mentioned character, or from whose perspective the story is told	Center of attention
Social and occupational roles		
Parental roles	References	References from text to picture
Household tasks	Activities, references	Activities
Occupational roles	References, activities	Uniforms, activities
Technical activities	References, activities	Uniforms, activities
Attributed social-emotional traits and behaviors	Emotional state, expressions and feelings, and character traits	
Sexual minority representation	Romantic relationships, thoughts, feelings, identity expressions	Romantic relationships, thoughts, feelings

Gender of the characters

In the case of text, the gender of the character could be inferred from their names, pronouns, or other gender-specific terms (such as occupations with gendered labels in Dutch). For some professions, the Dutch language uses male generics and can refer to either men or women, such as 'agent' (police officer). Characters without identifiable gender were not included in the current analyses. In the case of pictures, gender could be inferred from the character's appearance.

Taking up space

We measured the extent to which characters in the textbooks take up space by counting how often they were mentioned by name and how often they were referred to (e.g., as 'she' or 'his'). In pictures, coders counted the number of times the same character was depicted throughout the book. The number of times characters were referred to varied between 1 and 307. In the example below, the words that were counted to determine how much characters take up space are bolded.

'***Anna*** *went to the cinema with* ***her*** *friends.* ***She*** *took off* ***her*** *coat and walked to the counter to buy* ***her*** *ticket. Together with* ***her*** *friends,* ***she*** *bought a massive box of popcorn'. Space score: 7*. In this example, the character Anna scored a 7 on the variable 'space'. The inter-coder reliability for this variable was high for coders that focused on math

textbooks (Krippendorff's α = .83), as well as for coders of Dutch language and math textbooks (α = .82).

Main characters

In stories with one character, this character was always coded as the main character. When stories had multiple characters, the character from whose perspective the story is being told or the character most mentioned was coded as the main character. The others were coded as side characters. When multiple characters contributed to the story in equal amounts, they were all coded as main characters. In pictures, characters were coded as the main character when they were the center of attention in comparison to the other people around them. Inter-coder reliability was high for both coders that only coded math textbooks (Krippendorff's α = .87), as for those that coded math and Dutch language textbooks (Krippendorff's α = .86)

Social and occupational roles

Parental roles included characters described or depicted as parents, grandparents, aunts, uncles, and other adult guardians. Household tasks included all chores in and around the house (e.g., Sam is vacuuming his room, Her mother is cooking dinner). Inter-coder reliability for household tasks was satisfactory (α = .75). We coded occupations in STEM ('He works as a physicist') or EHW fields (e.g., She teaches English in high school) based on national codes for occupational segments and domains (CBS, 2014). Occupational roles included all paid jobs. Fantasy positions (e.g., witch, wizard) were excluded. To determine the social-economic status of the occupations of the characters, we used ISEI (International Social and Economic Index) scores (Ganzeboom, 2010). Technical tasks and activities included a variety of activities (e.g., repairing a bike, building a fence). Inter-coder reliability for technical tasks was satisfactory (α = .75).

Attribution of socio-emotional traits and behaviors

To examine the attributed socio-emotional traits and behaviors of characters, we included the described emotional state of characters (i.e. She is angry), descriptions of feelings (i.e. He feels insecure), emotional expressions (i.e. She cries), descriptions of socio-emotional behavior (i.e. She threatens to punch her, He flees), and character traits with a clear link to negative submissive or disharmonious emotions (i.e. She is very insecure, He is a rude person). Inter-coder reliability was very high for both submissive traits and behaviors (α = .93) and disharmonious traits and behaviors (α = .83).

Representation of characters from sexual minorities

Sexual orientation was coded when two people were described or depicted in a romantic relationship (e.g., 'his girlfriend called him' or 'Mr. and Mrs. Smith'), or when one person had romantic thoughts or feelings about another person (e.g., Stan is in love with Fatima). Famous people whose sexual orientation is publicly known were scored

here as well (e.g., Taylor Swift is coded as heterosexual). We want to stress here that we of course cannot be certain that the way famous people identify themselves is in line with what the general public knows about them. As our focus is on adolescents' perception of the representation of sexual minorities, we focus on celebrities' public personas.

Plan of analysis

To test our hypotheses about representation, we carried out binominal tests (which compares proportions of populations with one another) per subject for all textbooks. These results are presented in Table 3.3, and Figures 3.1 and 3.2. Proportions per book to illustrate potential differences and similarities across books are available upon request (results are available upon request). To test our hypotheses regarding gender bias in being the main character of the story, social and occupational roles, and social-emotional traits and behavior, we compared the proportion of female or male characters within these roles with their total representation per subject. For the portrayal of characters in gender-stereotypic occupational domains, we compared their proportion in STEM and EHW domains with their overall proportion in occupational roles. This way, we examine the over-or underrepresentation of male and female characters within these specific roles while accounting for overall under- or overrepresentation. To examine representation of characters from sexual minorities, we compared their proportion with the proportion of people from sexual minorities in society. Estimates of the prevalence of people from sexual minorities vary. We use the estimate of The Netherlands Institute of Social Research, which is between 4 and 6% (van Beusekom & Kuyper 2018). For all proportion tests, we present the test proportion, the result proportion, and the *p*-value per hypothesis in Table 3.3.

For our two continuous variables (amount of space and social-economic status), we tested for normal distribution and homogeneous variances, separately for language and math textbooks. For taking up space, the absolute skewness (7.186) and kurtosis values (68.329) exceeded the recommended cut-offs for large datasets, that is 2.0 for skewness and 7.0 for kurtosis (Kim, 2013). For social-economic status, we found that the assumption of normal distribution of the sample was not violated (for Dutch language textbooks, skewness = -0.878, kurtosis = -0.180; for math textbooks, skewness = 0.558, kurtosis = -1.200). Yet, the assumption of homogeneity of variance was not satisfied for either subject (for the Dutch language, F (1487) = 17.604, $p < .001$; for math textbooks, F (584) = 14.013, $p < .001$). We, therefore, carried out Man Whitney U tests for both variables. In doing so, we compare the medians of male and female characters instead of the means, because in skewed distributions this statistic is more robust and less affected by any value that is too high or too low. The median refers to the midpoint of the distribution, i.e., the number that separates the scores in the higher half of the sample from the lower half. For reporting effect sizes of differences in social-economic status, we report Cohen's *r*.

Table 3.3: Overview of Results from Proportion Tests

Hypothesis	Language			Math		
	Test proportion	Result proportion	*p*-value	Test proportion	Result Proportion	*p*-value
1. a) Female characters are underrepresented	.50	.40	<.001	.50	.44	<.001
1. b) Female characters are underrepresented among main characters of the story	.40	.39	.347	N.A.	N.A.	N.A.
2. a) Female characters are overrepresented in parental roles	.40	.53	< .001	.44	.36	.081
b) Female characters are overrepresented in household tasks	.40	.53	< .001	.44	.56	< .001
3. a) Female characters are underrepresented in occupational roles	.40	.30	< .001	.44	.24	< .001
b) Female characters are underrepresented in STEM professions	.30	.10	< .001	.24	.14	< .01
c) Female characters are underrepresented in technical tasks	.40	.26	< .05	.44	.29	< .001
d) Female characters are overrepresented in EHW professions	.30	.40	< .05	.44	.45	< .010
4. a) Female characters are underrepresented among characters with disharmonious traits and behaviors	.40	.27	< .001	.50		
b) Female characters are overrepresented among characters expressing submissive emotions	.40	.43	.096	.44		

3.3 Results

First, we examined to what extent female characters are underrepresented across the two subjects. Results are presented in Table 3.1 and visualized in Figures 3.1 and 3.2. In Dutch language textbooks, female characters were significantly underrepresented (40%, $p < .001$). This female underrepresentation was significant in all language textbooks, and the proportion of female characters varied between 34% and 44% ($p < .05$). In math textbooks, female characters were only slightly but significantly underrepresented (44%, $p < .001$). This underrepresentation was significant in 9 out of the 12 math textbooks, and the proportion of female characters varied between 37% and 50% ($p < .05$). If representation had been random, we would expect some books to have more female characters and some more male characters. Yet, female characters were not overrepresented in any of the books, highlighting the consistency of the underrepresentation pattern. In contrast to our expectation, female characters were significantly more strongly underrepresented in Dutch language textbooks than in math textbooks ($p < .001$).

Second, we examined whether female characters take up less space and are underrepresented among the main characters of stories in Dutch language textbooks (see Table 3.3 and Figure 3.1). In contrast to our expectations, the medians for taking up space were identical for male and female characters ($Mdn = 2$). Female characters were also not significantly underrepresented among the main characters of the stories in language textbooks (39%, $p = .347$). This finding was consistent across all 13 language textbooks. Thus, the data partly support our first hypothesis that female characters are underrepresented in textbooks for both subjects.

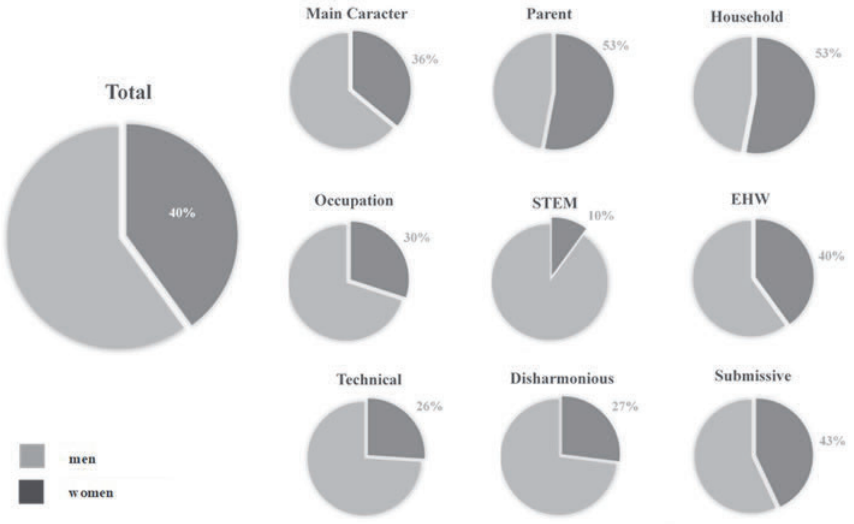

Figure 3.1: Proportion of Female Characters in Specific Roles and Activities in Language Textbooks (compared to overall proportion).

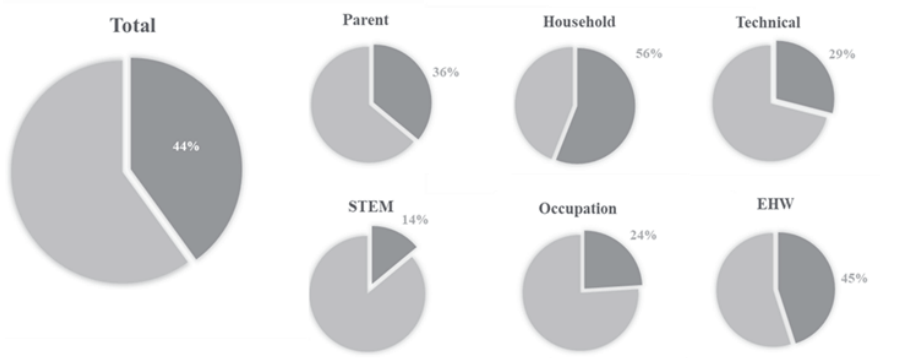

Figure 3.2: Proportion of Female Characters in Specific Roles and Activities In Math Textbooks (compared to overall proportion).

Third, regarding parental roles, we found that female characters were significantly overrepresented in language textbooks (53%, $p < .001$) (see Table 3.3 and Figures 3.1 and 3.2). This pattern was found in all 13 language textbooks. In math textbooks, female characters were not significantly overrepresented in parental roles (36%, p=.081). In 8 out of 12 textbooks, the proportion of characters in parental roles was, instead, larger for male characters. Female characters were significantly overrepresented in household tasks in language textbooks (53%, $p < .001$), a pattern found in 9 out of 13 language textbooks. Female characters were overrepresented in household tasks in math textbooks as well (56%, $p < .001$). This pattern was found in 10 out of 12 math textbooks. Thus, hypothesis 2 was confirmed for language textbooks, and partly for math textbooks.

Fourth, we examined whether occupational roles and technical tasks (e.g., Rachid is building a wall) were divided stereotypically across male and female characters (see Table 3.3 and Figures 3.1 and 3.2). Female characters were significantly underrepresented in occupational roles in language textbooks (30%, $p < .001$) (see Table 3.3). This pattern was consistent across all language textbooks. Also in math textbooks, female characters were significantly underrepresented in these roles (24%, $p < .001$). This pattern was consistent across all 12 math textbooks.

In contrast to our expectations, the social-economic status of female professions in language textbooks was significantly higher (Mdn = 72.83) compared to those of male characters (Mdn = 64.44), U (N_{female} = 454, N_{male}=1034) = 198623.5, z = -4.778, $p <$ .001). This pattern was found in 12 out of 13 textbooks. Yet, Cohen's r indicated that the effect size is very small (r = .015), meaning that only 1.5 percent of the variance in social-economic status was accounted for by gender. For math textbooks, however, the social-economic status of female characters was significantly lower (Mdn=28.48) compared to those of male characters (Mdn = 37.83), U (N_{female} = 133, N_{male} = 451) = 24821.5, z = -3.027, $p < .001$. This pattern was found in 7 out of 12 math textbooks.

Cohen's *r* indicated that this effect size was very small ($r = .016$). This means that only 1.6% of the variance in social-economic status was accounted for by gender.

In language textbooks, female characters were significantly underrepresented in STEM occupations (e.g., mathematician, physician) (10%, $p < .001$). This pattern was consistent across all of these 13 textbooks. In 6 of these, female characters in STEM were absent. Female characters were significantly underrepresented in STEM professions in math textbooks as well (14%, $p < .01$) (see Table 3.3 and Figure 3.2). This pattern was found in 11 out of 12 math textbooks. Furthermore, in three math textbooks, none of the STEM professionals were female. Concerning the division of EHW professions (e.g., teacher, babysitting), we found that female characters were significantly overrepresented in these occupations in language textbooks (40%, $p < .05$). A similar pattern was found in 11 out of 13 language textbooks. In math textbooks, too, female characters were significantly overrepresented in EHW professions (45%, $p < .01$) (see Table 3.3 and Figure 3.2). This finding was consistent among 10 out of 12 of these textbooks.

Regarding technical tasks, female characters were significantly underrepresented in language textbooks (26%, $p < .05$) and math textbooks (see Table 3.3 and Figure 3.1 and 3.2). For language, this finding was consistent among 7 out of 13 language textbooks. For math, in 11 out of 13 math textbooks a similar pattern was found. Thus, hypothesis 3 is partly confirmed by the data.

Fifth, we examined whether disharmonious and submissive traits and behaviors are stereotypically divided over male and female characters. Female characters were significantly underrepresented among characters with disharmonious traits and behaviors (27%, $p < .001$) (see Table 3.3 and Figure 3.1). This pattern was found in all 13 language textbooks. Among characters with submissive traits and behaviors, female characters were not significantly overrepresented (43%, $p = .097$). This means that hypothesis 4 is partly supported.

Finally, we examined whether characters from sexual minorities were underrepresented. In all books for both subjects, characters belonging to these groups were absent. As this underrepresentation is evident (0%), testing whether this percentage reflects the percentage of people from sexual minorities in the Dutch society (between 4 and 6%) was redundant. Therefore, hypothesis 5 is confirmed by the data.

3.4 Discussion

This study aimed to add to the literature on bias in gender and sexuality in textbooks by examining to what extent the theory of the hidden curriculum can be confirmed in a relatively gender-equal and sexual minority-accepting country like the Netherlands (EIGE, 2020; Janssen & Scheepers, 2019; Sani & Quaranta, 2020). Additionally, we examined whether social-emotional traits and behaviors are stereotypically attributed to male and female characters in the hidden curriculum. We found that female

characters are underrepresented in textbooks, especially in language textbooks. Yet, when represented, they are equally often the main character of the story and take up the same amount of space. Further, roles inside the house (parental roles, household tasks) are more often allocated to female characters, whereas female characters are underrepresented in occupational roles (especially in STEM), and among characters doing technical tasks, but overrepresented in EHW professions. Female professions have a lower social-economic status than male professions in math textbooks, but this pattern is reversed in language textbooks. Female characters are also underrepresented among characters with disharmonious traits and behaviors, but no gender effects in relation to submissive traits and behaviors. Finally, we found no characters from sexual minorities in any of the textbooks.

Regarding gender bias in representation, our results are consistent with the theory of the hidden curriculum and partly in line with previous studies. As in studies in other countries (Blumberg, 2008; İncikabı & Ulusoy, 2019; Islam & Asadullah, 2018; Lee, 2014), we found that female characters are underrepresented in language and math textbooks. However, in contrast to previous comparative studies on textbooks for elementary school (Moser & Hannover, 2013), we found a stronger female underrepresentation in language, instead of in math textbooks. This discrepancy could indicate that avoiding gender bias in representation for adolescents' language textbooks is more challenging for authors compared to those for young children, potentially due to the inclusion of longer stories in the first. Additionally, in contrast to previous studies (Biemmi, 2015; Lee, 2014; Ullah & Skelton, 2013), we did not find that female characters are less often the main character of the story or take up less space in language textbooks. Apparently, these types of underrepresentation of female characters are not present in Dutch language textbooks.

With respect to role division, we found that, in line with the theory of the hidden curriculum and previous empirical studies (Blumberg, 2008; İncikabı & Ulusoy, 2019; Moser & Hannover, 2014), female characters are overrepresented in household tasks in math and language textbooks. Furthermore, consistent with previous studies (Gouvias & Alexopoulos, 2018; Moser & Hannover, 2013), we found a female overrepresentation in parental roles for language textbooks, but not for math textbooks. This discrepancy might be explained by our focus on textbooks for secondary education, which include more complicated (technical) tasks (e.g., soldering a cube, laying laminate) that authors might unconsciously associate with fathers rather than mothers compared to the less complicated tasks in textbooks for primary education (e.g., adding up cooking time and grocery prices) (Couprie et al., 2020; Ullah et al., 2017).

Consistent with the theory of the hidden curriculum and results of previous studies (Koster, 2020; Moser & Hannover, 2014), we found that male characters are overrepresented in occupational roles. Further, the social-economic status of male characters in math textbooks is higher compared to those of female characters, but the reverse effect was present for language textbooks. We want to stress here that

the effect sizes for occupational status were very small (1.7% of the variance in social-economic status was accounted for by gender of the character). Additionally, in line with previous studies (Dele-Ajayi et al., 2020; Kerkhoven et al., 2016; Koster, 2020), we found that male characters are overrepresented in STEM, whereas female characters are overrepresented in the EHW professions. These findings reflect the relatively high segregation in occupational domains of men and women in the Netherlands (EIGE, 2018). In contrast to Kerkhoven et al. (2016), we found that male characters are over-represented in technical tasks. This could indicate that the stereotypical message that 'doing technical tasks is for men' is more prevalent in educational material that does not focus on these tasks. It should be acknowledged that, for characters in EHW professions in math textbooks and characters doing technical tasks in language textbooks, we relied on a small number of total characters.

In line with observation studies in families, we found that disharmonious traits and behaviors (e.g., being angry, behaving dominantly) are stereotypically ascribed to male characters (Chaplin et al., 2005; Van der Pol et al., 2015). Applying theories about emotion socialization in the family context to the hidden curriculum in textbooks has thus been proven of added value. In contrast to previous studies (Biemmie, 2015; Evans & Davies, 2000) we did not find female overrepresentation among characters expressing submissive emotions and social-emotional behavior. A cursory review of character descriptions showed that male characters seem to express these submissive behaviors more often in dangerous situations, in which their masculinity is less threatened (e.g., during a fight), compared to female characters, who express submissive emotions and social-emotional behavior outside of these situations (e.g., feeling insecure about themselves). Future qualitative studies should examine these potential differences in more depth.

As in previous studies in other countries (Deckman et al., 2018; Gray, 2013; Pakuła et al., 2015), we found that characters from sexual minorities are severely underrepresented, that is, they are entirely absent. This is especially notable given that no less than 11.938 characters were analyzed. The fact that in a country like the Netherlands, often praised for its relatively high acceptance of sexual minorities and rights (Janssen & Scheepers, 2019; Sani & Quaranta, 2020), these minorities are excluded from all textbooks for language and math is striking. However, in the Netherlands, publishing textbooks is subject to market-driven demand, with schools free to decide which books they require for their students. Schools with a strong religious signature are known to be unwilling to expose their students to LGBTQ+ themes (Maussen & Vermeulen, 2015). So publishers who wish to produce materials that are attractive to as many schools as possible to optimize profit, are likely to decide to exclude LGBTQ+ characters from their books.

Limitations and future research directions

There are some limitations of this study that should be acknowledged. First, this study was limited to textbooks, whereas online materials play an increasing role in education (Kerkhoven, 2016). Furthermore, adolescents are exposed to the selection of the study material made by their teachers and the (implicit) messages that their teachers provide during classroom discussions (Gouvias & Alexopoulos, 2018). Yet, as teachers and children still rely on textbooks as the major source for teaching and learning, textbook analyses remain relevant today (Gouvias & Alexopoulos, 2018; İncikabı & Ulusoy, 2019). Second, the quantitative nature of our study precludes in-depth insights into the substance of stereotyping, but does uniquely examine gender bias in domains that were previously only studied qualitatively, like occupational status, occupational domains, expressed emotions, and social-emotional behavior. This revealed that although explicit stereotypes are rare in these textbooks, implicit stereotypical messages are included (e.g., placing the majority of technical tasks with male characters).

Practice implications

Previous experimental studies found that stereotypes in textbooks can hamper individuals' intellectual development, and reduce their feelings of belonging to gender non-conform professions (Good et al., 2010; Kricheli Katz & Regav, 2020). Additionally, excluding characters from sexual minorities in textbooks sends the message that heterosexual relationships are the only 'normal' or acceptable relationships in society (Ruiz-Cecilia et al., 2021). Given the negative impacts of these biases on children, publishers and educators need to be informed about the stereotypical messages and heteronormativity in their textbooks, and critically evaluate them. Discussing the results of this study with the participating publishers made it clear that for some of them, heteronormativity was part of the intentionally included hidden curriculum. These publishers choose to comply with the wish of religious schools to exclude sexual minorities in their textbooks. However, this was not the case for all publishers, who noted that some of their other materials do include LGBTQ+ characters. In contrast, none of the publishers were aware of female underrepresentation or the gender stereotypic patterns in their textbooks, and none found these findings acceptable. These patterns, therefore, appeared to be part of the unintentionally included hidden curriculum. Overall, the results show that gender stereotypic patterns and heteronormativity in Dutch textbooks are hidden in plain sight: they are subtle but structurally present. Publishers and schools that want to be more inclusive and contribute to gender equality, could be more critical in their selection of stories and role models in their books.

3.5 Conclusion

We conclude that, in line with the theory of the hidden curriculum, even adolescents in a relatively gender-equal and sexual minority accepting country like the Netherlands, are exposed to stereotypical gender messages about social roles, occupational roles, social-emotional traits and behaviors, and heteronormativity in textbooks. In order to comply with Article 28 of the Convention on the Rights of the Child stating that education should help children fully develop their personalities, talents, and abilities, publishers and educators should consider increasing female and LGBTQ+ representation and reducing gender-stereotypical patterns. By doing so, the hidden curriculum can be utilized positively to challenge gender stereotypes and provide role models that go beyond restrictive normative boundaries.