Kindergarten Students' Receptiveness to Messages Conveyed by Counter-Stereotyping Picturebooks

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Abstract

The study explores kindergarten students' receptiveness to messages conveyed by counter-stereotyping picturebooks and the effect of a curriculum integrating counter-stereotyping picturebooks to children's approach of gender-associated stereotypes. A curriculum programme using specific themed picturebooks as a medium is implemented, focusing on gender-associated colours, toys, clothes, sports, occupations, and physical characteristics. To test the extent to which picturebooks' messages influence kindergarten students' gender associations, both the Experimental and the Control Group completed a semi-structured questionnaire before (baseline) and after the programme (Time 2). Results demonstrate significant changes in children's gender associations after the programme. Data indicate notable shifts in perceptions regarding gender-associated toys, appearance features and occupational roles. Discussion of findings asserts that picturebooks' counter-stereotypic messages influence kindergarten students in order to expand their gender associations and adopt counter-stereotypical gender perceptions. Hence, the need for integrating counter-stereotyping picturebooks into the preschool curriculum for approaching gender associations is highlighted.

Keywords: counter-stereotyping picturebooks; gender associations; kindergarten; curriculum programme

1. Introduction

The learned bases for gender differences are well-established in the first few years of life (Bem, 1983; Martin & Ruble, 2004). Babies and toddlers rapidly form ideas related to gender, influencing their choice of activities, exploration of interests, and pursuit of objectives (MacNaughton, 1996). Nonetheless, it has been observed that preschool children are often limited from recognizing or envisioning alternative possibilities beyond their existing gender-related knowledge (Bender Peterson & Lach, 1990).

According to Oskamp, Kaufman, and Atchison Wolterbeek (1996) socialization into expected gender roles is one of the most important lessons young children learn. For preschool-age children, an important source of such information is picturebooks written specifically for their age group. There is ample recent research for using children's books as indicators of dominant societal values about gender representations and roles (Adam & Harper, 2023; Filipović, 2018; Kalaitzi, 2024b; Kneeskern & Reeder, 2022; Nguyen, 2021; Rakhmawati et al., 2022). If children's literature displays stereotyped gender associations, it will present restricted role models for children and eventually shape their behaviour in stereotyped directions (Oskamp, Kaufman, & Atchison Wolterbeek, 1996). Such an assumption might raise the question *'Do picturebooks that convey messages contradicting gender stereotypes offer non restricted role models for children and challenge them to expand their behaviour in wide directions?'*

This paper presents a programme integrating counter-stereotyping picturebooks -as an extended part of the Greek Early Years Curriculum- in an early childhood classroom. The methodology primarily focuses on examining whether a curriculum programme integrating picturebooks which convey straightforward messages regarding gender-typed toys, activities, colours and physical appearance could affect kindergarten students' prior knowledge and understanding of gender-typed categories. The analysis of descriptive data reveals significant changes in children's perceptions on every item regarding characteristics of appearance, occupational roles, gender-typed toys and playing activities. Discussion raises questions on whether counter-stereotyping picturebooks could be integrated into the preschool education curriculum and the level of their influence on children's reflection of gender associations.

2. Literature Review

2.1 Gender Stereotypes' Effects on Preschool Children

Gender development is a critical part of the earliest and most important learning experiences of the young child. By the time girls and boys enter kindergarten, they exhibit gender preferences, such as choosing "girls' clothes" or "boys' clothes" and preferring "boys' toys" or "girls' toys", as a function of their own gender. By the time children are four they realize that the primary feminine role is housekeeping, while the primary masculine role is wage-earning (Bender Peterson & Lach, 1990).

Pomerleau et al. (1990) explored the emergence of gender differences in infancy by the quantity and types of toys, the colours and types of clothing. The results showed that both boys and girls have learned that specific objects and colours are appropriate for them, and for children of their own gender. The differences observed are strongly related to masculine and feminine activities and connections: pink versus blue, or dolls, fictional characters and furniture versus vehicles, tools and sports equipment are readily associated with female versus male genders. It was also observed that even though toddlers generally prefer medium and high activity toys, they choose same-sex over cross-sex toys. They concluded that the dissimilar environments could have an impact on the development of specific abilities, skills and behaviours, as well as preferential activities in children of older age.

Regarding the effects of gender attributions, Eccles, Jacobs, and Harold (1990) showed that children carry their parents' dissimilar perceptions of performance in gender stereotypic activities such as math and sports, and that these perceptual biases influence the children's own self-perceptions, skills, activities and job choices. A few years later, Bigler (1995) explored the extent to which the use of gender categories affects children's classification skill. She showed that the functional use of gender categories increased gender stereotyping, particularly among those children with less advanced classification skills.

In this direction, Bian, Leslie, and Cimpian (2017) showed more recently that stereotypes related with abilities and occupational activities are endorsed by, and influence the interests of, children as young as six years old. Their results revealed that girls at the age of six begin to avoid activities considered to be for smart children and that a significant number of children assimilate the idea that brilliance is a male quality at a young age. These findings suggest that gendered notions of brilliance –referred to as a stereotype- are acquired early and have an immediate effect on children by shaping their interests which is thus likely to narrow the range of careers they will one day contemplate. By corresponding to previous findings, Olsson and Martiny (2018) noted that counter-stereotypical role models may reduce gender stereotypes in children, especially girls, regarding future career choices. Furthermore, Jackson (2007) had earlier shown the role of early school readers in sense-making of gender, work and abilities underlying that children's exposure to pictures and images depicting gender associations influences their perceptions on their own abilities and prospects.

Another source that frames and defines gender possibilities appears to be picturebooks. Bender Peterson and Lach (1990) in reviewing picturebook gender stereotypes' prevalence and influence on children's cognitive and affective development, concluded that stereotyped portrayals may impair the development of positive self-concepts and induce negative attitudes toward the child's own developmental potential and toward that of other children. They may significantly alter the child's cognitive development, presenting them with a non-balanced view of the world. As Richardson (1986) had previously stated the messages conveyed by gender stereotypical books are conforming or reforming, not transforming ones for the young readers as they present inaccurate messages about social roles and behaviour and often emphasize either directly or indirectly the importance of maintaining traditional roles and behaviour patterns, rather than questioning or facilitating change of those traditional views.

2.2 Expanding Children's Perceptions of Gender Associations using Counter-Stereotyping Picturebooks in Kindergarten

Historically, books were by design shapers and influencers of the young. Today, they exert ever-increasing influence and power on preschoolers' gender development. Bender Peterson and Lach (1990) noted that picturebooks play a significant and pervasive part in early gender development because books are the primary vehicle for the presentation of prevailing cultural and societal values and social standards to the young child. Consequently, children's books have, for a very long time, defined society's prevailing standards of masculine and feminine role development. Bishop's (1990) oft-used metaphor of diversity book collections -featuring characters from and experiences of underrepresented groups- to offer readers hopeful images of unity across valued and recognized differences, highlights literature's potential as well to be used as a medium to approach children's social role associations.

Weitzman et al. (1974) relate to previous research by their earlier insights, that children's books are a vital force for influencing children to realize the accepted standards of right and wrong within the complexity of their gender. In addition, picturebooks provide children with role models and clear images that prescribe what they can and should be like when they grow up. Bender Peterson and Lach (1990) arguing to previous studies, also, asserted/supported that picturebooks

offer young children a macrocosmic resource through which they can discover worlds beyond their own life-space. The young child's sense of personal and gender significance is changed, influenced and connected to the world community through books written for them by adults.

Nguyen (2021) investigated how kindergarten children engage in critical discussions of anti-bias issues including gender stereotypes among other topics, using anti-bias picture books. The findings revealed that children could participate in thoughtful interactions during anti-bias read-aloud sessions and show their complex understanding of gender issues. Also, children display a variety of responses to the discussion questions and activities related to gender-themed picture books as most children had difficulties resisting gender stereotypes.

Similarly, and more recently, Kalaitzi 2024b investigated the approach of family diversity in kindergarten using picturebooks that present same-sex parenting families. In her discussion of findings, she highlights the use of picturebooks on approaching social matters, such as family and gender diversity, and she points to picturebooks as powerful teaching tools to shape attitudes and behaviours amongst early age children.

Over the past five decades, there has been an increase in the publication of more inclusive books featuring the issue of gender diversity (Daly, 2017). Adam and Harper (2023) in their cross-cultural study of frequently read picture books in early childhood classrooms, showed that a significant amount of picturebooks consider the nature of employment and social roles performed by characters, including activities as well as personality traits exhibited by the characters. Among other themes, characters' competence in terms with their gender is a recurring topic. These gender-bending narratives, where boys participate in traditionally feminine activities and, less frequently, girls explore more masculine pursuits, are prevalent in the genre (Malcom & Sheahan, 2019). Notably, male characters breaking gender stereotypes have been seen as more groundbreaking (Naidoo, 2012).

In Harper's framework of gender stereotypes in children's literature (Adam & Harper, 2023) picturebooks are divided into categories according to their representation of gender identities. Under the 'gender neutral' category, picturebooks with the following criteria are included: (a) characters who exhibit universal human emotions, attitudes, needs and experiences, (b) characters who demonstrate non-traditional gender values and accomplishments, (c) females and males constructed with traits and engaged in a variety of activities, roles and relationships that complicate traditional depictions of gender and disrupt previous representations of masculinity and femininity, (d) messages conveyed that open possibilities for readers' interpretation and increase readers' exposure and awareness of gender possibilities. The picturebooks selected for the purposes of this study meet all the above criteria. In particular, the characters exhibit universal emotions and needs, such as/like the need for inclusion despite their different attitudes and behaviours (i.e. 'Williams' doll', 'My shadow is pink'). The characters -either female or male- challenge masculine and feminine roles and activities (i.e. 'Princess Smartypants', 'Piggy book', 'Pink is for boys'). The messages conveyed by these picturebooks refer to expanded notions of gendered colours, clothes, toys, activities and characteristics of appearance.

2.3 Rational, Aim and Objectives of the Current Research

One of the thematic sections of the skills workshop programmes included in the Greek Institute of Educational Policy (IEP) (Curriculum for preschool education, 2022) is the one that focuses on sexual education. The action plan titled as 'The Rainbow is here, inside it hides treasure!!!' is the only one addressed to kindergarten students. Two of the programmes' expected learning outcomes refer to students' understanding of the concept of social gender and identification and eradication of stereotypical expressions. Therefore, the need to approach gender stereotypes has been already noted in the preschool education curriculum.

Through the last decades, there were several attempts to examine and challenge gender certainties, gender stereotypes and biases in early childhood (King et al., 2021; Mahadew & Hlalele, 2022), to explore the roles of explicit gender labels and gender-typed colors on preschool children's object preferences (Weisgram, Fulcher, & Dinella, 2014), to equip children to identify and respond to sexism in media and peer groups (Pahlke, Bigler, & Martin, 2014), to increase children's acceptance of other children's gender-stereotypic toy play and preferences (King et al., 2020; Spinner et al., 2021), to expand both genders' activity and career cognitions (Coyle & Liben, 2016; Goble et al., 2012; Olsson & Martiny, 2018; Sherman & Zurbriggen, 2014), to engage in gender inclusiveness by identifying exaggerated perceptions of differences between genders (Blakemore & Centers, 2005; Chung & Huang, 2021; Fabes, Martin, & Hanish, 2019). All this previous research shows the interest in focusing to counter-stereotyping practices to expand young children's perceptions that restrain them on specific aspects of life, like playing, activities and occupation choices.

The design of the present research is based on the fact that a key aspect of gender stereotypes is the exaggerated perception of differences between genders, and that typically measures of gender stereotypes involve distinguishing between genders and endorsing the idea that certain toys, activities, or personality traits are suitable for one gender rather than both (King et al., 2020). This is the reason why this paper focuses on a curriculum programme integrating counter-stereotyping picturebooks to explore representations of gender-typed colours, toys, clothes, activities, and appearance. The rationale

for choosing kindergarten students as a sample population is that children below six years of age experience a rapid increase in gender stereotype knowledge (Serbin & Sprafkin, 1986; Signorella, Bigler, & Liben, 1993) and have rigid definitions of how girls and boys should behave in terms of the activities they engage in and toys they should play with (Martin & Ruble, 2004). The rationale for using counter-stereotyping picturebooks as a medium to intervene to children's gender associations is because Greek preschool education curriculum includes no reference to picturebooks of any thematic topic, hence, it does not provide any methodological tool to cover such issues.

The research hypothesis was that if counter-stereotyping picturebooks convey messages which counter gender-typed features, kindergarten children might be influenced in their perceptions on certain gender-typed features and their perceptions might be expanded. The objectives formulated as research questions were the following:

RQ1: What are kindergarten students' gender-associations?

RQ2: What is the role of counter-stereotyping picturebooks in kindergarten students' portrayals of gender associations?

RQ3: To what extent a curriculum programme that integrates picturebooks that convey counter-stereotyping messages affect kindergarten children's gender associations?

3. Materials and Methods

3.1 Sample

Two public Greek kindergarten classrooms in Thessaloniki (Greece) were selected for sampling. The sample consisted of 30 mixed gender kindergarten students of typical development ranged between 4-6 years old. This age group was chosen knowing that, "although children internalize social constructions related to gender with related stereotypes in their family and/or educational living contexts from early childhood, they are also fully capable of deconstructing these models and developing different perceptions if stimulated in this direction" (Segatto & Dal Ben, 2019: 190). The sample was selected to satisfy all inclusive criteria: gender balance, small age range (to ensure a fixed developmental stage), typical development (no language deficiencies or impairments), and no previous exposure in the counter-stereotyping picturebooks used in the intervention, a criteria that could represent the broader population of preschool children attending the Greek preschool education curriculum that includes no reference to counter-stereotyping picturebooks to approach specific gender associations. Two groups were randomly differentiated. The 15 kindergarten students of the Experimental Group (E.G.) participated in the curriculum programme integrating counter-stereotyping picturebooks, and the other 15 kindergarten students of the Control Group (C.G.), functioned as a weighing tool for the evaluation of the collected data. Consent forms were acquired from the parents/legal guardians and information sheets were provided both to parents/legal guardians and school staff. All rights were reserved, and full anonymity was kept. This research was approved by the Ethics Board of the Aristotle University of Thessaloniki, Greece.

3.2 Data Collection Tool

The proposed research methodological framework is based on previous studies implemented by numerous researchers (Blaise, 2005; Goble et al., 2012; King et al., 2020; Segatto & Dal Ben, 2019; Spinner et al., 2021). The data collection tool consisted of a semi-structured questionnaire. Previous studies measuring kindergarten and primary students' perceptions on gender behaviours and colour choices (Weisgram, Fulcher, & Dinella, 2014), gendered toy stereotype endorsement and knowledge (Blakemore & Centers, 2005; King et al., 2020) and gender activities and occupations (Sherman & Zurbriggen, 2014), formed the basis for the context/components of the questionnaire. The questionnaire consisted of 6 questions (each question was administered twice -1 time for masculine gender and 1 time for feminine gender) addressing 6 categories: colours, toys, clothes, sports, occupations and appearance. For each category, a variety of default options -functioning as items- was provided. Each participant was asked to choose amongst 35 items. Score [0] addressed to the indicators not chosen, while score [1] addressed to the chosen indicators.

To clarify the variety of default choices, the questions and options are mentioned below:

- Q1: What colours are typically associated with boys and girls? Default answers: [Blue], [Black], [Green], [Pink], [Purple], [Red], [All the above options], [This can change]

- Q2: What type of clothing do boys and girls typically wear? Default answers: [Pants], [Shirt], [Dress], [All the above options], [This can change]

- Q3: What toys do boys play, and what games do girls play? Default answers: [Car], [Action Figure], [Doll], [Kitchen set], [All the above options], [This can change]

- Q4: Which sports do girls usually participate in, and which ones do boys participate in? Default answers: [Football], [Basketball], [Volleyball], [Dancing], [All the above options], [This can change]

- Q5: What professions do boys/girls usually pursue? Default answers: [Policeman], [Driver], [Doctor], [Teacher], [All the above options], [This can change]
- Q6: What is the hair length of a girl and a boy? Default answers: [Short hair], [Long hair], [All the above options], [This can change]

3.3 Curriculum Programme Integrating Counter-Stereotyping Picturebooks

The programme was based on framework from previous recent research (Kalaitzi, 2024b; King et al., 2020; Rakhmawati et al., 2022; Spinner et al., 2021) and included five school-weeks of activities (35 days in total) conducted by the researcher in collaboration with the classroom teacher. Each week's activities were formed to relate with a specific counter-stereotyping picturebook and aimed to focus on a specific gender stereotype.

Below, in Table 1, the layout of the curriculum programme integrating counter-stereotyping picturebooks including the selected picturebooks, the associated objectives regarding their conveyed messages, and the associated activities are described.

Table 1. Curriculum programme integrating counter-stereotyping picturebooks phases layout

Picturebook	Objectives	Weekly activities
William's doll by Charlotte Zolotowand (1972)	- To distinguish gender-typed toys. - To acknowledge that all toys can be played by both genders.	-Picturebook read aloud. Questions & answers on 'What is my favourite toy?'. - Two-entrance table depicting students' favourite toys and classroom's play corners. - Play-Pairs: students are divided into pairs matching with a peer with a different favoured toy. Each pair plays for an equal amount of time both toys in turns. - Given that every student tries their pair's toy, students refill the two-entrance table adding to or changing their new favourite toys (if any) and classroom's play corners (if any). - Questions & answers on 'What toys do I like to play with?', 'Do I have only one favourite toy, or do I have more?
Piggy book by Anthony Browneb (1986)	- To distinguish gender-typed occupations & activities - To acknowledge that all occupations & activities can be performed by both genders.	-Picturebook read aloud. Predictions on narrative's ending. - Open ended discussion on parents/ guardians' occupations. - Distinguish pictures depicting individuals performing various occupations (firefighter, doctor, teacher, cleaner, car mechanic, police officer, etc.) with their heads covered into female occupations and male occupations & justify their decisions. - Revealing of figures' heads. Discussion on misconceptions and relocating any photos (if necessary) - Discussion on the roles of women and men in the past compared to the changes seen today. - Drawing on the subject: 'What I want to be/become when I grow up'.
Pink is for boys by Robb Pearlman (2018)	- To distinguish gender-typed colours - To acknowledge that all colours can be used by both genders	-Picturebook read aloud without showing the pictures that reveal the protagonists' gender. - Predictions on two figures' gender according to the length of their hair. - Divided into two groups (boys and girls) they colour the protagonist figures with pink or blue acrylics based on their assumption of the figures' gender. - Revealing of the protagonist figures true gender (the long hair figure is the boy while the short hair figure is the girl) - Recolouring the figures in mixed groups with a variety of colors. - Drawing themselves using their favourite colours.
Princess Smartypants by Babette Cole (1986)	- To distinguish gender-typed sports & activities-hobbies - To acknowledge that all sports & activities-hobbies can be performed by both genders	-Picturebook read aloud without revealing the ending. Predictions on the protagonist's choice. - Open ended discussion on princesses/ princes' appearance, hobbies, and activities. - Displaying a clip from the animation movie 'Shrek' showcasing a different type of a princess and a prince. - Drawing of a princess or a prince of their choice attributing to them gender non-conforming appearance and hobbies. - Role playing of various fictional or movie heroes/heroines who display gender non-conforming behaviours (i.e. Brave, Shrek, Fiona, Bob SpongeBob, Mulan, etc.)
My shadow is pink by Scott Stuart (2020)	- To distinguish gender-typed clothing materials & accessories -To acknowledge that all kinds of clothing materials & accessories can be worn by both genders	- Watching the picturebook adaptation in YouTube [animation sans mots (no words)] - Open ended discussion on protagonist's feelings. -Picturebook read aloud – revealing of protagonist's feelings. - Hidden treasure hunt to find a variety accessories and clothing materials. - 'Dress up like your shadow': Disguising using clothing pieces and accessories of their choice. Present themselves in front of class. - Questions & answers on the subject: 'What makes you happy?', 'What color is your shadow?' - Drawing of their shadow attributing to it any colour, clothes, behaviour, occupation, appearance they choose.

All the activities included in the curriculum programme were designed to frame and support the messages conveyed by the picturebooks selected. Every objective and task were associated with a different picturebook and aimed to strengthen the reflection on fictional characters' behaviours, actions and choices regarding colours, clothes, toys and activities. The outcomes of the activities (e.g. drawings, group portraits, group artifacts) were not meant to be treated as data or to be included in the data analysis.

4. Results

This study was designed with the purpose of examining descriptive (numerical) data and present findings representing scores in items of colours, clothes, physical features (hair length), toys, sports and occupations chosen by kindergarten children. To test the effectiveness of the curriculum programme integrating counter-stereotyping picturebooks, both groups' performance on the semi-structured questionnaire was measured before (baseline) and after the programme (Time 2) (Vickers & Altman, 2001). One-way ANOVA was used to detect statistically significant differences between groups (Control and Experimental) and measures (pre and post-programme in each group).

4.1 Both Groups Choices on Gender Associations Pre-Programme (Baseline)

Data suggest that participants did not exhibit significant differences in gender-related colour and activity perceptions between control and experimental conditions at pre-programme. Similarly, no differences were found between C.G. and E.G. in the pre-programme phase regarding answering the item [All the above options] in all the questions. Moreover, data on the item [This can change] in initial answers between C.G. and E.G. for various gender-associated questions at pre-programme phase were also measured. The data indicates that all [This can change] items across both groups were not significantly different, as evidenced by high p-values ($p = 0.05$). The responses observed present small differences, and are consistent across C.G. and E.G., indicating that initial perceptions were relatively stable regardless of group.

4.2 Both Groups Choices on Gender Associations Post-Programme (Time 2)

Data indicate that baseline scores outcomes were affected after the curriculum programme integrating counter-stereotyping picturebooks. Significant differences are evident in a few key areas, suggesting that the programme influence had an impact on participants' perceptions. For colours associated with gender (Q1A_Blue, Black & Green and Q1B_Pink, Purple & Red), item [Black] showed a marginally significant difference ($p = 0.069$), with the C.G. (M = 0.6000) associating black colour more with boys than the E.G. did (M = 0.2667). Gender-associated clothing items Q2A_Pants & Shirt and Q2B_Dress showed marginal significance ($p = 0.072$), with the C.G. consistently rating these clothing items higher (M = 1.0000) compared to the E.G. (M = 0.8000), indicating a strong initial gender association in the C.G. Items related to toys, sports and occupations (Q3A_Car & Action figure, Q3B_Doll & Kitchen set, Q4A_Football & Basketball, Q4B_Volleyball & Dancing, Q5A_Policeman & Driver, Q5B_Doctor & Teacher) revealed mixed results. For instance, item [Kitchen set] had a significant difference ($p = 0.028$), with the C.G. associating it more with girls (M = 0.6667) compared to the E.G. (M = 0.2667). Item [Teacher] also showed a significant difference ($p = 0.009$), with the C.G. again showing a stronger gender association. The most significant differences were observed in Q6A_Short hair and Q6B_Long hair, with extremely low p-values ($p = 0.000$), indicating very strong differences between groups. The C.G. consistently rated both items [Short hair] and [Long hair] as gender-specific (M = 1.0000), whereas the E.G. showed less strong associations (Means of 0.3333 and 0.2667, respectively).

Significant differences were observed across almost all the [All the above options] items, with p-values indicating strong statistical significance. Regarding colour items, for Q1A_All the above options and Q1B_All the above options, the C.G. consistently had a mean of 0.0000, indicating no association, whereas the E.G. had a mean of 0.3333, showing a significant change ($p = 0.013$). This pattern was consistent across other categories. The results, also, indicated significant differences in the degree of the [This can change] item, between the two groups for most questions. Regarding colour items, for Q1A_This can change and Q1B_This can change, there were significant differences between C.G. and E.G. ($p = 0.000$), with the E.G. showing a much higher mean score (0.8667) compared to the C.G. (0.2667). This pattern suggests that the programme had a strong effect on changing participants' initial responses regarding colour associations with gender. The difference was even more pronounced regarding toys, for Q3A_This can change and Q3B_This can change, with the E.G. showing very high mean (0.9333) compared to the C.G. (M = 0.2000), and highly significant p-values ($p = 0.000$). This indicates a strong shift in gender-related perceptions for toys due to the programme implementation. However, only Q5B_This can change, regarding occupation items [Doctor] and [Teacher], being significant ($p = 0.009$), indicated that the E.G. had a greater mean in perception for some occupation items but not all. Figures 1 and 2 present charts showing deviations between both groups mean scores performance on [All the above] and [This can change] items across all questions at post-programme. The differences in performance on these two items show E.G.'s expanded and more flexible perceptions of gender associations after their participation in the programme.
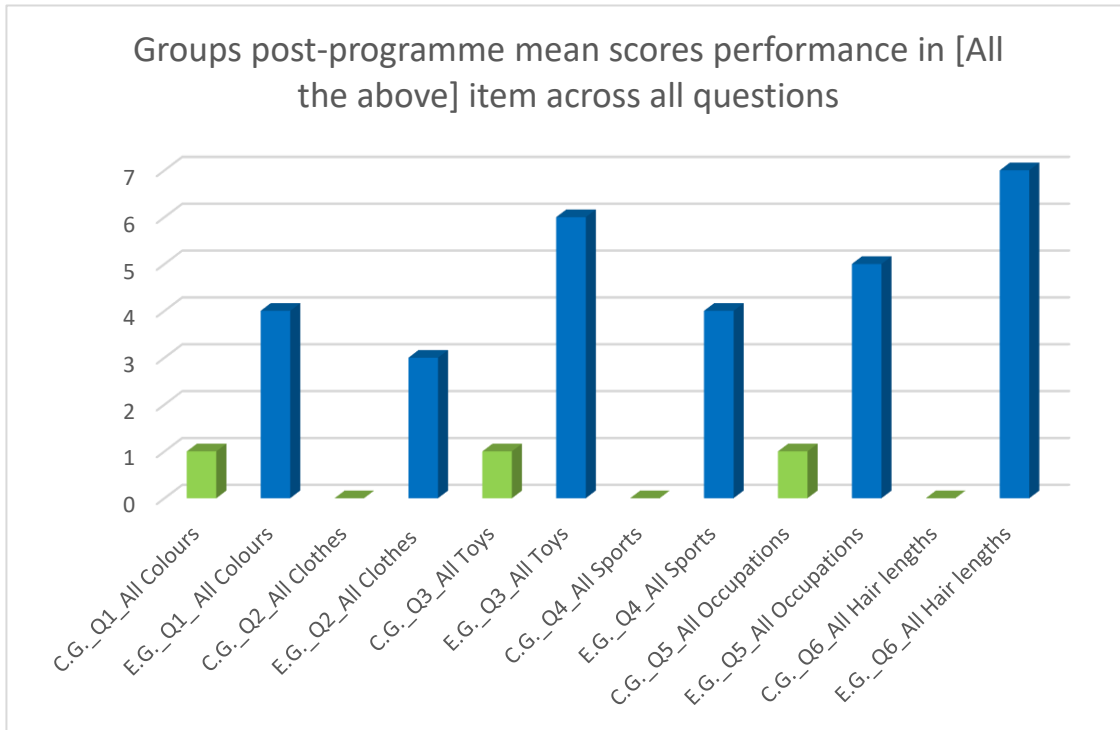
Figure 1. Chart showing deviations between groups mean scores performance in [All the above] item across all questions at post-programme
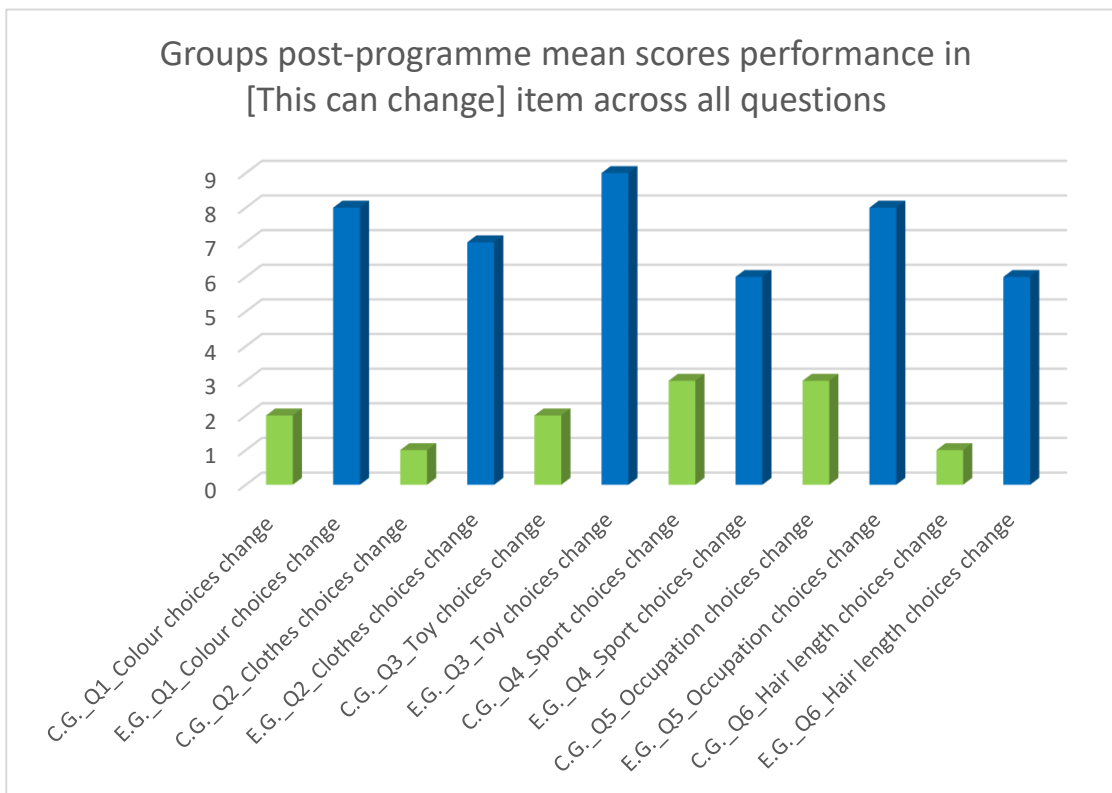

Figure 2. Chart showing deviations between groups mean scores performance in [This can change] item across all questions at post-programme

Furthermore, Table 2 shows the comparison of groups' performance in all items at pre and post-programme.

Table 2. Comparison of groups performance in all items at pre and post-programme

	Control Group VS Experimental Group		
	Question items	Item [All the above options]	Item [This can change]
Pre-programme	ND *(No Statistically Significant Differences)*	ND	ND
Post-programme	Significant differences in 4 items (Q3B_Kitchen set, Q5B_Teacher, Q6A_Short hair + Q6B_Long Hair)	Differences in all [All the above options] items (except Q2A_Pants & Shirt + Q2B_Dress)	Differences in all [This can change] items (except Q4A_Football & Basketball + Q4B_Volleyball & Dancing, Q5A_Policeman & Driver)

4.3 Experimental Group Performance: Pre-Programme (Baseline) vs. Post-Programme (Time 2)

Data on the mean responses for E.G. at pre- and post-programme conditions across various gender-associated items are worth noticing. The curriculum programme integrating counter-stereotyping picturebooks appears to have had a noticeable impact on participants' perceptions, as evidenced by significant changes in several items. For Q1A_Blue and Q1B_Pink, there were near-significant changes (p = 0.061), with mean responses dropping from 0.8000 pre-programme to 0.4667 post-programme. This suggests that participants were less likely to associate blue and pink colours with boys and girls, respectively, after the programme. In Q2A_Pants and Shirt and Q2B_Dress, the mean responses also decreased post-programme, with p-values of 0.072, approaching significance which indicates a shift towards more gender-neutral perceptions. Notably, Q5B_Teacher showed a significant decrease (p = 0.025) from 0.6000 to 0.2000, indicating that the curriculum programme significantly altered perceptions about teacher occupation's gender associations. Appearance items Q6A_Short hair and Q6B_Long hair displayed the most significant changes, with p-values of 0.000. The mean responses for [Short hair] and [Long hair] items dropped drastically from 1.0000 to 0.3333 and 0.2667, respectively, indicating a substantial shift towards more gender-neutral views on characteristics of appearance.

Results on the [All the above options] item, demonstrated significant changes in participants' perceptions on every item after the programme. The most dramatic changes were observed in occupation items (M = 0.4000, p-value of 0.005), and hair length items (M = 0.6667 and 0.7333, with highly significant p-values (0.000). These findings highlight the impact of the curriculum programme integrating counter-stereotyping picturebooks on shifting gender perceptions regarding characteristics of appearance and occupational roles. Data, also, highlighted significant changes in the [This can change] item, suggesting that the programme proved to be effective in making participants more flexible regarding gender associations. Q3A_This can change, regarding toy items [Car] and [Action figure], and Q3B_This can change, regarding toy items [Doll] and [Kitchen set], both experienced significant increases from 0.4667 to 0.9333, with p-values of 0.004, indicating strong shifts in perceptions regarding gender-typed toys and playing activities. Figures 3 and 4 present charts showing the differences between E.G.'s performance on [All the above] and [This can change] items across all questions at pre and post-programme. The differences in their performance show the extent to which kindergarten students' gender associations were affected during participation.
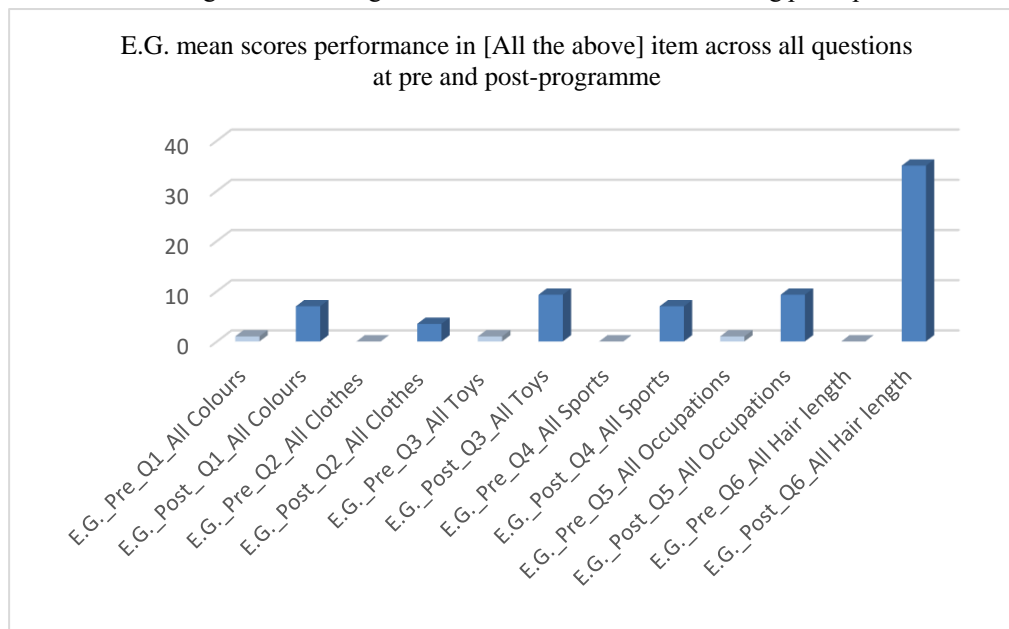

Figure 3. Chart showing differences between E.G.'s mean scores performance in [All the above] item across all questions at pre and post-programme
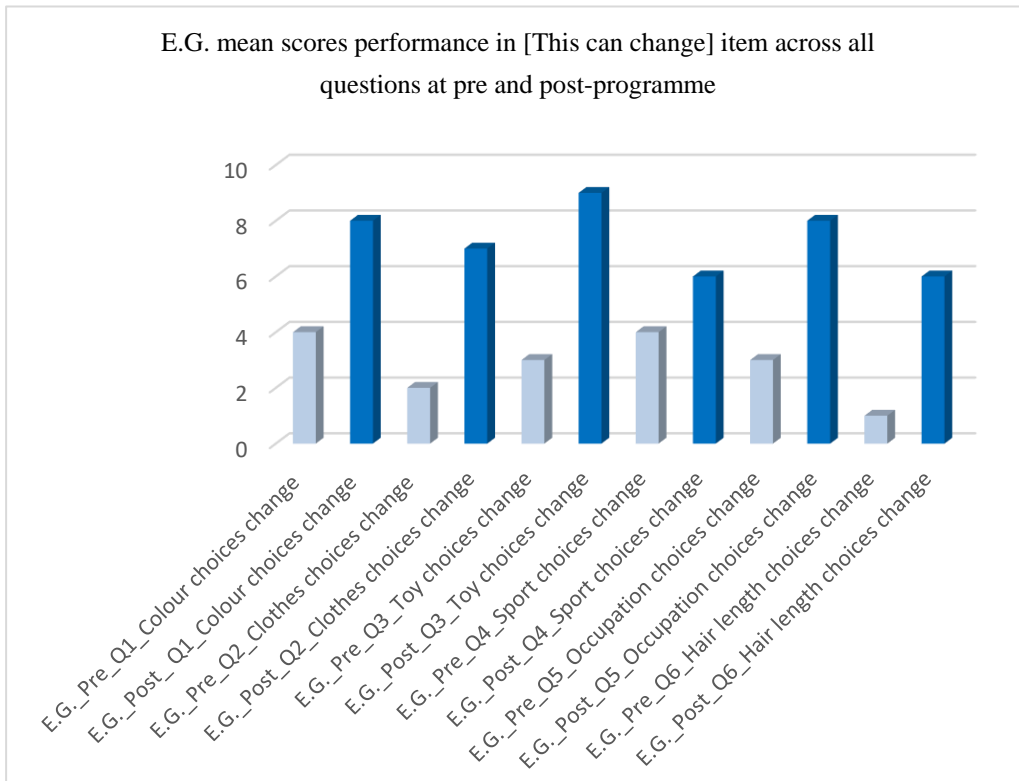
Figure 4. Chart showing differences between E.G.'s mean scores performance in [This can change] item across all questions at pre and post-programme

Based on qualitative data that may occur from taking field notes and audiotaping children's talk (Blaise, 2005), Table 3 presents children's responses and reflection on the messages conveyed by the counter-stereotyping picturebooks when interviewed by the researchers in the end of the curriculum programme's implementation.

Table 3. Children's responses and reflection on the messages conveyed by the counter-stereotyping picturebooks

Questions regarding the messages conveyed by the counter-stereotyping picturebooks	Children's responses and reflection *Children's names are coded with their initial letter of their Greek names and their gender*
Researcher: *'Are there some colours for boys and other colours for girls?' Why? Can you think of any examples?*	B_Boy: No, all colours are for everyone like the book says. E_Girl: Pink is for boys like the boy that had that shadow with the pink dress and others colours are for boys and for girls are green and other colours, like all children in the book. A_Girl: Boys and girls can use all colours. We saw that in the book that shows that all colours are for boys and girls. O_Boy: I like blue and green, but I like others colours too like the children in the pictures.
Researcher: *'Should children dress like the way they feel, or should they dress like the way the must to?' Why? Can you think of any examples?*	Φ_Girl: Princess Smartypants wears what she wants. I like Princess Smartypants. I want to wear whatever she wears. I_Boy: Everybody can wear what they want like the boy with the pink shadow. EΛ_Girl: I wear dresses with flowers and many colours like my mum does, but I can wear trousers like Princess Smartypants because I like princesses. And I like pink dresses like the boy with the shadow in the pictures. Θ_Boy: Boys wear pants but children must wear what they want like the boy in the story. And Princess Smartypants wore pants and she had a motorbike.
Researcher: *'What do you think about toys for girls and toys for boys?' Should children be able to play with all toys or not, and why? Can you think of any examples?*	A_Boy: All boys and girls can play together with the same toys because they are children and they want to play, like William wants to play with a doll. A_Girl: William is a good boy and the other boys must not make fun of him. It doesn't matter that William wants to play with a doll. Sometimes I want to play with my sisters' dolls too. Δ_Girl: All toys are for all children. Boys can play with dolls, like William and girls can play with dolls too and other toys like trains and balls. Π_Boy: Children can play with all toys because toys are for all children, like dolls and trains and basketballs in the story.
Researcher: *'Should girls and boys do only hobbies and activities suitable for them or not, and why? Can you think of any examples?*	MA_Girl: In the book with children and their shadows I saw that children can became whatever they want. I want to do basketball although I am a girl, because I like to play basketball. AX_Boy: Girls can have a motorbike like Princess Smartypants and boys can dance ballet like the boy who had a pink shadow. Π_Boy: I am doing football but my shadow can do dancing or cooking. AP_Girl: Everyone can have many hobbies and do whatever they want like the children with the shadows in the pictures. I like drawing but I want to do tae kwon do too, and it doesn't matter.
Researcher: *'Are there some chores and occupations for men and other chores and occupations for women? Should boys and girls do the same chores and occupations when they grow up, or not and why? Can you think of any examples?*	EΛ_Girl: In my house, my mum cooks and cleans and my dad feeds us and puts us to sleep. This is fair my mum says. But in the piggy story is not fair that the mother does all the chores in the house. Θ_Boy: All boys and girls must do all the chores because if only one does all the chores they will be very tired and sad, like Mrs. Piggott. Δ_Girl: I don't want to do all the chores because I am a girl, like the piggy mom did in the story. My mom says we should all help her with the chores. B_Boy: I help with the chores in my house. My dad and I do cooking sometimes and laundry, like Mr. Piggott and the piggy boys in the pictures.

5. Discussion

Pre-programme measurement confirmed previous findings that students of kindergarten age distinguish between genders and endorse the idea that certain toys, skills, personality traits, occupational activities and physical attributes are suitable for only one gender (Bender Peterson & Lach, 1990; Bian, Leslie, & Cimpian, 2017; Blakemore & Centers, 2005; Eccles, Jacobs, & Harold, 1990; Pomerleau et al., 1990; Sherman & Zurbriggen, 2014; Weisgram, Fulcher, & Dinella, 2014). Findings, after the analytic comparison of E.G. and C.G. performance at post-programme, confirmed the research hypothesis that children could be influenced due to their receptiveness to counterstereotyping messages conveyed by

picturebooks that challenge different kinds of gender associations. The most significant differences in children's answers show that their involvement in the curriculum programme affected them enough to expand their gender associations regarding some physical characteristics (e.g. hair length), some toys (e.g. kitchen set), and specific occupations (e.g. teacher).

Kindergarten students' persistence in gender stereotyping confirms previous studies on this age's rapid increase in gender stereotype knowledge and rigid definitions of how girls and boys should behave in terms of the activities they engage in and the toys they should play with (Blakemore & Centers, 2005; Serbin & Sprafkin, 1986; Signorella, Bigler, & Liben, 1993; Weisgram, Fulcher, & Dinella, 2014). However, E.G.'s performance on the [All the above] and [This can change] items showed that kindergarten students could be flexible toward their gender associations, confirming Segatto and Dal Ben (2019) that children can deconstruct embedded stereotyped role models and develop dissimilar perceptions if they are exposed to counterstereotyping situations.

A preliminary qualitative discussion of children's responses during their reflection on the programme shows that their beliefs and attitudes toward colours for boys and girls, dressing codes and appearance features for genders, toys associated only with girls or boys, activities suitable only for specific genders and chores that should be performed by only one gender, has been affected by the fictional characters choices, behaviors and actions. Children answered to the researcher's questions by addressing to either specific characters by their names, or by giving as example the message or the moral conveyed by the picturebooks to justify their responses. In accordance with Blaise (2005), further critical discourse analysis of children's talk would reveal even more in-depth information of their perceptions of masculinity and femininity and their flexibility towards gender associations. The influence on children's gender associated choices derived from a counterstereotyping medium, in this case the counter-stereotyping picturebooks, and aligns with previous studies noting that use of fiction in preschool age affects children's embedded beliefs, rigid sex-role portraits, and their self-image and aspirations towards gender possibilities (King et al., 2020; Kneeskern & Reeder, 2022; Rakhmawati et al., 2022; Weitzman et al., 1974).

The impact of the programme confirmed the need for curriculum approaching gender associations and challenge embedded gender associations that may restrict play, skills and career prospects in early childhood education (Coyle & Liben, 2016; Goble et al., 2012; Mahadew & Hlalele, 2022; Olsson & Martiny, 2018; Pahlke, Bigler, & Martin, 2014; Spinner et al., 2021). Since, picturebook that promote gender diversity and inclusiveness affect kindergarten students' gender associations, Greek preschool curriculum could be expanded by integrating picturebooks that contradict gender stereotypes on its approach of gender associations in that age (Chung & Huang, 2021; Fabes, Martin, & Hanish, 2019; Kalaitzi, 2024b; Kneeskern & Reeder, 2022)

The need for designing applicable curriculum programmes integrating counter-stereotyping picturebooks that offer a practical methodological framework regarding the approach of gender associations in early years, has been previously supported by Kalaitzi (2024a) on her study on factors that affect kindergarten teachers' use of picturebooks with gender non-conforming fictional characters. Findings showed that kindergarten teachers are mostly influenced by the lack of programmes integrating gender associated picturebooks in the Greek preschool curriculum, their own personal beliefs, and parents' attitudes on the matter of approaching gender issues in early childhood education. Hence, aligning with Kalaitzi (2024a), Oskamp, Kaufman, and Atchison Wolterbeek (1996) and Nguyen (2021), this study emphasizes the significance of providing kindergarten teachers with opportunities to engage with picturebooks and the gender models they portray, particularly those that promote gender diversity and inclusiveness, and evaluate the appropriateness of these tools for various age groups. Seminars, practical courses, and ongoing lifelong education –and, according to Timmons and Airton (2023), any form of professional guidance for gender-expansive practice– would acquaint professionals with curated lists of suitable books, to integrate gender discourses within the preschool curriculum's learning domains.

6. Limitations & Future Implications

The limitations of the present research can be identified regarding the sample and the validity and reliability parameters. Without doubt, a larger population could lead to safer and more objective measurements and comparisons. Additionally, the application of the intervention across different age groups (i.e. 1st, 3rd & 6th Grade) would have a greater impact offering a larger span and long-term effects for distinguishing children's gender associations and challenging stereotyped perceptions and attitudes. In parallel, for achieving a holistic evaluation of reliability on the evaluation tool by including multiple dimensions and criteria, a multi-level approach is recommended for future use. The exploration of teachers' experience and attitude towards the tool's content and the effectiveness of the intervention could be considered at a subsequent stage, whilst demographics of direct factors of gender socialization in early years (King et al., 2021), such as students' gender, gender of their siblings, age of their siblings, family composition, parents' occupations and student's cultural group can be included at a later stage (Frenzel, Pekrun, & Goetz 2007). Furthermore, another future extension of this study would be the data collection tool enhancement by a section addressing to several selected causes (i.e.

picturebook, fiction, animation, movie, series, advertisement, YouTube, etc.) added to the semi-structured questionnaire.

7. Conclusion

The conclusion of this paper might not seem as innovative regarding the outcome that picturebooks and related curriculum activities influence children's attitudes and beliefs. However, this study offers new perspectives regarding the integration of counter-stereotyping picturebooks in the Greek preschool curriculum and their use as a medium for expanding children's understanding of gender associations.

This study contributes to the early childhood field by suggesting that the integration of picturebooks that contradict gender stereotypes into the teaching approach of gender topics in early childhood education would increase kindergarten students' receptiveness and flexibility to reshape and reidentify gender perceptions. Understanding how children engage in messages conveyed by counter-stereotyping picturebooks might enable preschool educators to grasp the factors shaping gender associations and recognize children's active involvement in this process. By understanding these dynamics, educators could work towards a more gender inclusive teaching.

Competing interests

The author declares that she has no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Informed consent

Obtained.

Ethics approval

The Publication Ethics Committee of the Redfame Publishing.

The journal's policies adhere to the Core Practices established by the Committee on Publication Ethics (COPE).

Provenance and peer review

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Data availability statement

The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to privacy or ethical restrictions.

Data sharing statement

No additional data are available.

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