The Unintended Consequences Of The Things We Say: A Replication and Extension

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Abstract:

Past studies suggest that using generic language with children can cause unintended consequences such as social stereotypes. General statements made about groups communicate information about that group and unmentioned groups, leading children to make judgments about unmentioned categories. In order to test this theory and how external factors affect this hypothesis, Moty and Rhodes (2019) conducted three principle studies. Study 1 found that children as young as 4.5 years can make conclusions about unmentioned groups, Study 2 found that children will make these conclusions even when given little information, and Study 3 found that children are less likely to make conclusions when a knowledgeable speaker gives the statements (Moty and Rhodes, 2019). The present paper focuses on replicating the results from these studies and extending upon Study 3 by answering the question: "Does gender-specific language impact job prospects and gender-diversity, and does where they hear it from make a difference?" This replication was conducted through R and Binomial GEE Equations, while the extension was put into a literature review. Through this, we found that categorized/gendered language, achievement motivation, relationship with the speaker, and setting/context have significant impacts on how individuals view and shape career fields and positions.

Keywords: linguistics, social psychology, developmental psychology, generics, gender, heuristics, pragmatic, achievement motivation, parental relationships, digital media

Introduction

Generic statements that involve generalizing a population under certain descriptions such as “girls do not play sports” or “boys do not have stuffed animals” have wider effects on children than what is believed (Carlson, 1977; Carlson Pelletier, 1995). Generic statements play a large role in shaping childhood and impacting personalities, not just regarding gender, but also race, ethnicity, and other differentiating factors (Carlson, 1977; Carlson Pelletier, 1995). Around age four, children can start diving deeper into these statements by grouping people. For instance, in the statement: “boys like to play football”, children will start grouping by “boys” and what is not considered to be “boys” (Rhodes et al., 2018). This grouping advocates that there is something intrinsic about being a boy compared to the unmentioned groups (Cimpian & Erickson 2012; Cimpian & Markman, 2009; 2011; Gelman et al., 2010; Rhodes et al., 2012). Because of its phrasing, these descriptions communicate instead how the unmentioned and mentioned groups are supposed to act (Gelman, Goetz, Sarnecka, & Flukes, 2008; Graham, Nayer, & Gelman, 2011). Instead of assuming that this phrase is specific/applicable only to some individuals in the group rather than all members of the group, children tend to generalize it to the entire population and what is perceived to be a different group of those people. With this in mind, one must consider the idea and implications of how these statements affect the way that children perceive the world around them.

Since children’s reasoning does not act pragmatically, one must view the possibility of their misinterpretations to be dangerous. For instance, hearing “girls are good at baking”, how will a child perceive a new girl in their class? Will he or she assume she is good at baking? Will he or she assume a boy in the class is not skillful at it? Because of this, does making a statement dealing with absolutes communicate gender and social norms? (Gelman, et al., 2008; Graham, Nayer, & Gelman, 2011). These questions must be considered as one studies the impact that generic statements have on childrens’ cognitive reasoning towards themselves and their peers around them.

The possibility of generic claims conveying stereotypes can be traced to the question of the speaker's motivation for choosing such language (Grice; 1975; Clark, 1996; Horn, 1984). For instance, children may believe that the person speaking these statements may know a lot about the groups. Because of this, children may believe that knowledge provides justified belief on the claims made about both. This then leads to children attempting to interpret the meaning behind the person's decision to speak in that specific way (Jaswal & Neely, 2006; Koenig & Harris, 2005; Shafto, Goodman, & Frank 2012). The question children may consider is why would the speaker not instead word their statement as "boys and girls can be good at baking" or instead use general words such as "children" or "kids". Children may also think about the specific situation in which a speaker decided to make such a statement. If we take the baking example, if a teacher saw a specific girl excel at baking, he or she could make the statement "This girl is skilled..." instead of "girls are good at baking". Because of this, the decision to generalize the action to a group provokes children to then interpret it as an implication of gender behavior (Jaswal & Neely, 2006; Koenig & Harris, 2005; Shafto, Goodman, & Frank 2012).

This reasoning, called "pragmatic reasoning" or "pragmatic inferencing", can be a challenge for children. An example of this can be seen with a statement such as "Barbara only likes some sushi". Children before the age of seven can struggle to interpret the idea of Barbara liking "some" sushi and not "all" (Huang & Snedeker, 2009; examples with other quantifiers: Noveck, 2001; Papafragou & Musolino, 2003, etc.). This appears to be because children struggle to understand the difference in meaning between "some" and "all". Children find it challenging to consider the alternative words that speakers could have chosen (Barner, Brooks, & Bale, 2011). In simplified situations that either (a) do not need the alternative wording or meaning or (b) make it more understandable alternatives that could have been used towards schoolchildren (e.g., Stiller, Frank, & Goodman, 2015; Jara-Ettinger, Floyd, Huey, Tenenbaum, & Schulz, 2019). In contrast to these alternative words such as "all" or "some", schoolchildren are able to understand generic statements and can distinguish the difference between general and specific by the age two and a half (e.g., Graham, Gelman, & Clarke, 2016;

Graham et al., 2011). Therefore, Moty and Rhodes (2019) hypothesize that children draw their own conclusions and inferences about the intended meaning behind generic statements made by the speakers around them, and they conducted three separate studies to study this. The purpose of the work presented below was two-fold: (a) to identify what children may infer, if they do, about unmentioned groups from generic statements; and (b) to focus on the inferences of the unmentioned groups and how the inferences rely on the speaker's state. Study 1 examined whether people in fact extend generic statements to groups that are mentioned or unmentioned. Study 2dy 2 further examined whether children needed to hear a statement multiple times to develop these inferences about groups or if one time was enough. Study 3 tested whether children think more pragmatically or if heuristics are involved with their reasoning. For instance, if pragmatic thinking is involved, the children will only listen to these statements if a knowledgeable person is presenting it. This paper replicated Study 3. This study aims to shed light into how children use more nuanced social cues around them to make reasonings about certain prompts.

Original Study Methods

Participants

In this study, 181 children, ages 4 to 7.25 participated; half of these children were female, and the racial makeup of the participants were White (56%), Asian (20%), Black/African-American (7%), Middle Eastern or Northern African (3%), Mixed/Biracial (13%) and 22% of these participants identified as Hispanic/Latino. The children were recruited in New York City through local public preschools, elementary schools, and a children's museum. Eight children were excluded from this study for failing to complete the entire task (N=2), incorrectly responding to attention checks (N=5), or having technical difficulties (N=1).

For the control group, 65 adults with a mean age of 34.8 years participated. The racial/ethnic demographic information of the control group was not gathered, however, 22% of the adults were female. The adult participants were recruited via Amazon Mechanical Turk. One adult was excluded from this study for

incorrectly responding to attention checks.

Procedure

Three tasks - (1) a warm-up task, (2) a novel-category inference task, (3) a context-dependent pragmatic task - were performed and completed on a touchscreen by the participants. The context-dependent pragmatic ability task will not be discussed further in this paper as it was only included to make sure that animations on the screen (testing environment) could elicit pragmatic reasoning in children.

Novel-category inference task

Two phases make up this task. First, the learning phase, where half the participants learned about a special town that has only two kinds of people, zarpies and gorps, from a narrator who was a knowledgeable speaker (i.e. the narrator lived in the special town). The other half of the participants learned about this same town with zarpies and gorps from an unknowledgeable speaker (i.e. the narrator was visiting the town for the first time). Zarpies and gorps were separated into their respective groups by the color of their clothes (zarpies wore green and gorps wore yellow, group color was randomized). Despite the color of their clothes, members of both groups were diverse in terms of physical features, race/ethnicity, and gender.

The second phase of this task is the test phase. In four test trials, the narrator (regardless of knowledge status) introduced participants to a group of zarpies and gorps. Then the narrator directed the participants' attention to an individual shown on the screen doing a task (e.g. baking a pizza), and then introduced the property using a generic statement (e.g., “Zarpies are good at baking pizza”). Participants in both conditions had access to the same evidence (an individual zarpie baking a pizza), but what differed between the two conditions was the background knowledge about zarpies and gorps carried by the narrator. This background knowledge (i.e., whether it was the narrator's first time visiting the town) was emphasized halfway through the trials to remind the participants.

After the generic statements, the participants responded either yes or no to questions about

whether two individuals, one zarpie from a group of zarpies and one gorp from a group of gorps, also possessed the property that was assigned to their group (e.g., whether the zarpie/gorp was also good at baking pizzas). Whether the participant was asked about a zarpie or a gorp in the first question was randomized across trials, and the responses to the questions across the four trials were what were used in the analysis.

Replication

Five tasks using the R studio application were performed for replication. First, unneeded participants were dropped from attention tasks. The data set was then split into six different files, with binomial GEE regression models and plots created for each. The purpose of this replication was to run the same statistical tests used in the original Moty and Rhodes (2021) study with the raw data in order to replicate the original data analysis and improve data visualization.

First, the libraries Rmisc, tidyverse, here, geepack, lubridate, emmeans, lme4, interactions, cowplot, and ggpubr were installed into R studio in order to be able to run the necessary code. We then excluded participants who failed the attention check. To do this, four columns “attention_correct”, “winograd_correct”, “sound_correct”, and “manip_correct” were created in the imported data table from the original study. For each column, the data was filtered and tallied when the response for the attention check was correct. To filter the data, the attention checks were grouped by participant ID number and then the sum function was performed, which disregards N/A answers and sums the respective columns. The sum function was not performed for the sound attention check because there was only one check. Then the IDs of the children who did not pass both attention checks and the children who didn't pass the sound checks are filtered out using the filter functions. With this, the IDs of unneeded participants were removed, the columns that were previously created can be removed, and the separation of the correct data can now be split into six different data sets.

Working with only the test trials, the adult data, children’s data, and their respective answers to the questions during the study are split into different data frames to allow testing for inference to be performed.

Data frames are created depending on a participant's response to the questions asking for a “yes” or “no” answer in relation to a mentioned or unmentioned group. Additionally, a data frame is created that compares trial by trial whether a participant responded “yes” for a mentioned group and “no” for an unmentioned group. These data frames are split up between the children’s data, which is used for analysis when age is treated continuously, and adult data, which is useful for plotting categorical age in later steps.

Then the binomial regression models using GEE equations are performed in RStudio. The functions include “Pidi3_binomial_gee.R”, “Pidi3_binomial_gee_inf.R”, “Pidi3_binomial_gee_child.R”, and “Pidi3_binomial_gee_inf_child.R” and they analyze how response depends on the listed conditions. The first one, “Pidi3_binomial_gee.R”, is a binomial test model that analyzes how response depends on listed conditions. “Pidi3_binomial_gee_inf.R” is a binomial inference model that analyzes how response depends on listed conditions. “Pidi3_binomial_gee_child.R” is a binomial test model that analyzes how response depends on listed conditions only for the children’s data. “Pidi3_binomial_gee_inf_child.R” is a binomial inference model that analyzes how response depends on listed conditions (also only for the children’s data). Across all four age groups, children and adults were more likely to infer that the target property was not true of individuals from the unmentioned group after hearing generic statements from a knowledgeable speaker as opposed to when they heard the exact same generic statement made by an unknowledgeable speaker. These regression models showed that children and adults were more likely to extend the target property to members of the previously mentioned group than the unmentioned group ($p < .001$), this depended on the speaker’s knowledge of the two groups ($p < .001$), and across all age groups, participants were more likely to infer after hearing generic statements from a knowledgeable speaker that the target property was untrue of individuals from the unmentioned group compared with when they heard the exact same generic statement made by an unknowledgeable speaker (4-year-olds: $p = .004$; 5-year-olds: $p = .003$; 6-year-olds: $p < .001$; adults: $p < .001$).

Results of Replication

The replication analysis primarily focused on creating plots and graphs to represent the data and its findings.

First, binomial Gee equations were used in conjunction with multiple packages in R to find the probability of participants linking a mentioned trait to another member of the mentioned group, and the converse probability of participants linking target properties to a member of the other group (after being exposed to a mentioned trait of a specific group by either a knowledgeable or unknowledgeable speaker). Binomial Gee models were used since they can analyze all the effects of binary data- both within and between.

Second, the ggplot function was used to create two separate linear regression models. The relationship between participants' age (x-axis) and the proportion of trials where participants extended target property (y-axis) were plotted and then separated between one for the group with a knowledgeable narrator and one for the group with an unknowledgeable narrator. The linear relationship between the previously mentioned group and the linear relationship between the unmentioned group were identified by the colors yellow and green, respectively. The responses were summarized by mean and standard deviation, giving four variables. Because the variables were different for each condition, the standard error was taken separately for all four variables. Then the group means and group standard errors were put into the plots. The respective error bars and bands reflect the confidence interval of 95%.

After, both of these linear regression models were fed into Johnson-Neyman plots to show the slopes of condition predicting participants' extension of the target property with functions being age and group membership. The point of this graph was to show the age at which property extension (in relation to the mentioned and unmentioned groups) became significantly different. Property extension for the unmentioned group regardless of knowledge status was marked by a dashed vertical line, and there was no significant difference in the rate of property extension for the mentioned group, so no age was marked as significant**.**

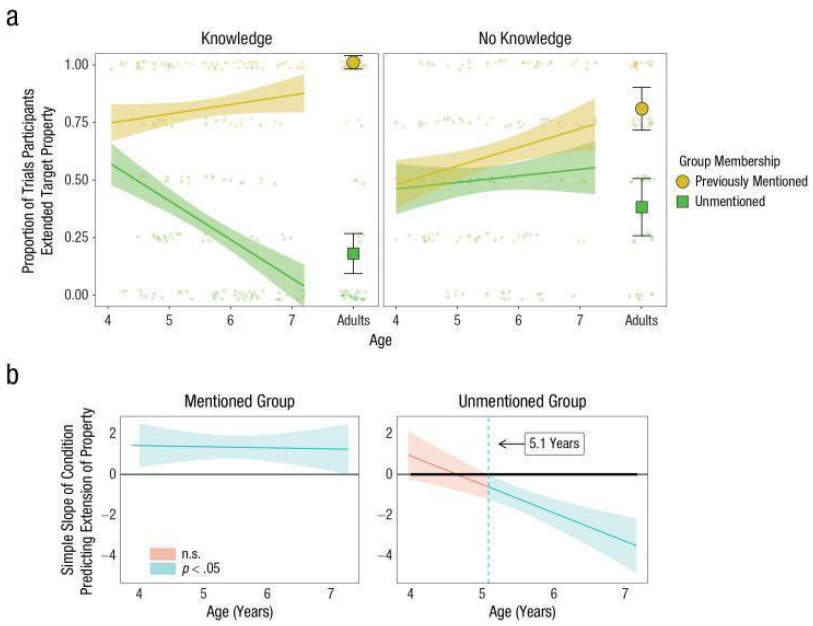

Figure A: Relationship Between Age and Property Extension

Two plots demonstrate the property extension as a function of age. The age at which property extension to the unmentioned group became significantly different is marked by the dashed vertical line.

Figure B: Relationship Between Age and Property Extension

Two scatter plots depict how the speaker's knowledgeability impacts how children extend the target property. The more knowledgeable the speaker, the less the target property is extended to the unmentioned group.

To represent data for property inference, a similar ggplot function was created to represent the proportion of trials in which participants made the expected inference (a participant responded "yes" that an individual of the mentioned group had the target property but "no" that an individual of the unmentioned group did not) in relation to age. The yellow regression line represented the group with the knowledgeable narrator and the darker green regression line represented the group with the unknowledgeable narrator. Then, like the first two regression plots, this regression model was fed into a Johnson-Neyman plot to show the difference in slopes between knowledgeable and unknowledgeable speaker conditions in relation to age. The age

where the inference rate across conditions becomes significantly different is also marked by a dashed vertical line.

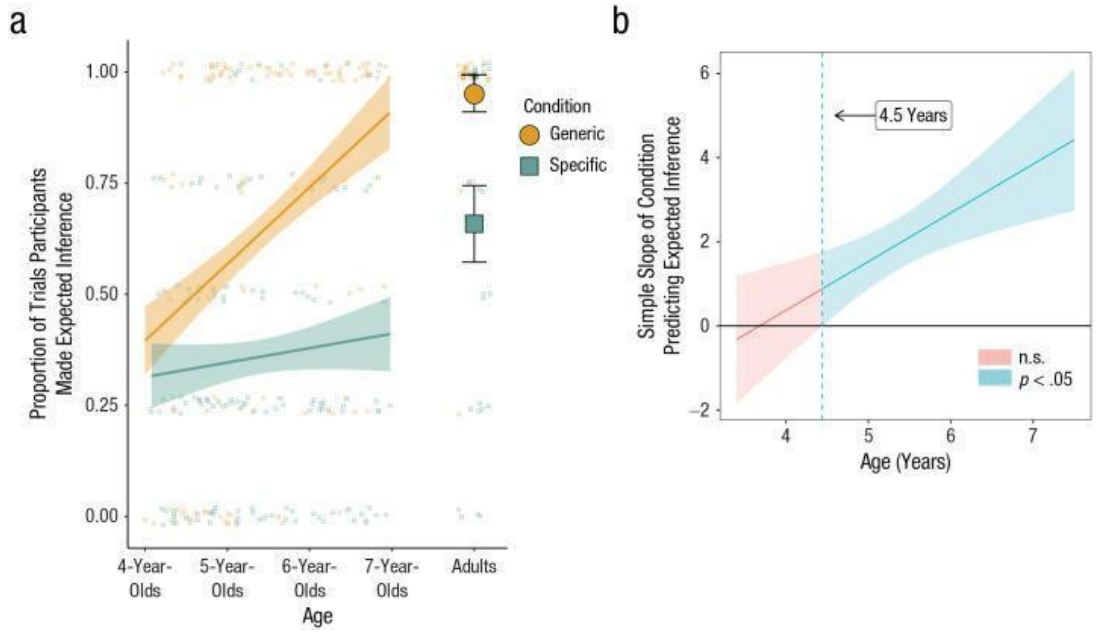

Figure A: Proportion of Trials Participants Made Expected Inference

The relationship between age and condition is demonstrated by the percentage of attempts in which participants correctly inferred as expected, according to the criteria of answering "yes" to whether a person in the specified group had the intended trait, but "no" to whether a person in the unspecified group did not possess it.

Figure B: Simple Slope of Condition Predicting Expected Inference

The line reflects a difference in slopes between knowledgeable and knowledgeable speaker conditions across age. The rate at which making inferences across conditions became significantly different is marked by the dashed vertical line.

Extension

1. **Intro:**

This paper serves as an extension of the original work conducted by Kelsey Moty and Marjorie Rhodes titled "The Unintended Consequences Of The Things We Say." While the initial article provided valuable insights into the impacts of generic statements on children's assumptions, our objective is to delve further into the study of language and generic statements and explore its implications within the classroom setting. Our primary focus is to investigate how generic, categorized statements, with a particular emphasis on gendered language, can influence children's achievement motivation and shape their self-perception of success and job prospects in society from an early age. By examining these effects, we aim to contribute to a deeper understanding of the role of language in shaping children's development and outcomes. To conduct a comprehensive literature review, we performed a systematic search of online databases that index research abstracts using relevant search terms such as "gendered language," "achievement motivation," and "speaker relationships." The selection criteria for inclusion or exclusion of studies in our analysis were based on whether they addressed the topics of gendered language, achievement motivation, speaker relationship, or the type of setting. We limited our analysis to include only peer-reviewed empirical studies with reliable results. After screening a substantial number of studies, we identified a total of 35 studies that met our selection criteria.

2. Categorized/Gendered Language

The way we perceive the world is heavily influenced by the language we use to describe it. The structure of gendered language can influence our perception of gender and the notion of gender roles, creating stereotypes and generics in the minds of adults and children alike. In the following section, we discuss how gendered language and other types of language alter generic statements, as well as its extended effects on adults and children.

Languages can be categorized into three categories: gendered languages, genderless languages, and natural languages. Gendered languages such as Spanish, French, and many euro-centric languages apply gender

to nouns and pronouns, while genderless languages such as Hungarian and Mandarin have no marked distinction in language. Natural gender languages are languages with gendered pronouns but genderless nouns, such as English. Out of these types, multiple studies have shown that gendered languages curate a strong association between a gendered word and its associated gender. In Sera et al. (2002), speakers of Italian (a gendered language) were presented with an image of a book (a masculine noun in Italian). Participants were then asked to describe whether they felt the object would have a male or female voice, when voiced in a children's cartoon. The majority of participants, when presented with the word, chose a male voice; this similar pairing of gendered words with the same gendered voice was found all through the study. Essentially, gendered language's structure inherently extends masculine or feminine associations to all words in the language.

With this in mind, further research was conducted on how this effect influences the way gendered language speakers perceive gender in the workforce in comparison to natural or non gendered language speakers. Bigler and Leaper (2015) examined whether gendered language in job advertisements would deter certain genders from career paths. Five different groups of randomized students as well as others were sampled to view online job advertisements and decipher aspects of the advertisement relating to gender. The first two were told to decipher between the use of masculine and feminine words, the second two were instructed to create female and male-dominated job advertisements and to approximate the gender diversity in each, and the last were given the task to estimate the effects of gendered wording on a variety of attributes essential for the workforce (Bigler and Leaper, 2015). The results of this study showed that gendered language plays a significant role in women's sense of belonging and interest in certain careers. Gendered language in the workforce perpetuates gender inequality in male-dominated fields and leaves women at a disadvantage in certain careers even if they were rightfully selected for the job.

As gendered language affects adults, it holds the same, if not, similar repercussions for children who hear categorized language. Current research displays a variety of situations in which gendered language can shape a

child's perception of the world around them. In 2002, a study was conducted with 64 children (34 being male, 30 being female) ranging from ages 6-8 (Liben, L. S., Bigler, R. S., & Krogh, H. R. (2002). The study conducted two experiments (1) establishing a child's understanding of occupation and sex of the worker and whether it is okay to apply a label and (2) examining their idea of the occupation by having them explain the job (Liben, L. S., Bigler, R. S., & Krogh, H. R. (2002). Although the study cannot firmly conclude a cause-and-effect with gendered language, there is some evidence to prove that there is gender association with occupational titles. For instance, 40% of the time, women workers were chosen when weak, masculine suffix titles were being used (Liben, L. S., Bigler, R. S., & Krogh, H. R. (2002). Because of the data, it emphasizes the importance for children to visually see a role model for both sexes for occupational roles while teaching children the irrelevance of gender when choosing an occupation. From this study, the findings promote that further development of gendered language is necessary to understand the psychological effect on children and stereotyping. Similarly, another study conducted in Porrentruy took 222 students and presented 15 occupations (5 male dominated, 5 female dominated, and 5 gender neutral) and half were masculine only form while the other was in a pair form (Vervecken, Gygax, Gabriel, Guillod, Hannover (2015)). Results from this study described an association between the language used (masculine only or the pair form) by showing that when using the pair form, success was seen as equal compared to using the masculine only form (Vervecken, Gygax, Gabriel, Guillod, Hannover (2015). The findings of this study are also consistent with previous studies that by using a masculine only form may affect a child's perception towards gender stereotypes (Blaubergs, 1980; Parks and Robertson, 1998; Bußmann and Hellinger, 2003; Mucchi-Faina, 2005; Koeser and Sczesny, 2014; Kuhn and Gabriel, 2014). While these findings support that gendered language can affect children's perceptions of occupations, there is also support that it also affects their future job decisions, as well (Gaucher, Friesen, Kay (2011)).

3. **Achievement Motivation**

Achievement motivation refers to the desire or drive to excel, accomplish goals, and succeed in tasks or

activities and it has been found to relate to gendered language. It is the internal motivational force that drives individuals to work hard, persist, and take risks to achieve desired outcomes or attain a high level of performance. In academic settings, achievement motivation is considered an important factor that influences students' academic success, engagement, and learning outcomes. Achievement motivation is also relevant in other domains, such as sports, work, and personal life, where individuals strive to achieve specific goals or standards of excellence(Shekhar (2012)). Achievement motivation is highly variable among different individuals and is heavily dependent on the environment in which said individual resides. The use of gendered language towards children especially impacts achievement motivation and can form associations that carry well into adulthood. One particular study aimed to investigate the impact of generic language ability on children's sustained involvement and success by analyzing their reactions when told to perform a novel activity. It was found that children are less motivated while performing a novel activity if they were told that boys or girls in general are good at this activity (generic language) than if they were told that a particular boy or girl is good at it (non-generic language) (Cimpian (2010)). Generic language may be detrimental because it expresses normative societal expectations regarding performance, which can cause worries about confirming or failing to meet them. The study highlights that exposure to generic language about ability can be an obstacle to children's motivation and potentially their success. Another study, involving achievement motivation across gender and different academic majors, highlighting different environments, and in particular, gendered language, investigated the relationship between gender and academic major with achievement motivation among undergraduate students from the Jammu region (Shekhar, 2012). The research sample consists of 80 students (40 males and 40 females) from various colleges, and Achievement Motivation Scale was used to select the subjects based on gender and academic majors. The t-test was used to obtain the results, which indicate a significant difference between the achievement motivation of science and arts stream students and male and female students (Shekhar (2012)). The paper emphasizes the importance of achievement motivation for student success in academic settings and other

areas such as sports and job-related situations. The study also discusses the influence of personality traits, developmental levels, and gender differences on achievement motivation. The paper highlights the role of motivation in explaining sex differences in school attainment and suggests that motivational models could improve learning and achievement processes (Shekhar, 2012). Taken together, both studies draw attention to how gendered language and the use of different language toward different groups of people impacts how they approach different problems and the motivation they feel to achieve some goal. Especially for children, using gendered language creates strong associations about their relationship and potential with the world around them, ultimately affecting their perspective on what they believe they can achieve.

4. Relationship with speaker

Because the Moty & Rhodes (2021) study shows that the speaker's knowledge of the subject in a generic statement is increasingly important to the belief in the generic statement, it is important to assess how relationship to the speaker plays a role in generic statements and the effects of these statements. One of the most important relationships to focus on for this issue is the child-parent relationship, for the childhood experience is significantly dependent on the relationship a child has with their parents (Randall, 2018). Young children rely on primary caretakers such as parents for safety, protection, and healthy development. Because of this relationship where parents are in charge of the safety and well-being of their children, children are prompted to trust their parents, making parents knowledgeable speakers (Breiner, H., et al., 2016). Thus, the generic statements that parents say (such as "fireman") may have an effect on achievement motivation in children (female children may not want to become firefighters because the generic statement "fireman" implies that only men can do it). Studies on school motivation and engagement show that parental achievement behaviors and beliefs in regards to school achievement have a profound influence on how children perceive their own behaviors and beliefs on the values of learning and education (Wang & Eccles, 2013). This means parental beliefs about achievement, expressed in both their actions and speech, can have a huge impact on children and their own

beliefs on the same topics, showing that it is very possible that parental generic statements may affect motivation. Additionally, it has been proven that when children are given generic statement feedback this decreases their motivation, and if this feedback is given especially by someone trusted, like a parent, it could have a significant decrease in the child's motivation (Chiviacowsky & Drews, 2014). It is important to address that the "quality of parent-child relations" can have also have an impact on the effect parents have on the motivation and engagement of their children, for not all children have full trust in their parents, so if a parent has not been credible in the past, children have a lower chance of being affected by their speech, lowering their chances of their motivation being affected by their parents generic statements (Breiner, H., et al., 2016; Jaswal & Neely, 2006).

The second most important relationship where generic statements could affect achievement motivation is the teacher-student relationship. The statement that feedback given in generics can decrease motivation also extends to the teacher-student relationship, for teachers are constantly giving feedback to their students, and the prevalence of generic statements could cause students to have decreased motivation on what they received feedback on (Chiviacowsky & Drews, 2014). This could lead to decreased performance in school, low self esteem, and ultimately affect achievement motivation in the long run. Research has shown that "others perceptions, definitions and evaluations" (brought to life through generic statements) affect one's construction of their identity from a very young age, meaning that how a teacher views a student has a significant effect on the person they will become (Levitan & Carr-Chellman, 2018).

A relationship built on the maxim of quality has the most effect on achievement motivation. Parents and teachers, both relationships that rely on respect and trust, play a large role in the impact of generic language on achievement motivation, especially when they use generic statements that reserve one trait for one group and imply that the other group does not have that trait.

4. **Setting/context**

Under different contexts and settings, whether physical or digital, achievement motivation can be

greatly affected. A physical setting like a school makes a huge impact on motivating children to make more academic achievements. According to a study conducted in middle schools trying to figure out the relationship between school as a physical context, achievement motivation, and academic engagement, when teachers provide clear expectations with consistent responses, students are more likely to participate in academic tasks (Wang et al 2013). However, if students are assigned schoolwork that is not interesting or relevant to their personal goals and interests, their motivation to achieve more academically will be limited; to change that, Wang proposed that students should have the option to do schoolwork that is relevant to their personal goals and interests. Another study separated children as "fast readers" or "typical readers" and tested them in the spring of their 1st, 3rd, and 5th grade in regards to their achievement tests in reading. It was found that the "fast reader" group's literacy skills were developed with outside influences not included in the classroom, but "typical readers" group had the higher motivation to achieve better scores in reading tests because of higher emotional quality in the interactions between teacher and child (Pianta et al 2008). Research also shows that libraries in schools also make a huge impact on increasing children's achievement and motivation, according to a study based on 10 schools in New York that found that librarians and library programs positively influenced students' research skills development and motivation for research inquiry (Small et al 2010). In a physical setting like the library where help is provided for students, they are motivated for more academic achievements. The help and resources that students get from it increased their reading interests, reading skills, and test scores. Wherever there is a positive interaction between an expert and children in a physical setting, there is a positive outcome with more motivation to make more academic achievements, which is evident in an increase in test scores.

Different digital contexts can also create different effects on children's motivations to achieve more. For example, a study tested the impact of electronic books on motivation and achievement in two different 4th grade classes in two consecutive years as the control group and experimental group. The results discussed that reading motivation in the experimental group (which used electronic books to read in class) was higher than the control

group (who were not given electronic books to read in class) in both male and female children, but female children had an overall higher motivation score than male children(Hess 2014). Another study involves playing a game that teaches kids natural selection concepts on a touchscreen in a museum (Hawkins et al 2019). Participants are randomly assigned scientists with different genders and gender expressions (high masculine male, low masculine male, high feminine female, and low feminine female) who teach the game rules. The result from the study highlighted that for younger children (9 to 10 years old), high masculine male and low feminine female scientists led to the highest achievement scores within the game and were the most motivating for them to keep playing and earn a high score; in contrast, high feminine female and low masculine male scientists had the lowest achievement scores and were the least motivating for them. However, for older participants, scientists' gender expression (such as low or high masculinity or femininity) did not make a difference, while sex (male or female scientist) did make a difference. In this case, whatever children see in the electronics in a digital setting can impact their motivation to achieve more.

Social media also creates a significant impact on older students' academic achievement evident in their test scores and their Grade Point Average (GPA), depending on what students are using social media for. In a study limited to college students in Colombo, Sri Lanka, social media did not create a significant impact on students' studies, but it was clear that spending hours on social media and student exam scores were not positively correlated, and students who spent fewer hours on social media had excellent scores on exams (Balalle 2018). Other researchers found similar results with more factors considered such as lifestyle habits and GPA, which all showed that higher social media usage was a strong predictor of poor academic performance and low GPA regardless of participants' reported control of time and study environment (Hamad 2020, Barton et al 2021). Overall, although social media creates a negative impact on achievement motivation the longer children spend time on it, how children utilize different digital settings and what they do in these contexts can determine how it affects their achievement motivation.

Discussion

In conclusion, the structure of language plays a crucial role in shaping our perceptions and worldviews. The implications of language are particularly pronounced in gendered languages, emphasizing the importance of everyday language use and its impact on children's cognitive development. This highlights the need for increased awareness of language's effects, particularly in early childhood education, where young and impressionable minds are most susceptible to forming assumptions and stereotypes about themselves and their abilities. The impact of language extends beyond childhood, affecting the workplace and perpetuating gender inequity in job entry and advancement. Thus, we need to be mindful of the language we use and the relationships in which it is used, as parents and teachers have the greatest impact on children's language acquisition and development. Additionally, we must also recognize the influence of digital media consumption, which can perpetuate societal standards and stereotypes. Despite the wealth of research on language's effects, there are a couple noteworthy limitations from the reviewed studies above, such as small sample sizes and limited cross-cultural data, suggesting the need for further research into this subject for future psychologists and scientists. Nevertheless, overall, this review underscores the need for a thoughtful and critical approach to language use and its impact on children's behavior, heuristics, and stereotypes.

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