Gender Essentialism Among Adolescents: Comparative Analysis of Essentialist Beliefs About Sex and Gender Norms in LGBTQ+ and non-LGBTQ+ Secondary Students

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ABSTRACT

Gender essentialism, the belief that gender traits are innate and immutable, plays a critical role in shaping societal norms. Although research has focused on how essentialist beliefs develop, little is known about modulation across diverse gender expressions and partner preferences, particularly during adolescence. This study aimed to explore essentialist beliefs, using a novel self-reported questionary, in LGBTQ+ adolescents compared to their non-LGBTQ+ peers, (n=1037; ages 16–18). Results showed that LGBTQ+ represent ≈25% of students and this group showed significantly lower gender essentialism than their peers. However, all adolescents were influenced by prevailing societal expectations. These findings highlight the importance of understanding how gender essentialism operates within vulnerable populations and suggest potential implications for promoting gender equality in educational settings.

Keywords: GENDER ESSENTIALISM, LGBTQ+, ADOLESCENCE, GENDER IDENTITY, SOCIAL ESSENTIALISM.

Essentialism refers to the belief that categories are assumed to have an inherent, immutable essence that defines their members and offers rich inductive potential (Medin & Ortony, 1989). High degrees of essentialism in children have been widely documented (Gelman, 2004; Gelman & Taylor, 2014), with evidence showing that children as young as four years old exhibit essentialist thinking (Gelman, 2003; Rhodes & Mandalaywala, 2017). Interestingly, this pattern appears consistently across diverse cultures (Rhodes & Mandalaywala, 2017; Davoodi, Soley, Harris & Blake, 2020), suggesting that cultural differences alone may not fully account for the development of essentialism. Instead, biological relevance, the extent to which categories are perceived as biologically innate, might play a more critical role in shaping essentialist beliefs. In contrast, some evidence points to cultural influences as well. For example, a study comparing children in the American Midwest found that older rural children were more likely than their urban peers to essentialize gender categories. As they aged, rural children maintained rigid views of gender, while urban children adopted more inclusive views in line with their parents' beliefs, underscoring the potential influence of culture on essentialism (Rhodes & Gelman, 2009). This kind of findings highlight the intricate interplay between biological and cultural factors in the development of essentialist beliefs. To advance our understanding of essentialism's evolution across the lifespan, more research is necessary, particularly in underexplored developmental stages and across diverse cultural contexts.

Gender Identity and Essentialism in Adolescence

Although some studies have explored gender essentialism during adolescence, this developmental stage remains relatively under-explored in the literature. The majority of research in this area has predominantly focused on early childhood (as mentioned before) or adulthood,

particularly young adults already attending university (Eidson & Coley, 2014), showing that while gender essentialism may not necessarily diminish with age, it can be suppressed by more explicit reasoning processes (Eidson & Coley, 2014; Rhodes & Mandalaywala, 2017). Comparatively, there are fewer studies examining the ways in which gender essentialist beliefs specifically evolve throughout adolescence (Rhodes & Gelman, 2009; Eidson & Coley, 2014; Gelman & Taylor, 2014; Bigler & Patterson, 2017). Understanding these essentialist beliefs during this critical developmental stage could be important, as they may shape the formation of stereotypes and prejudices about socially salient groups, while also influencing the development of personal identity (Gelman & Taylor, 2014; Bigler & Patterson, 2017).

Adolescence is commonly recognized as a developmental stage during which individuals fully embrace self-exploration to gain a deeper understanding of their identity and discover their role in the world in which they live (Steinberg & Morris, 2001). It is a key moment in life for developing robust characterizations of themselves which are more differentiated and better organized in terms of their own personal ideas, beliefs and standards, and less in terms of external social mandates (Klimstra, Hale III, Raaijmakers, Branje & Meeus, 2010). Therefore, it is an exciting and stressful stage during which self-esteem, mood, self-conceptions, and self-perception, as well as other constructs are affected (Dusek & McIntyre, 2006). Among these, identity develops significantly during adolescence (Kroger, 2006; Erikson, 1968; Waterman, 1982; Côté, 2009). Identity describes, at the same time, a person's mental image of themself and the sameness with others from their group in a particular way (Steensma, Kreukels, de Vries & Cohen-Kettenis, 2013). Hence, each individual may have a number of identities, such as an ethnic identity, a religious identity, or a national identity.

Particularly, gender identity, an individual's personal sense of their own gender in relation to the similarity with others from their gender group, is considered an integral aspect of a person's overall identity and may impact various aspects of their life, including self-perception, social interactions, and personal expression (Wood & Eagly, 2009). It's a self-assigned label. It is important to note that gender identity is different from biological sex (which refers to the biological characterization of an individual in terms of their chromosomes, hormones, internal and external genitals, gonads, etc.) and sexual orientation (which refers to a person's enduring physical, romantic, and/or emotional attraction to individuals of the same gender, a different gender, or multiple genders). Furthermore, gender identity and gender are not synonyms either; gender is a label constructed by others, which refers to behaviors, attitudes, and personality traits which, within a culture, are typically attributed to, expected from, or preferred by persons of one gender.

During the process of gender identity formation, adolescents begin an individual journey in the context of their social interactions, exploring roles given (or allowed) by their cultures and environments, thus unfolding to different (more or less fulfilled) identities, development and outcomes. During early adolescence, commitment to a specific identity might occur without prior explorations, often influenced by parental values (referred to as *foreclosure*). In later adolescence, the adolescent actively searches for significant adult roles and values (termed *moratorium*), eventually leading to a phase where commitment is based on deliberate exploration (termed *identity-achieved*) (Kroger, 2006). Because gender identity development is presented as both an individual and a social process in which identity shapes and it is shaped by the surrounding milieu (Adams & Marshall, 1996) the role of high schools as a key scenario where teenagers shape their identities should be explored.

Essentialism and Gender Identity in LGBTQ+ Youth: Research Gaps

The existing literature has attempted to compare levels of essentialism across different cultures and therefore account for how different gender experiences and expectations, among other cultural components, might affect levels of essentialism in children (Haslam, Holland & Karasawa, 2013). However, it has focused almost exclusively in Europe (Dhesi, 2011) and the United States (e.g. Haslam, Rothschild & Ernst, 2000; Haslam, Holland & Karasawa, 2013; Gülgöz, DeMeules, Gelman & Olson, 2019). Only few studies delve into differences in essentialism with subjects from other countries (Mahalingam and Rodriguez, 2003; Davoodi, Solely, Harris & Blake, 2020), or in different ethnic groups (Mahalingam and Leu, 2005). To the best of our knowledge, there is almost no research on gender essentialism in Latin America, with the exception of a study focusing on trans children's identity, where trans children's identities are considered legitimate only when viewed through the lenses of immutability and developmentalism (Guerrero Mc Manus & Muñoz Contreras, 2018) and a study exploring the reach of essentialist discourse in Colombia, which suggest that these beliefs are present in both men and women (Bravo, 2015). Because of the wide range and variety of gender experiences that exist around the world, this could be a major limitation in existing research (deMayo, 2022) and its impact on public policies.

Here, we face the problem that little available information on essentialism means even less research focused on essentialism and the LGBTQ+ community (youth specifically). The only available literature focuses on transgender children, 6 to 11 years old, and their essentialist beliefs in terms of sex/gender when compared to those of their cisgender peers and siblings (Olson & Enright, 2018; Gülgöz, Alonso, Olson & Gelman, 2021). This research showed that all groups presented essentialist beliefs of both sex and gender (Gülgöz, Alonso, Olson & Gelman, 2021) and they showed similar levels of gender stereotype endorsement (Rubin, Gülgöz, Alonso & Olson,

2020). The main difference found was that, transgender children and their siblings essentialized gender and sex less than their unrelated cisgender peers across innate biological questions and when asked about their capacity to change during one's lifetime (Fast & Olson, 2018; Olson & Enright, 2018; Gülgöz, Alonso, Olson & Gelman, 2021). Moreover, transgender children were more flexible in terms of violations of gender stereotypes, and they were more willing to include people who violate gender stereotypes in their circle than cisgender children (Olson & Enright, 2018; Gülgöz, Alonso, Olson & Gelman, 2021). Altogether, these results suggest that being part of the LGBTQ+ community does not mean that the group will not present essentialist beliefs. Children use categorization as it has been taught to them; they attempt to make sense of the world using available categories provided by members of their communities, leading them to perceive their surroundings similarly to adults, and consequently, to hold (probably) similar essentialist beliefs (Quintana, Benjamin & Leverett, 2017). But it has been proposed that being part of the LGBTQ+ community may prompt individuals to challenge their beliefs in order to seek new categories, allowing for a broader exploration of stereotypes. This process can result, at least partly, in more flexible reasoning (Olson & Enright, 2018; Gülgöz, Alonso, Olson & Gelman, 2021). The present study aims to address this point.

Previous data estimated that gender-diverse persons represent 0.1 to 2% of populations studied (Meerwijk & Sevelius, 2017; Meyer, Wilson & O'Neill, 2021; Herman, Flores & O'Neill, 2022), but no such assessment was performed in Latin America, with one exception of one empirical study (to the best of our knowledge). Research conducted in Brazil in a representative sample of adults (n = 6000 in 26 states) found that transgender individuals represented 0.69% of the sample and non-binary persons were 1.19% (Spizzirri et al, 2021). However, no other members of the LGBTQ+ communities were surveyed as part of the study. Surveys on the LGBTQ+

population are often scarce or exhibit biases, making it difficult to achieve an accurate and comprehensive representation of this community. These limitations can undermine the quality of the available data and often fail to capture the diversity and complexity of LGBTQ+ experiences. As a consequence, studies on essentialism and LGBTQ+ adolescents are non-existent.

The present research

The present study evaluated essentialism during adolescence in two groups of secondary school students: those who are part of the LGBTQ+ community and their non-LGBTQ+ peers. To achieve this goal, we first took a necessary detour to understand the representation of LGBTQ+ youth in secondary schools in Buenos Aires, a statistic that had not yet been gathered by any survey in Argentina, to afterwards evaluate essentialist beliefs. For both endeavors, data collection was conducted using a novel self-reported questionnaire across a randomized set of schools in almost all neighborhoods in the City of Buenos Aires, Argentina. Our results showed that, far from being a negligible proportion, approximately 25% of the adolescent population reported identifying as part of the LGBTQ+ community. After assessing the percentage of the LGBTQ+ population in our experimental sample and determining that their proportion was sufficient to allow for a comparison with their non-LGBTQ+ peers, gender essentialism was evaluated in both groups. Two measures of essentialism were used, General Essentialism Score 1 and 2, and results showed significant differences between the LGBTQ+ and non-LGBTQ+ populations. Participants from the LGBTQ+ community demonstrated a significantly lower degree of essentialism only in terms of sex/gender and sexual orientation than their peers. In a control task evaluating essentialism for a personality trait, shyness, no significant differences were found between the responses of LGBTQ+ and non-LGBTQ+ students. These results strongly suggest that while LGBTQ+ adolescents exhibit lower

levels of gender essentialism compared to their non-LGBTQ+ peers, this reduction in essentialist beliefs may be more specific to gender and not extend to essentialism in general.

Materials and Methods

Participants

Data collection included 1037 observations from self-reported questionnaires conducted in a randomized representative sample of 21 secondary schools from Buenos Aires City in Argentina (including 15 public all secular, and 6 private, 4 religious and 2 secular institutions). We reached 13 out of a total of 15 different districts in the city, as follows: District 1: 21.3%; District 3: 11.7%; District 4: 9.6%; District 5: 4.4%; District 6: 6.7%; District 7: 3.3%; District 8: 5.7%; District 9: 3.6%; District 10: 3.3%; District 11: 8.7%; District 12: 5.3%; District 13: 11.1% and District 15: 5.3%. Participants were surveyed between June and October 2023.

Students who took part in the survey were aged 16-18, with an average of 16.9 years old; 47.7% attend their second to last year of secondary school, while the remaining 52.3% attend their last year of secondary school. All students gave their voluntary consent (Ethical Committee - Comité de Ética Para la Investigación Científica y Tecnológica de la Universidad Abierta Interamericana (CEICyT – UAI, Dictamen N° 1090). At the top margin of each questionnaire, the Informed Consent was displayed, stating that participation was voluntary, and individuals were free to opt out at any time. The questionnaires were anonymous, and there was no record of which questionnaire belonged to each student. Only general information about the school was collected for analysis purposes only. The confidentiality of the data collection will be maintained in accordance with Ley No. 25,326 on Habeas Data.

Measures and procedure

A novel self-reported questionnaire was implemented to gather data from schools across the city of Buenos Aires. The questionnaire allowed us to separately measure gender identity, and sexual attraction; and afterwards, using these indicators, we were able to infer the proportion of LGTBQ+ students in our population (See Table 1). We employed an 8-item measure for gender identity and a 7-item measure for sexual attraction.

		Sexual Preference						
		No answer	Man and woman	Non-binary	Man	Woman	Other	I don't know
Gender identity	No answer	-	Yes	Yes	-	-	Yes	Yes
	Cis woman	-	Yes	Yes	No	Yes	Yes	Yes
	Cis man	-	Yes	Yes	Yes	No	Yes	Yes
	Trans woman	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Trans man	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Non-binary	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	I don't know	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table 1: LGBTQ+ population: identification. Table 1 sums up the criteria used to classify students. The crossing of variables marked with a "Yes" were those of people who were considered to be part of the LGBTQ+ community, whereas those marked with a "No" were not considered to be part of the community. Therefore, bordered cells represent the non-LGBTQ+ group.

Because sexuality is a spectrum, and adolescence the period in life where one explores one's own identity, sexual orientation and gender identity questions were designed to provide students with a wide range of answers so that they could report their sexual orientation and gender identity as faithfully as possible. Nevertheless, we understand the limitations and that the choice of anchor points or categories along a scale and the labeling of these anchor points would have an impact in the choices of answers (French-Lazovik & Gibson, 1984). Furthermore, labels may influence all responses given and are influential for the response distribution (Weijters, Cabooter & Schillewaert, 2010; Weijters, Geuens & Baumgartner, 2013). But, a fully-labeled scale was shown to be associated with more significant reliability (2016; Weng, 2004; Smyth, Olson & Kasabian, 2014; Mateijka, Glueck, Grossman, & Fitzmaurice). For these reasons the questionnaire included choices for the items of gender identity and sexual preferences represented not as a rigid list, but as a nuanced spectrum of possibilities. These choices were presented so that a person may pick one of the categories to express a judgment about their identity and a different one about sexual preference, but not explicitly their sexual orientation (i.e. homosexual, heterosexual, bisexual, and so on). It was our task to combine their responses to infer their sexual orientation. This (we propose) was a key element of the questionnaire: not asking the participants to choose a particular sexual orientation from a list. Given that the teenage years are a crucial moment during which identification and a sense of self is being developed, picking a category explicitly for themselves could be challenging.

To address the issue of misreporting or underreporting (Coffman, Coffman & Ericson, 2017; Weise, Courtney & Strunk, 2021), we guaranteed privacy and anonymity to reduce the underreporting bias. Since whole classroom surveys were conducted during data collection, a

reduction or an elimination of a potential selection bias present in LGBTQ+ population measurements was expected.

Participants were given two essentialism tasks within the questionnaire (adapted from Gelman, Heyman & Legare, 2007 and Gülgöz, Alonso, Olson & Gelman, 2021): General Essentialism Score 1, an 8-item task related to social norms and General Essentialism Score 2, a 5-item task related to biological basis and immutability. There was also a control task, which included statements inquiring about shyness (a 6-item task).

For each statement presented, adolescents indicated whether they agreed or disagreed using a 5-point scale from 1 = "*totally reject*" to 5 = "*totally support*". Using this data, an index was constructed with possible values ranging from 0 to 1, where 0 represents total rejection and 1 represents total support. The remaining possible answers were converted as follows: 2 = 0.25, 3 = 0.5, and 4 = 0.75. The index value for each statement was calculated separately for LGTBQ+ and non-LGTBQ+ students. Those indexes were contrasted, and their difference was statistically tested using a t-test for mean difference. Finally, the General Essentialism Scores 1 and 2 were calculated as the mean index value for all statements used for each score. The scoring for each question was calculated separately and altogether because previous work showed that different results can be expected for each question (Gülgöz, Alonso, Olson & Gelman, 2021).

Items were not presented in randomized order because the questionnaire was conducted in paper and afterwards it was transcribed by blind coders. This allowed us to collect data from neighborhoods in Buenos Aires in which not all students have a computer room, maintaining the same format for all data collected.

Results

Descriptive Data on LGBTQ+ Students: An Initial Approach to Visibility.

The variables related to gender identity and sexual orientation were used in the analysis in order to describe the LGBTQ+ community inside secondary schools. In the self-reported questionnaire, when students were asked about their gender identity, 92.9% of the population reported cis identities, while 3% of students reported identifying as trans woman, trans man or non-binary (See Table 2a). In terms of sexual preference, students presented a variety and complex set of responses (see Table 2b).

a. Gender Identity	Responses
Cis woman	52%
Cis man	40,90%
Trans woman	0,30%
Trans man	1,80%
Non-binary	0,90%
I don't know	2,70%
No answer	1,40%

b. Sexual preference (I feel attracted mainly to…)	% Students
Men and women	14,40%
Non-binaries	0,50%
Men	40,50%
Women	35,70%
Others	4,10%
I don't know	3,10%
No answer	1,70%

Table 2. Reported (a) Gender Identity and (b) sexual preference as percentage of the total responses gathered in the questionnaire. Each participant could select only one option.

To identify LGBTQ+ population, crossing self-reported gender identity and sexual preference was needed. As explained above, our methodological strategy to avoid misreporting was not to ask directly about sexual preference using labels. Using this approach, the following groups were identified as shown in Table 1. Using this crossed information between reported gender identity and sexual preference, we constructed a variable for LGTBQ+ community belonging. Non-LGBTQ+ students were defined as individuals who identified as cisgender and reported a sexual preference for the opposite gender to the one with which they identified (see Table 3, cross-referencing information from the questions in Table 2a and 2b). Specifically, 73.8% of cis women reported being mostly attracted only to men (i.e., hetero cis women), and 80.8% of cis men reported being mostly attracted only to women (i.e., hetero cis men). Altogether, showed in Table 3, the measurements indicated that 72.6% of the population evaluated were non-LGBTQ+ students (See Table 3).

For students to be considered part of the LGBTQ+ community, two measures were constructed. The first measure included students who were marked as '*yes*' to any of the combinations of responses presented in Table 1. This initial definition included adolescents who, in response to questions about Gender Identity and/or Sexual Preference, either did not respond or responded "*I don't know".* The criteria for this definition were lax, because it was considered, as mentioned before, that gender identity develops during adolescence and students may not feel completely comfortable stating their final identity during this period but that they are not comfortable enough to report being cis or being attracted only to the opposite gender, either. Under this lax definition, 27.3% of students could be included as part of the LGBTQ+ community, which will be considered an upper bound estimation. However, when a stricter second criterion was used, excluding students who did not respond or responded "*I don't know*", then 24.6% of the students

could be included as part of the LGBTQ+ community, which will be considered the lower bound estimation. Henceforth, all measures reported in the present study were calculated according to the stricter criterion, following a conservative methodological approach (lower bound estimation).

		Sexual preference							
		No answer	Men and women	Non-binary	Men	Women	Other	I don't know	Total
Gender identity	No answer	14,9	37,4	0	27	4,4	1,2	15,1	100
		11,6	3,5	0	0,9	0,2	0,4	6,6	**1,4**
	Cis woman	1,1	18,4	0,2	73,8	1,4	2	3,1	100
		33,3	66,8	22,3	94,7	2,1	25,9	50,9	**52**
	Cis man	2,3	4,9	0,5	4,2	80,8	6,8	0,5	100
		54,4	13,8	39,2	4,2	92,5	68,1	6,1	**40,9**
	Trans woman	0	100	0	0	0	0	0	100
		0	2,1	0	0	0	0	0	**0,3**
	Trans man	0	11,2	0	0	48,4	0	40,4	100
		0	1,4	0	0	2,4	0	23,3	**1,8**
	Non-binary	0	43,7	17,3	1,4	22	2,7	12,9	100
		0	2,8	30,7	0,1	0,6	0,6	3,9	**0,9**
	I don't know	0,5	50,5	1,5	0,4	29,1	7,4	10,6	100
		0,7	9,6	7,8	0,1	2,2	5	9,2	**2,7**
	Total	**1,7**	**14,4**	**0,5**	**40,5**	**35,7**	**4,1**	**3,1**	100
		100	100	100	100	100	100	100	100

Table 3: Reported gender identity and sexual preference (%). The light grey rows represent the percentage of participants who reported different sexual preferences within each gender identity. The white cells in the columns show the percentage of participants who reported different gender identities within each sexual preference. Bolded values indicate the total percentage of each gender identity/sexual preference across all students.

It is worth noting that, to the best of our knowledge, this is the first questionnaire that measures LGBTQ+ community as a percentage of the total population in a representative sample of secondary schools in Argentina, and indeed, in Latin America.

Essentialism in context

As discussed previously, essentialism is the constructed belief that certain (social) categories are assumed to have a defining essence that is unchangeable and inherent. This belief offers children and adults a rich inductive potential to understand the world, though it presents complex concepts such as gender, nationality, religion or socioeconomic status, in rigid and simplistic terms (Medin & Ortony, 1989; Davoodi, Solely, Harris & Blake, 2020).

Here, LGTBQ+ and non-LGBTQ+ populations of secondary students were assessed in terms of how these two groups differed in their gender essentialism using different statements and, evaluating their reactions to a set of situations in which "gender norms" or gender stereotypes (related to their culture) could be interpreted as being violated.

We found a significant difference between the LGTBQ+ and non-LGBTQ+ populations in our sample. Participants from the LGTBQ+ community showed a lower degree of essentialism than their peers (*General Essentialist Score 1*: $M = 0.91$, $SE = 0.017$ and $M = 0.83$, $SD = 0.012$, respectively, p-value < 0.01, see Table 4). Note that higher values of General Essentialist Scores 1 indicate lower essentialist beliefs. For the General Essentialism Score 1, all rigid essentialist beliefs were more prevalent and significant for inferences involving activities or behaviors performed by men but typically expected from women in heteronormative societies (See Table 4 and Supplementary Table 1). Moreover, the kernel distribution plots showed that LGBTQ+ students had much higher frequency in the "totally support" level (Figure 1a). For example: '*John*

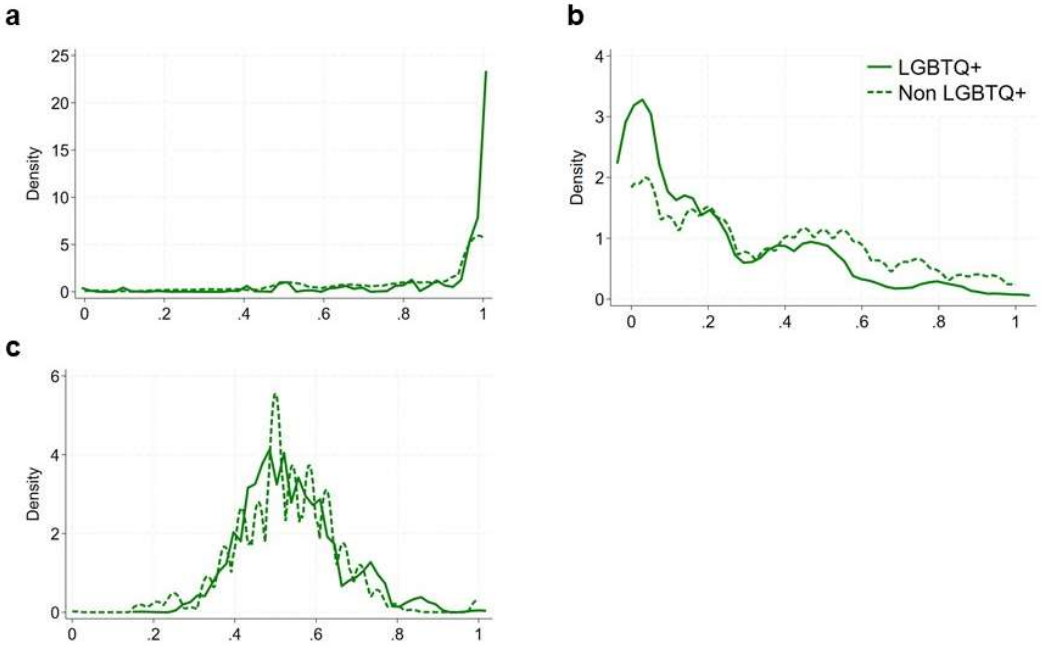
comes to school in women's clothing or uniform' presented the lowest score (non-LGTBQ+ M = 0.85, SE = 0.025 vs LGBTQ+ M = 0.72, SE = 0.017, p-value<0.01, see Table 4).

General Essentialist Score 1		
How would you react to the following situations? Score (1 = "*totally reject*" to 5 = "*totally support*")	**non-LGTBQ+ students**	**LGTBQ+ students**
Martin came to school with polished nails.	0.79** **(0.014)**	0.88** **(0.023)**
Juan comes to school in women clothing or uniform.	0.72*** **(0.017)**	0.85*** **(0.025)**
Florencia plays football with male teams.	0,91 (0.010)	0,92 (0.019)
Your friend, who used to go by Juana, now identifies himself as Pedro.	0.77** **(0.016)**	0.86** **(0.026)**
Your friends Luis and Lucas are dating.	0.83* **(0.014)**	0.90* **(0.024)**
Olivia came to school with her head shaved.	0,84 (0.013)	0,88 (0.020)
Felipe takes dance classes.	0.87* **(0.012)**	0.92* **(0.018)**
Your friends Flor and Sofi are dating.	0.86* (0.013)	0.91* (0.021)
General Essentialism Score 1	**0.83*** (0.012)**	**0.91*** (0.017)**

Table 4: Mean General Essentialist Scores 1. Table present standard deviations between parenthesis for each statement and group comparisons on each question (***= p-value<0.01, **=p-value<0.05 and *=p-value<0.1 for the difference in mean score *t-test*). Note that, higher values of General Essentialist Scores 1 refer to lower essentialist beliefs.

LGTBQ+ and non-LGBTQ+ students showed no significant differences for two statements in the General Essentialism Score 1, these included statements involving women-named characters: '*Florencia plays football with male teams*' and '*Olivia came to school with her head*

353 *shaved*', a *p*-value<0.1 for the statement: '*Felipe takes dance classes*' (see Table 4 and
354 Supplementary Table 1). These results suggest that all students presented, in general, a less
355 essentialist view when the statements described women performing activities that were expected
356 for men or activities that man usually do, like dancing (See Table 4 and Supplementary Table 1).



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358 **Figure 1: a. Essentialism Module 1** (Kernel density). The frequency of high (i.e.
359 acceptant) scores is higher among the LGBTQ+ population for General Essentialist
360 Scores 1; **b. Essentialism module 2** (Kernel density). The frequency of low (i.e.
361 rejection) scores is higher and the frequency of high (i.e. acceptant) scores is lower
362 among the LGBTQ+ population for General Essentialist Scores 2, and **c. Essentialism**
363 **module 3** (Kernel density). The differences in the density distributions between
364 LGTBQ+ and non-LGBTQ+ populations are not statistically significant for the
365 Control Task.

366 The analysis of the General Essentialist Score 2 also showed that there was a significant
367 lower essentialism among the LGBTQ+ students (M = 0.22, SE = 0.022 for the LGTBQ+
368 population and M = 0.35 and SE = 0.015 for the rest of the sample, p-value < 0,01; note that here
369 value 1 represented total rejection, See Table 5). Here lower values of General Essentialist Scores
370 2 indicate lower essentialist beliefs. The kernel density clearly showed that students from the
371 LGBTQ+ community rejected the essentialist statements presented more frequently (and
372 supported them less frequently; see Figure 1b). LGBTQ+ students rejected in a higher proportion
373 statements such as "*Sexual orientation is biological (genetical, hormonal, etc.)*", or "*a person must*
374 *be identified with gender according to the genitalia they were born with*", or "*being a "man" or a*
375 *"woman" is a fixed characteristic in people"*, or even "*people cannot change the fandom of a*
376 *football club they follow*". (See Table 5 and Supplementary Table 2). The only statement without
377 statistically significant differences between both groups is "*Being heterosexual is a fixed property*
378 *of an individual that does not really change from birth to death*". Interestingly, the statement about
379 woman homosexuality, "*Your female friends Flor and Sofi are going out*" also showed no
380 significant differences between the two groups. This could imply that, in the context of our study,
381 different sexual preferences were better tolerated by secondary students than non-conforming
382 gender stereotypes for men.
383 Regarding acceptance of homosexual preferences among peers, in General Essentialist
384 Scores 1, the statements *'Your friends Sofi and Flor are dating*' and *'Your friends Luis and Lucas*
385 *are dating*' yielded a p-value < 0.1 (Table 4), indicating a trend towards significance. In contrast,
386 in General Essentialist Scores 2, the only statement that was not significantly different between
387 the groups was, '*Being heterosexual is a fixed property of an individual that does not really change*
388 *from birth to death*' (Table 5). Altogether, these findings suggest a tendency for LGBTQ+

individuals to exhibit a more open view toward sexual preferences, while indicating a general acceptance among all adolescents toward this subject.

General Essentialist Score 2		
To what degree do you agree with the following statements? Score (1 = "*totally reject*" to 5 = "*totally support*")	**non-LGTBQ+ students**	**LGTBQ+ students**
Sexual orientation is determined by biology, genes, hormones.	0.36*** **(0.020)**	0.20*** **(0.026)**
Being heterosexual is a fixed property of an individual that does not really change from birth to death.	0,24 (0.017)	0,2 (0.030)
If a person is born with female genitalia, they are a woman even if they identify as a man; or if a person is born with male genitalia, they are a man even if they identify as a woman.	**0.42**** **(0.021)**	**0.28**** **(0.036)**
Being a woman or a man is a fixed property of a person that cannot change from childhood to adolescence.	**0.34***** **(0.020)**	**0.20***** **(0.031)**
If a person is a Boca Juniors fan, it is a characteristic that cannot change from when we are teenagers to when we are adults.	**0.39***** **(0.023)**	**0.23***** **(0.034)**
General Essentialism Score 2	**0.35***** **(0.015)**	**0.22***** **(0.022)**

Table 5: Mean General Essentialist Scores 2. Table presents standard deviations between parenthesis for each statement and group comparisons on each question (***= p-value<0.01 and **=p-value<0.05 for the difference in mean score *t-test*). Note that, lower values of General Essentialist Scores 2 refer to lower essentialist beliefs.

To better understand the essentialist belief present by LGBTQ+ and non-LGBTQ+ students, a control task was included in the study. Here, we evaluated the degree of essentialism regarding a particular personality trait. Shyness could be not considered an essentialist trait; however, essentialist beliefs could influence perceptions of personality traits, including shyness

(Haslam, Bastian & Bissett, 2004). For example, if someone believes that personality traits like shyness are innate and immutable, they might be engaging in essentialist thinking about those traits (Gelman & Heyman 1999). This could affect how they perceive and interact with shy individuals. For the control task a shy young man called Juan was introduced and the statements presented evaluated whether he would always be shy, if he could be less shy if we wanted to, if he may have many friends or, if we were talking about a shy young woman named Maria instead, there was an equal number of shy boys and girls worldwide. For this set of items, we did not find any significant differences between the responses of LGBTQ+ or non-LGBTQ+ students (M = 0.53, SE = 0.07 and M = 0.54, SE = 0.012 respectively, p-value > 0,001, See Table 6 and Figure 1c).

Control Task **To what degree do you agree with the following statements?** Score (1 = "*totally reject*" to 5 = "*totally support*")	**Non-LGTBQ+ students**	**LGTBQ+ students**
Do you believe Juan was born shy?	0.25 (0.015)	0.26 (0.030)
Do you think Juan can stop being shy if he wants to?	0.80 (0.014)	0.76 (0.024)
Do you think Juan is shy because of his environment and the things he saw?	0.73 (0.013)	0.77 (0.024)
When Juan is 45 years old, will he still be shy?	0.41 (0.012)	0.44 (0.019)
Do you think Juan has many friends?	0.46 (0.012)	0.47 (0.021)
Now picture a shy girl named Maria, do you think there are as many shy girls as shy boys?	0.51 (0.017)	0.53 (0.031)
Control task for Essentialism	0.53 (0.007)	0.54 (0.012)

Table 6: Control task. Results from the control essentialism task are presented in this table. No significant differences were found.

Altogether these results supported the hypothesis that the significant differences found for the General Essentialism Scores 1 and 2 between LGBTQ+ or non-LGBTQ+ students may be related to issues evaluated in the items evaluated, and not a lower level of essentialism as a general characteristic for the LGBTQ+ students.

Discussion

In the present study we assessed essentialist beliefs about gender in two groups of secondary school students: those who were part of the LGBTQ+ community and their non-LGBTQ+ peers.

Visibility of LGBTQ+ inside secondary school

Argentina's legal framework in matters of sexual diversity, is one of the most comprehensive in the region. Same-sex marriage has been legal since 2010 (Ley 26.618, 2010) and the Gender Identity Law of 2013 (Ley 26.743, 2013) was a pioneering legislation for the trans community not only in Latin America, but worldwide. When it comes to education, the Comprehensive Sex Education Law of 2006 (Ley 26.150, 2006) states that every school must teach sex education not in a separate subject, but as part of every subject taught from kindergarten to senior year of secondary school. Despite this notable legal framework, there are nearly no available statistics on this population's scope and main characteristics. For this reason, we conducted first a novel self-reported questionnaire across the different neighborhoods in the city of Buenos Aires in a randomized set of schools to identify LGBTQ+ students. The questionnaire allowed methodologically to separately measure gender identity and sexual attraction; and afterwards, using these indicators, it was possible to infer the proportion of LGBTQ+ students in the

438 population. Most available studies do not measure the LGBTQ+ population as a proportion of the
439 general population, which leads to confounded data, primarily because the sample surveyed
440 typically consists of individuals who actively identify as LGBTQ+. Here whole classroom
441 questionnaires allowed to minimize measurement biases of the LGBTQ+ teenage population. It is
442 important to note that estimates of LGBTQ+ representation can be influenced by biases in both directions.
443 While some organizations within the LGBTQ+ movement may suggest a higher prevalence (e.g., up to
444 80%), household surveys that rely on indirect questioning, such as asking the head of the household or
445 posing questions in the presence of parents, often report much lower rates, as low as 1-2%. Our findings
446 aim to provide a more balanced and accurate representation of this population in the school context.

447 The present results suggest that LGBTQ+ students make up a substantial portion of the
448 adolescent population, with approximately 24.6% identifying as part of this community, even
449 under a conservative estimation. This number strongly contradicts the general (*popular*) argument
450 for invisibilization that claims that the LGBTQ+ population "*is too small*". Visibility and
451 accessibility to secure academic environments is crucial for LGBTQ+ students school trajectories
452 and performance (Paceley, 2016; Kuhlemeier, Goodkind & Willging, 2021). However, this cannot
453 be achieved if we lack systematic data about their representation at schools. Results regarding
454 school climate, which refers to "*the feelings and attitudes that are elicited by a school's*
455 *environment*" (Loukas, 2007), found that it was very hostile for the LGBTQ+ community. These
456 feelings of vulnerability and discomfort result in them avoiding common spaces or deciding not to
457 partake in group activities. For example, 36.3% reported avoiding using school restrooms and
458 27.3% of students reported avoiding recreational spaces. Furthermore, this study suggested that it
459 also resulted in 15.6% of students missing four or more class days each month (100% Diversidad
460 y Derechos, 2016). Existing general literature on LGBTQ+ youth illustrate one thing: the
461 community suffers from discrimination at school (Takács, 2006; 100% Diversidad y Derechos,

2016; White et al., 2018; Jones, 2019; Kosciw, Clark & Menard, 2022; Cabral & Pinto, 2023; Relevamiento de la Diversidad, 2024) as well as bullying and harassment (Takács, 2006; Gruber & Fineran, 2008; White et al., 2018; Jones, 2019; Kosciw, Clark & Menard, 2022). Therefore, we conclude here that obtaining accurate statistics on the LGBTQ+ adolescent population within schools was necessary not only for our study on essentialism, but also crucial for informing policies and practices aimed at creating inclusive and supportive educational environments.

Gender Essentialism in LGBTQ+ and non-LGBTQ+ Adolescents.

We found that participants who were part of the LGBTQ+ community demonstrated notably less gender essentialism compared to their peers. When testing for rigidity or inflexibility in enduring violations of gender social norms -common in Argentina- using the Gender Essentialism Score 1, LGBTQ+ students exhibited a significantly lower degree of essentialism. This was especially true for inferences involving behaviors performed by men that are typically expected from women in heteronormative societies. In contrast, LGTBQ+ and non-LGBTQ+ students showed no significant differences for statements regarding the opposite, i.e., behaviors performed by women but typically expected from men.

Given that the influence of cultural components on essentialism cannot be ruled out (Rhodes & Gelman, 2009; Rhodes & Mandalaywala, 2017; Rhodes & Moty, 2020), these results aligned with expectations for Argentinean adolescents. What's particularly interesting about these findings was that the social environment of the students in this study may have had developmental consequences on their gender essentialist beliefs. On the one hand, there was a tendency to adhere or endure to certain gender social norms when women, rather than men, violate expected

484 behaviors. On the other hand, being part of the LGBTQ+ community (or not) may differentially
485 impact the development of social prejudices. Therefore, despite the early emergence of social
486 essentialist beliefs (Gelman, Collman & Maccoby, 1986; Rhodes and Gelman, 2009), our results
487 supported the hypothesis that gender essentialism also exhibits a wide-ranging developmental,
488 contextual, and cultural variability.

489 The analysis of the General Essentialist Score 2, which measures beliefs about the
490 biological basis and immutability of gender, also revealed significantly less essentialism among
491 LGBTQ+ students compared to their non-LGBTQ+ peers. This finding suggests that the LGBTQ+
492 students may have altered the abstract causal-explanatory theories present in their environment
493 due to their own personal journey of self-discovery.

494 At this point, a question arises: Do LGBTQ+ students exhibit a lower tendency toward
495 essentialism than their non-LGBTQ+ peers, regardless of the type of essentialism being evaluated?
496 This does not appear to be the case. In a control task assessing essentialism for a personality trait—
497 specifically, shyness—participants were asked whether a shy individual, whether male or female,
498 would always remain shy or could change over time. Present findings revealed no significant
499 differences between the responses of LGBTQ+ and non-LGBTQ+ students for this set of items.

500 Altogether, the results strongly suggest that while LGBTQ+ adolescents exhibit lower
501 levels of gender essentialism compared to their non-LGBTQ+ peers, this reduction in essentialist
502 beliefs appears to be more context-specific, primarily affecting their perceptions of gender roles
503 and identities. This nuanced decrease in essentialism seems not to generalize to other forms of
504 essentialism, such as those related to personality traits, indicating that the flexibility in their
505 gender-related beliefs does not necessarily extend to broader essentialist thinking. Consequently,

while the personal identity and social experiences of LGBTQ+ adolescents may lead to more flexible gender-related beliefs, their broader essentialist thinking remains influenced by the prevailing cultural norms.

Future perspectives

The results found in the present research may be especially critical when considering that the educational system is not a neutral environment, but one that perpetuates and legitimizes hierarchical social norms for different identities (Narodowski & Schargrodsky, 2005). This leads to the marginalization and invisibility of LGBTQ+ identities, while creating spaces of privilege for some and reinforcing inequality for others (Elizalde, 2014). In this context, gender essentialist thinking has been linked to an increased propensity for prejudice and discrimination (Rhodes & Mandalaywala, 2017; Skewes, Fine & Haslam, 2018). Therefore, understanding how this construct operates within vulnerable populations in different contexts carries significant implications for gender equality, particularly within schools, where it is crucial to explore whether it can be altered.

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The data necessary to reproduce the analyses presented here are not publicly accessible.

The analytic code necessary to reproduce the analyses presented in this paper is not publicly accessible.

The materials necessary to attempt to replicate the findings presented here are not publicly accessible.

The analyses presented here were not preregistered.

Conflict of interest

The authors declare that there are no competing interests.

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723 **Supplementary Table 1:** Detailed % of replies used for the construction of Essentialism score 1 divided by non-LGBTQ+ and LGBTQ+ students.

Mark how much you would support other students in the following hypothetical situations.	**(1) Total rejection**		**(2)**		**(3)**		**(4)**		**(5) Total support**		**No answer**	
	% of **non-LGBTQ+** students	% of **LGBTQ+** students	% of **non-LGBTQ+** students	% of **LGBTQ+** students	% of **non-LGBTQ+** students	% of **LGBTQ+** students	% of **non-LGBTQ+** students	% of **LGBTQ+** students	% of **non-LGBTQ+** students	% of **LGBTQ+** students	% of **non-LGBTQ+** students	% of **LGBTQ+** students
Martín came to class wearing nail polish.	4.2% (0.9%)	5.3% (1.8%)	4.5% (1.1%)	1.3% (1.1%)	**19.5%* (2.1%)**	**9.8%* (2.6%)**	12.8% (1.8%)	6.6% (2.2%)	**57.7%*** (2.6%)**	**75.6%*** (3.7%)**	1.3% (0.5%)	1.4% (1.1%)
Juan comes to class in women's clothes/uniform.	**8.8%* (1.4%)**	**3.4%* (1.4%)**	7% (1.4%)	4.5% (2%)	18.7% (2%)	12.2% (2.8%)	17.9% (2.1%)	10.2% (2.6%)	**45.5%*** (2.6%)**	**68.7%*** (4%)**	2.1% (0.7%)	1% (0.6%)
Florencia plays soccer with men.	2.2% (0.7%)	2.9% (1.1%)	0.4% (0.4%)	1.2% (1.1%)	7.4% (1.4%)	6.9% (2.1%)	8.8% (1.5%)	3.3% (1.6%)	79% (2.1%)	84.9% (3%)	2.3% (0.7%)	0.9% (0.6%)
Your friend, who used to identify as Juana, now identifies as Pedro.	8.8% (1.4%)	4.9% (1.8%)	3.8% (0.9%)	3.6% (1.7%)	**15.3%* (1.9%)**	**7.8%* (2.2%)**	**16.3%* (2%)**	**8%* (2.4%)**	**54.2%*** (2.6%)**	**73.2%*** (3.8%)**	1.6% (0.6%)	2.5% (1.3%)
Your friends Luis and Lucas are dating.	4.4% (0.9%)	6% (2%)	**3.5%*** (1%)**	**0.1%*** (0.03%)**	12.8% (1.7%)	7% (2.3%)	**13.3%** (1.8%)**	**4.9%** (1.8%)**	**63.9%*** (2.5%)**	**81.1%*** (3.4%)**	2.1% (0.7%)	0.9% (0.6%)
Olivia came to class having shaved her head.	4% (0.9%)	2.8% (1.1%)	2% (0.7%)	1.2% (1.1%)	14.1% (1.8%)	9.7% (2.6%)	12.9% (1.8%)	11.9% (2.8%)	64.6% (2.5%)	72.3% (3.9%)	2.4% (0.8%)	2.1% (1.3%)
Felipe takes dance lessons.	3.2% (0.8%)	2.7% (1.1%)	2.3% (0.7%)	1.8% (1.1%)	12.1% (1.7%)	6% (1.9%)	9.7% (1.6%)	4.1% (1.8%)	**70.7%** (2.3%)**	**83.4%** (3.1%)**	2% (0.7%)	2% (1.2%)
Your friends Flor and Sofi are dating.	3% (0.8%)	4.1% (1.6%)	**4.1%** (1.1%)**	**0.5%** (0.3%)**	11.4% (1.7%)	6.8% (2.2%)	9.4% (1.5%)	4.2% (1.7%)	**70%** (2.4%)**	**83.7%** (3.1%)**	2.1% (0.7%)	0.9% (0.6%)

Supplementary Table 2: Detailed % of replies used for the construction of Essentialism score 2 divided by non-LGBTQ+ and LGBTQ+ students

How much do you agree with the following statements?	(1) Not at all		(2)		(3)		(4)		(5) Totally		No answer	
	% of **non-LGBTQ+** students	% of **LGBTQ+** students	% of **non-LGBTQ+** students	% of **LGBTQ+** students	% of **non-LGBTQ+** students	% of **LGBTQ+** students	% of **non-LGBTQ+** students	% of **LGBTQ+** students	% of **non-LGBTQ+** students	% of **LGBTQ+** students	% of **non-LGBTQ+** students	% of **LGBTQ+** students
Sexual orientation is determined by biological factors such as genes and hormones.	**41%*** (2.6%)**	**61.2%*** (4.2%)**	12.3% (1.8%)	13.4% (3%)	15.5% (1.9%)	10.8% (2.7%)	8.9% (1.5%)	5.1% (1.9%)	**18.1%*** (2%)**	**6%*** (1.8%)**	4% (0.9%)	3.4% (1.3%)
Being heterosexual is a fixed characteristic of an individual which does not really change from birth to death.	**54%* (2.6%)**	**67.4%* (4.1%)**	12.6% (1.8%)	7% (2.2%)	14.3% (1.8%)	12.5% (3%)	5.6% (1.2%)	2.9% (1.4%)	8.8% (1.4%)	8.8% (2.4%)	**4.7%** (1%)**	**1.4%** (0.4%)**
If a person is born with female genitalia, she is a woman even if she identifies as male; or if a person is born with male genitalia, he is a man even if he identifies as a woman.	**34.4%*** (2.5%)**	**60.8%*** (4.2%)**	**13.6%** (1.9%)**	**5.2%** (1.8%)**	14.9% (1.8%)	11% (2.8%)	7.6% (1.4%)	5.4% (2%)	24.8% (2.2%)	16.2% (3.1%)	**4.7%** (1%)**	**1.4%** (0.4%)**
Being a woman or a man is a fixed characteristic of a person which cannot change from childhood to adolescence.	**43.4%*** (2.6%)**	**67.4%*** (4%)**	10.6% (1.7%)	7.6% (2.1%)	17.9% (2.1%)	11% (2.6%)	6.2% (1.3%)	3.2% (1.6%)	16.5% (1.9%)	8.9% (2.4%)	**5.4%* (1.1%)**	**1.9%* (0.7%)**
If a person is a Boca fan, this is a characteristic that cannot change from adolescence to adulthood.	**44.4%*** (2.6%)**	**68.6%*** (3.9%)**	6.5% (1.3%)	4% (1.7%)	11.9% (1.7%)	8.9% (2.3%)	6.3% (1.3%)	2.8% (1.4%)	**26.3%** (2.3%)**	**14.4%** (3%)**	**4.6%** (1%)**	**1.3%** (0.4%)**