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Growing Up Across Cultures: Girls' Perceptions of Puberty in Germany and Ghana

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ABSTRACT: This mixed-methods study examined adolescent girls' perceptions of puberty in Germany and Ghana to better understand cross-cultural differences in the personal evaluation of physical development during puberty. A total of 418 girls (198 from Germany, 220 from Ghana; mean ages 13.73 and 12.57 years, respectively) completed classroom-based questionnaires assessing overall evaluations of puberty, perceptions of specific bodily changes, and body image. Open-ended questionnaire responses and two focus groups (N = 11) provided qualitative insights. Quantitative findings showed that German girls reported significantly more negative perceptions of puberty than Ghanaian girls. The most pronounced cross-cultural difference concerned menstruation, which was evaluated more negatively by German than by Ghanaian participants. German girls also reported greater real-ideal body discrepancy, suggesting greater body dissatisfaction, although perceived body shape did not differ between groups. Qualitative findings supported these results. German participants described puberty as emotionally challenging, marked by self-doubt, social comparison, media influence, and appearance-related insecurities. In contrast, Ghanaian girls more often framed puberty as a natural transition into adulthood and womanhood, emphasizing fertility, responsibility, and guidance from trusted adults. Overall, the findings highlight both shared and culturally specific meanings attached to puberty and underscore the importance of culturally sensitive puberty education and support systems.

Keywords: Adolescence; Puberty; Cross-cultural; Mixed-methods

1. Introduction

Adolescence is a critical developmental period characterized by profound biological, psychological, and social transformations, with puberty representing one of its most significant transitions [1,2]. During this period, adolescents undergo rapid physical maturation, increased emotional variability, and shifts in identity formation, making adolescence a crucial period for psychological adjustment [2–5]. Puberty is also associated with heightened attention to bodily appearance and increased vulnerability to body

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dissatisfaction and internalizing symptoms, particularly among girls [5,6]. At the same time, puberty can also be experienced as a meaningful developmental milestone associated with maturity and personal growth [2,3,7]. Although puberty is a universal biological process, adolescents' experiences and perceptions of these changes vary substantially across cultural and social contexts, shaped by cultural norms, socialization practices, and broader societal perceptions of the body and physical development [7–9]. Culture may therefore play a buffering role in adolescents' psychosocial adjustment, influencing outcomes such as body image, self-esteem, and overall well-being [10,11]. A comprehensive understanding of the cultural and contextual factors that shape how female adolescents evaluate puberty and their body image is essential for developing targeted and relevant prevention and intervention strategies for adolescent well-being [7,12,13].

In girls, puberty is characterized by significant physiological changes, including increases in body weight and the redistribution of body fat. Rising estrogen levels contribute to the accumulation of fat, particularly around the hips, thighs, breasts, and buttocks, resulting in the development of the typical female body shape [14] in addition to changes in perspiration, odours, acne, and pubic hair growth [15], and increases in height and overall body mass. These physical changes support reproductive maturation and the onset of menstruation but may also increase awareness of bodily appearance and shape, with implications for self-perception, and consequently for mood and behavior [16,17].

Expanding on that, a substantial body of research identifies puberty as a critical period for the development of body image, body dissatisfaction, and mental health difficulties through a range of interconnected processes [18–20]. In this context, body image refers to an individual's multidimensional evaluation of their body attributes, whereas body dissatisfaction reflects the perception of a discrepancy between one's body and the idealized body [21]. During puberty, hormonal changes may heighten emotional reactivity and self-consciousness, making girls particularly vulnerable to appearance-related topics and concerns, personally, but also in social interactions [22]. More specifically, increases in levels of the hormones estradiol, progesterone, and DHEA have been associated with female adolescents' internalization of the thin ideal and body dissatisfaction [23–25]. At the same time, adolescents show increased sensitivity to social comparison processes, and in particular, girls have a greater tendency to derive self-worth from appearance-related feedback and perceived social acceptance from peers, parents, and other adults [26]. These processes play a central role in shaping female adolescents' personal experiences of pubertal development. In addition, physical changes can amplify the salience of physical appearance, leading adolescent girls to frequently compare themselves to peers and highly idealized media representations. Such comparisons can make them even more vulnerable to developing body dissatisfaction and reinforce appearance-based self-worth contingencies [18–20,27,28]. These dynamics are especially relevant in the Global North, where female attractiveness is strongly tied to thinness, bodily control, and aesthetic perfection [29,30]. In line with this, negative perceptions of pubertal body changes have been linked in female adolescents from the Global North to body dissatisfaction, lower self-esteem, depressive symptoms, and disordered eating behaviors, highlighting puberty as an important developmental risk period rather than merely a normative transition [19,31].

Although puberty is biologically universal, its meaning and subjective experience are deeply embedded in sociocultural contexts. Cultural norms, gender roles, societal expectations, and beauty ideals shape how adolescents interpret bodily changes, evaluate their appearance, and understand the transition to adulthood [2]. Cross-cultural research further suggests that developmental processes are embedded in culturally specific meaning systems that shape emotional responses and behavioral outcomes through interactions within proximal developmental contexts [32]. In some contexts, puberty is framed as a positive and socially meaningful transition associated with maturity, fertility, and social recognition, whereas in others it may be experienced as a period of uncertainty, stress, and heightened pressure related to appearance and peer evaluation [7].

Consequently, puberty itself is not inherently problematic and a risk for negative developmental trajectories in girls. Rather, its psychological consequences depend largely on the surrounding sociocultural

context. Ge and Natsuaki's [33] contextual amplification hypothesis proposes that contextual conditions, such as peer norms, family climate, media exposure, and broader cultural values, can either amplify or buffer the effects of pubertal development on adolescent adjustment. In highly appearance-focused environments, puberty may function as a developmental risk factor. Conversely, in contexts where bodily changes are framed more positively, as signs of maturity, fertility, and social recognition, the same biological processes may foster resilience and positive self-evaluation. This perspective is particularly relevant for Global North-Global South comparisons, where pubertal development may be embedded in substantially different cultural meaning systems and social expectations. Previous research has highlighted significant cross-cultural differences in female adolescents' perceptions of puberty. Notably, female adolescents in Germany, especially compared to their peers in Ghana, tend to report more negative overall evaluations of pubertal body changes [7]. Such negative evaluations may constitute a risk factor for maladaptive developmental trajectories during adolescence and may extend into adulthood, particularly through increased vulnerability to body dissatisfaction, internalizing symptoms, and reduced psychosocial well-being [31,34], necessitating a closer look into the specific pubertal experiences of female adolescents from Germany and Ghana to shed more light on these differences.

1.1. The German Adolescent Context

Germany is a high-income European country where female adolescents grow up in a sociocultural environment that emphasizes individual autonomy, gender equality, and self-expression. Nevertheless, gendered expectations and societal norms continue to influence girls' developmental experiences, particularly in relation to body image, academic pathways, and social roles [35–37].

The German education system, characterized by early academic tracking, shapes the opportunities and trajectories of female adolescents through differentiated school types such as Gymnasium, Realschule, and Hauptschule [38]. Female adolescents generally achieve high levels of educational attainment, yet subtle gender disparities persist in subject choices and career orientations. Schools play a central role in delivering sexuality education, which equips female adolescents with knowledge about menstruation, contraception, and reproductive health [39]. This structured educational approach contributes to relatively high levels of health literacy among girls.

Beauty ideals among German female adolescents are strongly influenced by media and digital platforms originating in the Global North, which emphasize thinness, fitness, and aesthetic perfection [40]. Social media intensifies these pressures by promoting curated and idealized representations of female bodies, often leading to increased self-comparison and body surveillance [27]. Although body positivity movements have gained some visibility in the past years, research indicates that body dissatisfaction remains prevalent among adolescent girls and is associated with negative psychological outcomes such as low self-esteem and disordered eating behaviors [41].

In sum, puberty in Germany is typically approached within a biomedical and educational framework, in which adolescents generally receive early and comprehensive information about menstruation and bodily changes, facilitating a more informed and less stigmatized experience of puberty [39]. Access to healthcare services, including gynecological care, further supports girls during this developmental phase. In contrast to some cultural contexts in which puberty is marked through formal rites of passage linked to physical maturation, Germany does not generally maintain secular or culturally widespread puberty rituals tied directly to bodily development. Transitional ceremonies that do exist, such as Christian confirmation, are primarily associated with religious or social status transitions rather than biological maturation [42]. However, despite these knowledge-based and structural supports, puberty remains a period of heightened vulnerability, particularly with regard to body image concerns and sensitivity to peer and societal evaluation [2]. These issues are typically not addressed by current approaches to puberty and sex education in Germany.

1.2. The Ghanaian Adolescent Context

Ghana is a lower-middle-income country in West Africa where gender norms and expectations strongly shape the developmental experiences of female adolescents. Female adolescents' socialization is often embedded in extended family and community structures, where ideals of femininity emphasize respectability, modesty, and preparation for adult roles, including marriage and motherhood [43]. While opportunities for female adolescents have expanded in recent decades, structural inequalities and sociocultural expectations continue to influence their educational and psychosocial trajectories.

The Ghanaian education system provides increasing access for female adolescents; however, they remain disproportionately affected by barriers such as household responsibilities, economic constraints, and early marriage or pregnancy [44,45]. Schools represent critical spaces not only for academic development but also for gendered socialization, where expectations regarding appropriate female behavior, appearance, and aspirations are reinforced. For many female adolescents, continued school attendance is closely tied to delayed marriage and improved life outcomes.

Beauty ideals among Ghanaian female adolescents reflect a dynamic interplay between traditional and globalized influences. Historically, a fuller female body has been associated with health, attractiveness, and fertility here [46]. However, increasing exposure to global media has introduced beauty ideals originating largely in the Global North, emphasizing thinness, lighter skin, and specific facial features [47,48]. Female adolescents are particularly susceptible to these competing standards, which may contribute to body dissatisfaction and practices such as skin-lightening [49]. The negotiation of these ideals occurs within peer groups, family expectations, and broader societal discourses on femininity.

Puberty in the Ghanaian context involves both biological and sociocultural transitions [42]. Menarche may carry social meaning depending on ethnic and familial traditions, although formal puberty rites have declined, particularly in urban areas [50]. In most families, the onset of menarche is celebrated; however, this is followed by the lived experiences involving cultural taboos and challenges in accessing menstrual hygiene products [51]. These experiences are influenced considerably by socioeconomic status, rural-urban residence, and religious background [52]. Access to comprehensive sexual and reproductive health education remains uneven, and discussions about puberty and sexuality are often constrained by religious and cultural taboos [53]. Consequently, adolescents may rely on peers or informal sources for information, which can contribute to gaps in knowledge and increased vulnerability.

1.3. The Present Study

Despite previous findings [7] indicating marked differences between German and Ghanaian adolescent girls in their pubertal experiences and evaluations, accompanied by the specific contextual circumstances in which they grow up, the developmental processes that give rise to these differing evaluations remain insufficiently understood. Existing studies are often limited in sample size and methodological scope, which may not fully capture the subjective meanings adolescents attach to pubertal experiences [54]. Moreover, although research on puberty and adolescence predominantly focused on girls, their own subjective perspective remains underrepresented in puberty research. The subjective interpretation is important and plays an essential role in developmental outcomes, and qualitative approaches are especially valuable for capturing this perspective. Mixed-methods designs that combine standardized quantitative assessment with qualitative exploration are therefore particularly useful, as they allow for the identification of both general patterns and culturally specific meanings while strengthening interpretive depth and ecological validity [54,55]. Additionally, relatively few studies have directly compared adolescents' perceptions of puberty across distinct cultural contexts using comparable measures, making it difficult to disentangle universal developmental processes from culturally specific experiences.

Based on this, the present study seeks to address these gaps by examining the underlying risk mechanisms that contribute to cross-cultural differences in girls' perceptions of pubertal development in Germany and Ghana. By drawing on larger samples and incorporating multiple methodological perspectives, this research aims to generate a more nuanced understanding of how cultural contexts shape puberty-related experiences, body image development, and psychosocial adjustment. The combination of both methodological approaches, a mixed-methods design integrating quantitative survey data, open-ended responses, and in-depth qualitative data generated through focus groups, enables a comprehensive analysis of gender-specific developmental conditions during puberty and provides a robust foundation for developing evidence-based, culturally sensitive intervention strategies.

Therefore, the current study aims to comparatively investigate the cross-national pubertal experiences of adolescent girls in Germany and Ghana and their personal perceptions of pubertal body changes. One hypothesis and two objectives/research questions were formulated to guide the study. Based on previous research, which indicates that pubertal changes conform more to the Ghanaian girl's body ideals, it was hypothesized for the quantitative part of the study that German girls will have less positive evaluations of puberty and pubertal bodily changes. For the qualitative sections, two objectives are proposed: (1) To investigate whether there are any articulated differences between German and Ghanaian girls in how they perceive puberty, (2) To explore the distinct experiences of adolescent girls from both countries on how they navigate pubertal changes.

The present study extends previous findings (Weichold et al., 2025), which provided a first exploratory snapshot of 16 countries based on small country-specific samples and a broad evaluation of puberty by adolescents. All participants in the present study were newly recruited in 2025 and do not overlap with those included in the earlier project. The present study focuses explicitly on girls in Germany and Ghana, draws on larger country samples, and includes newly conducted focus groups. This enables the previously observed descriptive contrast to be verified while, at the same time, its developmental and experiential contexts are examined in greater depth.

2. Methods

This study is a follow-up to the global Puberty × Culture Project, which involved 16 countries worldwide and was coordinated by the Department of Youth Research at Friedrich-Schiller-University of Jena, Germany (PI: Karina Weichold; Weichold et al., 2024, 2025). Based on the findings of this project, we conducted a present mixed-methods study in 2025, focusing on female adolescents from Germany and Ghana and integrating three distinct data sources. First, a survey was administered to collect quantitative data in both countries. Second, the survey included embedded open-ended questions that provided qualitative insights. Third, focus group discussions were conducted following the survey to generate additional in-depth qualitative data. The methodology for the survey and focus groups is presented below.

2.1. Quantitative Survey

2.1.1. Material and Procedures

The research team in Germany developed and distributed standardized study materials in English and German, including a questionnaire with closed and open-ended questions as well as a procedural checklist, scale documentation, datasheet, and a comprehensive manual. The manual and procedural checklist were developed to reduce potential sources of method bias. In both countries, the female adolescents completed the pen-and-paper questionnaire in German in Germany and in English in Ghana during classroom sessions of approximately one hour, which were overseen by a research partner in collaboration with a school teacher. Data were processed locally and combined in Germany for quantitative analysis. Both datasets were checked for coding accuracy and consistency, and, when necessary, verified against original questionnaires.

2.1.2. Sample

Data collection took place in 11 public schools in urban areas of Thuringia, Germany (Artern, Eisenach, Erfurt, Friedrichroda, Gera, Gotha, Jena, Rudolstadt, Saalfeld), and in 4 schools in the Greater Accra Region of Ghana, also an urban area. Schools in both countries were recruited through established institutional networks. The German sample was drawn from Grade 7 and 8 classes in public schools located in nine cities in Thuringia, whereas the Ghanaian sample was recruited from JHS 2 classrooms in four schools in Accra. Because participation required written parental consent and student assent, only students with returned consent forms were eligible to participate. All eligible students present on the day of assessment completed the questionnaire. No data were available on students whose parents did not provide consent or who otherwise did not participate. Therefore, a conventional response rate could not be determined, and potential selection effects cannot be excluded.

The study sample consisted of 418 female adolescents, with 198 (47.37%) participants from Germany and 220 (52.63%) participants from Ghana. German girls were on average 13.73 years old (*SD* = 0.65, ranging from 12–16), 164.99 cm tall (*SD* = 6.68, ranging from 150–190), weighed 53.23 kg (*SD* = 8.92, ranging from 39–77), and had a body mass index of 19.53 (*SD* = 2.84). Ghanaian girls were on average 12.57 years old (*SD* = 0.87, ranging from 11–16), 157.22 cm tall (*SD* = 9.54, ranging from 130–189), and weighed 51.19 kg (*SD* = 11.42, ranging from 30–90), and had a body mass index of 20.81 (*SD* = 4.58). Among participants with valid menarche-status data, 91.1% of German girls and 73.7% of Ghanaian girls had experienced menarche. Mean age of first menarche was 11.77 years (*SD* = 1.02) in the German sample and 11.16 years (*SD* = 1.11) in the Ghanaian sample. Approximately two-thirds of female adolescents in both countries (German adolescents: 72.2%; Ghanaian adolescents: 79.1%) rated their parents' financial situation as good or very good.

2.1.3. Quantitative Measures

The questionnaire addressed sociodemographic variables, general experiences of puberty, and perceptions of bodily changes during puberty.

Puberty in General

This broad and evaluative item was designed for this project as a semantic differential to assess adolescents' personal meaning associated with puberty. Female adolescents were asked to rate 'Puberty is... negative/positive' using a 7-point Likert scale (0 = negative; 6 = positive). Higher scores indicated more positive and favorable views of puberty.

Evaluation of Bodily Changes

The four items assessed female adolescents' evaluation of bodily changes and were designed specifically for this project. The adolescents rated their bodily changes on a continuum from negative (−3) to positive (3) using a 7-point Likert scale based on the following items: 'During puberty, the belly changes. I think that is:', 'During puberty, the breasts change. I think that is:', 'During puberty, the buttocks change. I think that is:' and 'Menstruation occurs during puberty. I think that is:'. Participants responded to these items, higher scores indicated that adolescents had more positive and favorable views on the specific bodily changes in puberty.

Body Image

Body image was assessed using a Body Image Scale [56,57], which presents female figures in nine weight gradations ranging from very thin to very overweight. Participants selected the figure that most closely resembled their current body shape and the figure that represented their ideal body shape. Responses

ranged from 1 (very thin) to 9 (very overweight). A real-ideal discrepancy score was calculated by subtracting the ideal rating from the perceived current rating, with positive values indicating perceiving oneself as heavier than desired and negative values indicating perceiving oneself as thinner than desired.

2.1.4. Qualitative Measures

The qualitative measure (open-ended questionnaire responses) consisted of a follow-up open-ended question relating to the general puberty questions in the quantitative measure above: 'Puberty is...negative/positive, why?'.

2.1.5. Analytical Approach

Quantitative analyses were performed using IBM SPSS Statistics version 27 for Windows. Descriptive statistics included frequencies, means, standard deviations, and ranges. Initial unadjusted country differences were examined using independent-samples *t* tests, or Welch's *t* test when Levene's test indicated unequal variances.

To account for the age difference between the German and Ghanaian samples, separate ANCOVAs were conducted for the eight quantitative items described above. Country was entered as a fixed factor and age as a continuous covariate. Initial models included a Country × Age interaction to assess homogeneity of regression slopes; when non-significant, this term was removed, and the reduced model was interpreted. Estimated marginal means were calculated at the mean age of the respective analytic sample.

Because homogeneity of error variances was violated for several outcomes, inference was based on HC3 heteroscedasticity-consistent standard errors and confidence intervals. Country effects are reported as adjusted mean differences with robust standard errors, 95% confidence intervals, *p* values, and partial eta squared (η_p^2). All tests were two-sided with $\alpha = 0.05$, and Holm correction was applied across the eight country effects within each analysis set.

Sensitivity analyses repeated all ANCOVAs in the subsample of participants who had experienced menarche. Menarche status and self-reported age at menarche were also examined descriptively. Notably, one implausible age-at-menarche value exceeding the participant's current age was recoded as missing.

Qualitative Analysis of Open-Ended Questionnaire Response

First, two initial coders worked independently, reading through the transcribed data multiple times to immerse themselves in it and gain a good sense of it. They then identified keywords within the responses and grouped them into codes and themes for each item. In addition to the themes, the coders generated nominal data to test inter-coder reliability [58–60] by categorizing the responses as follows: 1 = negative, 2 = neutral, 3 = positive. In the second step of the analysis, two additional researchers jointly discussed the generated codes and themes and agreed on the final themes. These final themes were then checked by a puberty research expert who was familiar with the study and the data to provide feedback and confirm the final themes. This ensured the quality and precision of the analysis and results.

2.2. Qualitative Study Design: Focus Groups

In order to enhance the findings of the questionnaire survey and to acquire a more profound understanding of adolescents' perspectives on puberty, we conducted an additional qualitative study design based on two focus groups involving female adolescents from Germany and Ghana.

Focus groups are a semi-structured qualitative method in which a moderator guides discussion using a predefined framework while allowing for spontaneity and participant interaction [61–63]. They are particularly suitable for adolescents, as peer interaction encourages open discussion and reveals shared meanings, social norms, and differing perspectives more effectively than individual interviews [64,65].

This makes them especially useful for capturing multiple viewpoints as well as contradictions and inconsistencies in opinions [66].

2.2.1. Participants and Recruitment

A total of 11 girls (13 years old on average) took part in two focus groups: 6 participants in Germany and 5 participants in Ghana. This group size allowed for varied perspectives while still encouraging active participation. No participants withdrew from the study. In Germany, participants were recruited through school contacts in October 2025, while in Ghana, recruitment took place through school contacts in June 2025.

All participants and their parents/guardians received written and verbal information regarding the study's purpose and procedures. Participation was voluntary, and participants could withdraw at any time without consequence. Informed consent was secured from adolescents and their parents/legal guardians. Given the group-based format, the limits of confidentiality were discussed explicitly, and participants agreed to respect the privacy of others in the group.

2.2.2. Data Collection Procedure

The project team in Germany developed a semi-structured discussion guide in German and English based on the extant literature and study objectives in close cooperation with the Ghanaian cooperation partner. The guide included open-ended questions, probes, and prompts designed to encourage discussion and allow participants to build on one another's views, covering topics such as their puberty experiences in general and body image.

Each focus group was led by a female researcher of the project team with experience in qualitative youth research. We intentionally selected a presenter of the same gender to encourage the female adolescents to speak more freely. A second researcher attended each session, taking detailed field notes on non-verbal interactions, group dynamics, and contextual features that could inform the analysis. At the beginning of every discussion, participants were reminded of the importance of group confidentiality, voluntary participation, and mutual respect. A comfortable and trusting discussion environment was established through the use of rapport-building activities. The focus group in Germany was conducted online via Zoom in November 2025, providing a neutral and youth-appropriate setting. The focus group in Ghana was conducted in July 2025 in a quiet, private place, providing a neutral and youth-appropriate setting. Each session lasted approximately 60 to 90 min. With permission, all focus groups were audio-recorded using a digital recorder or Zoom's internal recording function.

2.2.3. Analytical Approach

The audio recordings were transcribed verbatim—both manually and using MAXQDA—then anonymized and analyzed using the reflexive thematic analysis approach outlined by Braun and Clarke [55] via the project team in Germany. This approach was used to help explore how female adolescents from Germany and Ghana experience the changes associated with puberty, what supports or strengthens them, and which challenges they encounter.

The six key phases of the reflexive thematic analysis [55], together with the specific procedures undertaken within each phase, are described below.

First, familiarization with the data was achieved through repeated listening to the audio recordings and multiple readings of the transcripts, during which initial ideas were noted. The focus group transcripts were independently reviewed by two groups of researchers for each country (in total 10), each group made up of two or three researchers, with each member examining the material individually to identify preliminary meanings prior to inductive coding. Second, initial coding was conducted across the dataset. Each transcript was systematically re-read to identify initial codes, defined as the most basic elements of the data relevant

to the research question. Each researcher independently generated a list of these codes. Third, the researchers collaboratively developed themes by analyzing the codes to identify meaningful patterns in how youth described their experiences. These patterns were organized into prospective candidate themes and subthemes through joint discussions between the two research groups. Fourth, the themes were reviewed and refined. This involved assessing their coherence and ensuring that the data within each theme demonstrated internal consistency while remaining clearly distinct from other themes. This step was supported through meetings involving all researchers, allowing themes to be collapsed, expanded, or reorganized as necessary. Fifth, themes were clearly defined and named. A thematic map illustrating the themes and subthemes was constructed, and final theme names were agreed upon through consensus among the researchers. Subsequently, the themes and subthemes were also discussed in a joint meeting with the Ghanaian cooperation partner to ensure contextual relevance and shared understanding. Finally, the reporting phase involved selecting illustrative participant quotes to support each theme. The outcomes of this phase are presented in the results section.

3. Results

3.1. Hypothesis Testing: Cross-Cultural Differences in the Evaluation of Puberty, Pubertal Bodily Changes, and Body Image

To test the hypothesis that German girls would report less positive evaluations of puberty and pubertal bodily changes than Ghanaian girls, initial unadjusted country comparisons were conducted using independent-samples *t* tests. Where Levene's test indicated unequal variances, Welch's *t* test was used. These initial comparisons were followed by ANCOVAs adjusting for age and sensitivity analyses restricted to girls who reported experiencing menarche to assess the robustness of the findings.

3.1.1. Puberty in General

A significant cross-cultural difference emerged in the general evaluation of puberty. German girls ($M = 0.17$, $SD = 1.11$, $n = 196$), $t(264.66) = 6.13$, $p < 0.001$, 95% CI [0.64, 1.25]) evaluated puberty less positively than Ghanaian girls ($M = 1.12$, $SD = 1.68$, $n = 160$). The effect size of $d = 0.68$ represents a medium-to-large effect.

3.1.2. Evaluation of Bodily Changes

Belly

In the unadjusted comparison, German girls evaluated pubertal changes in the belly more negatively ($M = -0.50$, $SD = 1.26$, $n = 194$), whereas Ghanaian girls reported near-neutral evaluations of belly changes ($M = -0.03$, $SD = 1.85$, $n = 210$). The difference was statistically significant, Welch's $t(370.90) = 3.02$, $p = 0.003$, 95% CI [0.16, 0.78], with an effect size of $d = 0.30$, indicating a small-to-medium effect.

Breasts

There was no significant difference between German girls ($M = 1.36$, $SD = 1.24$, $n = 194$) and Ghanaian ($M = 1.54$, $SD = 1.46$, $n = 209$) in their evaluation of breast development, Welch's $t(397.63) = 1.34$, $p = 0.182$, 95% CI [−0.09, 0.44], $d = 0.13$. Thus, overall, breast development was viewed relatively positively by adolescents in both cultural contexts.

Buttocks

German girls ($M = 0.91$, $SD = 1.22$, $n = 194$) reported slightly less positive evaluations on their buttocks' development during puberty than Ghanaian girls ($M = 1.17$, $SD = 1.72$, $n = 209$). However, this difference

did not reach statistical significance, Welch's $t(375.13) = 1.76$, $p = 0.079$, 95% CI [−0.03, 0.55], $d = 0.17$. Overall, changes in the buttocks were evaluated relatively positively in both cultural contexts.

Menstruation

The largest unadjusted country difference concerned the evaluation of menstruation. German girls ($M = -0.91$, $SD = 1.63$, $n = 192$) evaluated it negatively, whereas Ghanaian girls ($M = 1.35$, $SD = 1.84$, $n = 210$) evaluated menstruation positively. The difference was highly significant, Welch's $t(399.64) = 13.06$, $p < 0.001$, 95% CI [1.92, 2.60], with an effect size of $d = 1.30$, indicating a very large unadjusted effect.

3.1.3. Body Figure Rating

Perceived Body Shape

There was no significant difference in perceived current body shape between German girls ($M = 3.87$, $SD = 1.04$, $n = 196$), Welch's $t(379.39) = 1.50$, $p = 0.134$, 95% CI [−0.06, 0.44], $d = 0.15$, and Ghanaian ($M = 4.07$, $SD = 1.53$, $n = 215$). Mean scores in both groups were located near the center of the nine-point figure scale, suggesting that adolescents generally perceived their body shape as being within the average weight range.

Ideal Body Shape

However, German girls ($M = 3.15$, $SD = 0.76$, $n = 192$) reported a significantly thinner ideal body shape rating than Ghanaian girls ($M = 3.90$, $SD = 1.43$, $n = 208$), Welch's $t(320.70) = 6.61$, $p < 0.001$, 95% CI [0.53, 0.97], with an effect size of $d = 0.65$, reflecting a medium-sized unadjusted effect. While both groups preferred body shapes within the lower-to-average weight range of the figure scale, German girls endorsed a notably thinner body ideal than their Ghanaian peers.

Real-Ideal Discrepancy

German girls ($M = 0.71$, $SD = 1.07$, $n = 191$) showed a significantly larger discrepancy between perceived and ideal body shape than Ghanaian girls ($M = 0.17$, $SD = 1.14$, $n = 208$), Welch's $t(396.81) = -4.84$, $p < 0.001$, 95% CI [−0.75, −0.32], with $d = -0.48$, indicating a medium-sized unadjusted effect. Positive discrepancy scores in both groups indicate that adolescents generally perceived themselves as somewhat heavier than their ideal body shape; however, this discrepancy was markedly larger among German girls.

3.1.4. Age-Adjusted and Postmenarche Sensitivity Analyses

To determine whether the observed country differences could be accounted for by the higher mean age of the German sample, all eight outcomes were reanalyzed using ANCOVAs with age as a covariate. None of the country-by-age interactions reached statistical significance. Therefore, the reduced models containing the main effects of country and age were used for interpretation. Given unequal error variances between the countries for several outcomes, statistical inference was based on HC3 heteroscedasticity-consistent standard errors and confidence intervals.

After adjustment for age, German girls continued to evaluate puberty less positively overall than Ghanaian girls, adjusted mean difference = 1.15, HC3 SE = 0.18, 95% CI [0.80, 1.50], $p < 0.001$, $\eta_p^2 = 0.104$. The largest adjusted difference remained for the evaluation of menstruation, with Ghanaian girls evaluating menstruation more positively than German girls, adjusted mean difference = 2.05, HC3 SE = 0.24, 95% CI [1.58, 2.52], $p < 0.001$, $\eta_p^2 = 0.158$. German girls also selected a thinner ideal body shape than Ghanaian girls, adjusted mean difference = 0.67, HC3 SE = 0.11, 95% CI [0.46, 0.88], $p < 0.001$, $\eta_p^2 = 0.088$. Moreover, the real-ideal discrepancy was larger among German girls, adjusted mean difference =

−0.54, HC3 SE = 0.15, 95% CI [−0.82, −0.25], $p < 0.001$, $\eta_p^2 = 0.033$. These four country effects remained statistically significant after Holm correction across the eight outcomes.

After adjustment for age, the country differences in the evaluation of belly changes were not statistically significant ($p = 0.095$). The country difference in the evaluation of breast development reached nominal significance ($p = 0.032$), but did not remain significant after Holm correction. No age-adjusted country differences were observed for evaluations of buttocks changes or perceived current body shape.

The sensitivity analyses restricted to postmenarcheal girls produced the same overall pattern of results. Significant country differences remained for the general evaluation of puberty, adjusted mean difference = 1.12, HC3 SE = 0.20, 95% CI [0.73, 1.52], $p < 0.001$, $\eta_p^2 = 0.097$; evaluation of menstruation, adjusted mean difference = 1.98, HC3 SE = 0.27, 95% CI [1.45, 2.50], $p < 0.001$, $\eta_p^2 = 0.147$; ideal body shape, adjusted mean difference = 0.68, HC3 SE = 0.12, 95% CI [0.46, 0.91], $p < 0.001$, $\eta_p^2 = 0.102$; and the real-ideal discrepancy, adjusted mean difference = −0.61, HC3 SE = 0.15, 95% CI [−0.90, −0.31], $p < 0.001$, $\eta_p^2 = 0.050$. All four effects remained statistically significant after Holm correction.

No significant differences were observed in the postmenarche analyses for the evaluations of belly changes, breast development, buttocks changes, or perceived current body shape. Taken together, the main country differences in the general evaluation of puberty, the evaluation of menstruation, ideal body shape, and the real-ideal discrepancy were not explained by age or by the higher proportion of postmenarcheal girls in the German sample. Full results of the age-adjusted and sensitivity analyses are presented in Table 1.

Table 1. Age-adjusted country differences in the full sample and postmenarche sensitivity analyses.

Full Sample									
Outcome	**GH *n***	**GER *n***	**GH Adj. *M***	**GER Adj. *M***	**Diff. [95% CI]**	**HC3 SE**	***p***	**η_p^2**	**Holm**
Puberty in General	160	196	4.23	3.08	1.15 [0.80, 1.50]	0.18	<0.001	0.104	Yes
Belly	210	194	−0.07	−0.46	0.39 [−0.07, 0.85]	0.23	0.095	0.007	No
Breast	209	194	1.63	1.27	0.36 [0.03, 0.68]	0.17	0.032	0.011	No
Buttocks	209	194	1.14	0.94	0.21 [−0.19, 0.60]	0.20	0.311	0.003	No
Menstruation	210	192	1.25	−0.80	2.05 [1.58, 2.52]	0.24	<0.001	0.158	Yes
Real Body Shape	215	196	3.96	3.85	0.11 [−0.14, 0.36]	0.13	0.397	0.002	No
Ideal Body Shape	208	192	3.80	3.13	0.67 [0.46, 0.88]	0.11	<0.001	0.088	Yes
Real-Ideal Discrepancy	208	191	0.17	0.71	−0.54 [−0.82, −0.25]	0.15	<0.001	0.033	Yes
Postmenarche Sample									
Outcome	**GH *n***	**GER *n***	**GH Adj. *M***	**GER Adj. *M***	**Diff. [95% CI]**	**HC3 SE**	***p***	**η_p^2**	**Holm**
Puberty in General	115	173	4.25	3.12	1.12 [0.73, 1.52]	0.20	<0.001	0.097	Yes
Belly	152	174	−0.07	−0.54	0.47 [−0.06, 0.99]	0.27	0.083	0.009	No
Breast	152	174	1.64	1.30	0.34 [−0.01, 0.69]	0.18	0.058	0.011	No
Buttocks	152	174	1.08	0.96	0.12 [−0.32, 0.57]	0.23	0.588	0.001	No
Menstruation	151	172	1.17	−0.80	1.98 [1.45, 2.50]	0.27	<0.001	0.147	Yes
Real Body Shape	151	173	4.00	3.94	0.06 [−0.22, 0.33]	0.14	0.680	0.001	No
Ideal Body Shape	144	170	3.80	3.12	0.68 [0.46, 0.91]	0.12	<0.001	0.102	Yes
Real-Ideal Discrepancy	144	169	0.21	0.82	−0.61 [−0.90, −0.31]	0.15	<0.001	0.050	Yes

Note: Adj. *M* = adjusted mean; Diff. = mean difference (Ghana − Germany); GH = Ghana; GER = Germany; Holm = significant after Holm correction. Adjusted means were estimated at the mean age of participants included in each model. Positive mean differences indicate higher scores among Ghanaian girls; negative mean differences indicate higher scores among German girls. Confidence intervals and *p* values are based on HC3 heteroscedasticity-consistent standard errors. η_p^2 = partial eta squared.

3.2. Research Question 1: How Do German and Ghanaian Girls Differ in Their Perceptions of Puberty?

3.2.1. Qualitative Open-Ended Survey Results

Responses to the open-ended item 'Puberty is...negative/positive, why?' were subjected to qualitative analysis. Intercoder reliability between the two coders was high (Germany: $\alpha = 0.80$; Ghana: $\alpha = 0.83$), indicating reliable agreement. Three themes emerged from the responses for each country.

German Girls Perceptions of Puberty

Change (both in general and in relation to the body; mostly viewed negatively) was the overarching theme in German girls' interpretations of puberty: 'Because you change and other people don't understand that'. A further dominant theme in the German sample was the notion of growing up or maturing: 'because you become more mature and prepare yourself for future life'. The third recurring theme among German girls was the perception of puberty as exhausting or annoying: 'is no fun and annoying'.

Ghanaian Girls Perceptions of Puberty

Maturation and the transition to adulthood were the first themes to emerge in the Ghanaian girls' responses: 'Because it makes you know that you are becoming an adult and that you are no more a child'. The second theme in the Ghanaian sample emphasized change (viewed positively): 'It shows the physical, emotional, and psychological change in a person'. A further theme among the Ghanaian adolescents related to becoming a woman, reaching fertility, and preparing for marriage: 'Well, it's positive because it will enable me to give birth. And giving birth is actually a good thing'.

Cross-Cultural Differences in Perceptions of Puberty

German girls tended to frame puberty as a challenging process marked by change, uncertainty, and annoyance, whereas Ghanaian girls more often emphasized maturation, positive development, and womanhood.

3.3. Research Question 2: How Do German and Ghanaian Girls Navigate Pubertal Changes?

3.3.1. Qualitative Results: Focus Groups

Two focus group discussions (one in Germany, one in Ghana) were conducted to explore girls' perceptions of puberty and body image more in depth. The analysis revealed both shared and context-specific themes. While participants in both groups discussed pubertal changes and related uncertainties, differences emerged in how these experiences were interpreted, socially negotiated, and supported.

German Girls' Experiences of Navigating Puberty

Girls from Germany discussed puberty primarily as an individual developmental process shaped by internal experiences and peer dynamics. Six overarching themes were identified: pubertal changes, uncertainties, self-image, social comparisons, sources of influence, and social conflicts.

Ghanaian Girls' Experiences of Navigating Puberty

Girls from Ghana discussed puberty more explicitly within a social and relational context. Six main themes emerged: pubertal changes, uncertainties (due to pubertal changes), a trusted person for puberty-related questions, specific body ideal, comparison (appearance), and judgment (appearance).

3.3.2. Cross-Cultural Differences and Similarities Navigating Puberty

Girls in both countries reported social comparison, appearance concerns, and emotional changes during puberty. However, German girls emphasized individual experiences and peer dynamics, whereas Ghanaian girls discussed puberty more strongly with reference to their social, relational, and community contexts.

The themes per country and their corresponding subthemes, including related quotes, are presented in Table 2.

Table 2. Themes, subthemes and related quotes from German and Ghanaian girls.

German Girls		
Themes	**Subthemes**	**Quotes**
Pubertal changes	Emotional changes (e.g., mood swings)	"And it's always like that, one moment you're really happy and the next moment you're already crying again".
	Physical changes	"I would say your hips, simply. You get a feminine body".
Uncertainties regarding appearance	Skin problems	"Well, I can say that I struggle a lot with bad skin, like pimples and blemishes. [...] Why do I look like this? Why do I have skin like this?".
	Dissatisfaction with body	"We were working with different classes and then suddenly some really thin people came in. Really muscular. And then I felt a bit small and somehow a bit fatter. And that doesn't happen to me very often. But at that moment, I somehow felt that way".
Self-image	Naturalness	"I think I'm just normal and have a beautiful body".
	Sense of maturity	"So that you realize to yourself that you are now becoming a woman and are no longer a child".
Social comparisons	Physical comparisons	"The ones you see every day, compare yourself to, but you also compare yourself a lot to people on the internet, where everything isn't necessarily always the way it really is. I mean, there are a lot of things that don't really correspond to reality".
	Comparisons of lifestyles	"It inspires me when others can lead a regular daily life, when they can eat healthily, but also do sports to balance things out, and then still manage their appointments and juggle school and homework, and still be able to cope with the pressure of school and grades and everything else, and try to [...]".
	Evaluation of appearance by others	"and either you're a jellyfish, as many people say, or a stick".
Sources of influence	Social media	"Well, sometimes on social media, I see girls who are older or exactly my age and who have nice hips and flat stomachs".
	Role models	"Mostly with my mom and often with friends".
Social conflicts	Problems with parents, friends, school	"So first of all, there are lots of problems [...] and then you often get problems with your parents, friends, and school".
	Girls judge their own appearance more harshly	"I think girls tend to be more concerned about how they look".
	Boys express their opinions more directly than girls.	"Yes, it's a bit stronger, but the boys say so too, quite clearly. But you are very overweight, aren't you?".
Ghanaian Girls		
Themes	**Subthemes**	**Quotes**
Pubertal changes	Normal process	"It's normal". "Undergoing a transition from childhood to adulthood". "Seeing a development in your body from age 10 to 19".
	Physical changes (sometimes negative, e.g., cramps)	"Having pubic hair". | "Development of the breasts". | "The cramps".
	Emotional changes & Independence	"I've seen an emotional change… It`s like having mood swings". "Because one day, no one will be there to be able to help you".

Uncertainties (due to pubertal changes)	Anxiety of further pubertal changes	"It will get worse in the future, so just go through it".
	Regret/warning about early sexual intercourse	"Avoiding sexual intercourse".
	Feeling unwelcome/unaccepted	"Or I feel like I'm not wanted in a certain area. Like how some people are, so I just distance myself".
	Feeling uncomfortable	"When you getting your period, the cramps make you feel uncomfortable".
Trusted person for puberty-related questions	Mother	"My mother".
	Some teachers	"It depends on the teacher. But there are some teachers that you can speak to about these things".
Specific body ideal	Rounder figure—flat stomach	"Small waist". | "The flat tummy". | "Thick, not fat". | "The hips".
Comparison (appearance)	Comparing of self to others in real life and online	"I compare myself". | "Rarely on social media, but the ones I'm close with, I do it every day". "Different people, friends". | "Peers...Just a few people".
Judgement (appearance)	Being judged by others in real life (peers, parents, teachers)	"She [Friend] says I'm shapeless". "Even my mother. But as a joke. She says I'm flat and that I take after her". "they [Teachers] call you skinny".
	Judging others in real life (peers) and online	"They'll be wearing dresses that are not decent. Exposing their bodies".

4. Discussion

The present mixed-methods study investigated how female adolescents in Germany and Ghana evaluate puberty and pubertal bodily changes, and how these evaluations are embedded in broader body image perceptions and sociocultural contexts. By integrating standardized survey data with open-ended responses and focus group discussions, the findings provide a differentiated understanding of similarities and differences in girls' pubertal experiences across two cultural contexts. The results reveal that, (1) German female adolescents evaluated puberty less positively than Ghanaian female adolescents, and reported a more negative personal evaluation of menstruation, whereas country differences in other pubertal bodily changes were small or not robust across adjusted and sensitivity analyses; (2) Ghanaian female adolescents regularly alluded to religious, marriage and motherhood themes when discussing puberty, suggesting that pubertal development is embedded within broader culturally meaningful narratives of womanhood and maturity; and (3) German female adolescents reported a thinner ideal body shape and greater real-ideal discrepancy between their perceived and ideal body image, while not differing in their actual body shape from their Ghanaian peers, pointing toward the influence of thin-ideal norms and social comparison processes.

4.1. Cross-Cultural Differences in the General Evaluation of Puberty

A central finding of the quantitative survey was that German female adolescents evaluated puberty significantly more negatively than their Ghanaian peers, with a medium-to-large effect size. This difference was strongly corroborated by the qualitative findings. In the open-ended survey responses, German females frequently described puberty as "annoying", "exhausting", or characterized by unwanted changes and misunderstandings. In contrast, Ghanaian females more often framed puberty as a meaningful developmental transition, emphasizing maturity, becoming a woman, and even future motherhood.

The focus group data further contextualized these patterns. German participants predominantly associated puberty with emotional turbulence, social conflicts, and appearance-related insecurities. In contrast, Ghanaian participants more frequently described puberty as a "normal process" and a transition from childhood to adulthood, reflecting an integrative and developmentally embedded understanding. These findings suggest that puberty may be culturally framed either as a disruptive and challenging phase (Germany) or as a socially meaningful and anticipated developmental milestone (Ghana). From the perspective of the Contextual Amplification Hypothesis [33], pubertal experiences are shaped not only by biological maturation itself but also by the sociocultural contexts in which adolescents interpret these bodily changes. Cultural narratives surrounding femininity, maturity, and social roles may therefore amplify either positive or negative experiences of puberty. From a developmental-cultural perspective, these differences may reflect variations in socialization practices, gender norms, and societal narratives surrounding femininity and maturation. In Germany, where individual self-optimization and appearance-related pressures may be more salient, puberty might be more strongly associated with stress, self-consciousness, and self-doubt. In Ghana, puberty appears more closely linked to culturally valued roles such as womanhood and fertility, potentially fostering a more positive appraisal. These differences may also reflect broader cultural value systems. German society is characterized by a stronger emphasis on individual autonomy, personal achievement, and self-development, whereas Ghanaian society has been described as emphasizing collectivistic values, including social connectedness, interdependence, and the fulfillment of family and community expectations [67–69]. Such differences in cultural values may shape how bodily changes are interpreted and evaluated during adolescence, influencing whether puberty is perceived primarily as a marker of social maturity and belonging or as a source of individual pressure and self-evaluation. These interpretations are consistent with previous developmental research suggesting that pubertal adjustment is strongly influenced by adolescents' social environments, culturally shared

expectations regarding gender and bodily development, and broader cultural value systems [69–71]. The present findings are further consistent with cross-cultural body image research demonstrating that adolescents of the Global North are more strongly exposed to thin-ideal norms and appearance-based social comparison processes, particularly through peer and media influences [72,73], whereas adolescents in many Global South cultural contexts may experience bodily maturation within more collectively embedded and socially integrative developmental frameworks [74,75]. Importantly, the country difference in the general evaluation of puberty remained significant after adjustment and in analyses restricted to postmenarcheal girls. This suggests the robustness of the findings, *i.e.*, that the less positive evaluation of puberty among German girls is independent of age and the actual experience of menarche, and stresses the cultural influence on the personal perceptions of puberty in girls. The findings also align with previous research reporting less positive evaluations of puberty among German than Ghanaian female adolescents [7]. In that study, German female adolescents more frequently highlighted burdensome aspects of the transition, including menstruation, mood fluctuations, physical appearance concerns, and the need to adapt to new challenges, whereas Ghanaian females predominantly interpreted puberty as a natural and meaningful developmental milestone linked to growth, adulthood, and positive self-development, suggesting culturally distinct meanings attached to pubertal change.

4.2. Evaluation of Specific Bodily Changes

Cross-cultural differences were particularly pronounced in girls' personal evaluation of menstruation. German female adolescents evaluated menstruation negatively, whereas Ghanaian females evaluated it positively, with a very large difference and effect size. This striking divergence is noteworthy, as menstruation is often reported as stigmatized or associated with discomfort in many cultural contexts [76,77]. In the present data, German female adolescents' more negative evaluation of menstruation may reflect a stronger discomfort-focused or taboo-oriented discourse surrounding menstruation, potentially compounded by concerns about inconvenience, pain, bodily shame, or social embarrassment. By contrast, however, Ghanaian female adolescents appeared to integrate menstruation into a broader, positively connoted narrative of maturation and fertility, consistent with qualitative responses referencing womanhood and the ability to give birth. Although Ghanaian focus group participants also mentioned menstrual cramps and physical discomfort, these experiences were embedded in an overarching narrative of normality, growth, and developmental progression rather than rejection. Notably, this positive framing emerged despite less consistent access to comprehensive puberty education than is typically available in Germany, suggesting that sociocultural meanings attached to bodily changes may be more influential for pubertal evaluations than knowledge provision alone [7,33].

Menstruation represents a particularly salient aspect of female pubertal development that is strongly shaped by cultural beliefs and practices. Cross-culturally menstruation functions as a meaningful marker of maturity, femininity, and reproductive capability in certain sociocultural contexts [78], as evidenced by the current findings. However, evidence also suggests that menstrual stigma and secrecy can negatively affect female adolescents' psychological well-being, school participation, and body image [44,77]. For instance, although the onset of menarche is traditionally celebrated as a transition to womanhood in Ghana, menstruation continues to be socio-culturally perceived as unclean and associated with various taboos, including restrictions and prohibitions in the use of household and communal resources such as religious spaces [51], thereby contributing to menstrual stigma and disruptions in educational participation [79]. The present findings suggest that the Ghanaian adolescents may interpret menstruation less as an individual burden and more as a culturally meaningful transition into womanhood and fertility. From a developmental-cultural perspective, these findings may reflect broader societal narratives surrounding female bodily development and menstrual normalization.

For breasts and buttocks, no robust country differences emerged. Although the age-adjusted analysis indicated a nominal country difference for breast development, this effect did not remain significant after Holm correction and was not reproduced in the postmenarche sensitivity analyses—likewise, the evaluation of belly. However, both groups evaluated breast development relatively positively, likely reflecting its association with femininity and adult womanhood, which is appreciated in girls in both samples [80]. Taken together, besides these similar reflections of breast development, other findings suggest that cross-cultural differences were not generalized across all pubertal bodily changes. The most pronounced difference, however, emerged for menstruation.

4.3. Body Ideals and Real-Ideal Discrepancy

Although perceived current body shape did not differ significantly between groups, German female adolescents reported a significantly thinner ideal body shape and a larger real-ideal discrepancy than Ghanaian female adolescents. This suggests that body dissatisfaction may be more pronounced among German female adolescents, even when girls' perceived current body shape is broadly comparable across both cultures.

The qualitative data support this interpretation. German focus group participants frequently described appearance-related comparisons, exposure to social media images, and explicit peer judgments (e.g., being labeled a "jellyfish" or "stick"). They also reported comparing themselves to idealized online figures and high-performing peers, for instance during sports lessons at school. These narratives indicate a social comparison climate strongly shaped by mediated and peer-based appearance standards. In contrast, Ghanaian female adolescents articulated a culturally specific body ideal characterized by a "small waist", "flat tummy", and being "thick, not fat". While appearance comparisons and judgments were also reported, these were more often embedded in close social relationships (friends, family, teachers) rather than heavily mediated by social media. Moreover, despite some reports of being judged as "shapeless" or "skinny", the overall tone remained more accepting of bodily development as a natural aspect of maturation, although participants also described appearance-related evaluations and exposure to competing body ideals.

Taken together, these findings suggest that the larger real-ideal discrepancy among German female adolescents may reflect stronger internalization of thin-ideal norms and intensified upward social comparison processes, particularly via social media. These results also refer to broader societal level differences on what constitutes an ideal body for women. In contrast to the thin ideal that predominates in many societies from the Global North and is associated with attractiveness and self-worth [72,73,81], fuller body figures in many African cultural contexts, including Ghana, are traditionally associated with health, beauty, fertility, prosperity, and social status [46,82]. Although globalization and social media increasingly expose adolescents to beauty standards that prevail in the Global North, culturally specific body ideals appear to persist alongside increasing exposure to Global North beauty standards, suggesting that Ghanaian adolescents negotiate multiple and sometimes competing appearance norms [75].

4.4. Uncertainties, Social Contexts, and Sources of Support

Both groups described emotional changes and mood swings, indicating that affective fluctuations are a shared developmental experience. However, the contextual framing differed. German female adolescents emphasized social conflicts (with parents, peers, and school) and heightened self-criticism, which is consistent with research linking pubertal development in Global North contexts to increased self-consciousness, interpersonal stress, and emotional vulnerability [71]. Ghanaian females expressed uncertainties regarding future changes and cautions about early sexual intercourse, reflecting a moral and protective discourse around puberty. Such concerns may also reflect the broader cultural and religious norms surrounding sexuality that have been described in the Ghanaian context, and that may shape how

puberty-related information is communicated. These findings align with research suggesting that adolescent sexuality in many African contexts is more strongly embedded within family expectations, moral guidance, and community norms [43,83].

Notably, Ghanaian female participants, in contrast to their German counterparts, explicitly identified trusted persons—especially mothers and some teachers—for puberty-related questions. Previous research has highlighted the potential importance of maternal guidance and intergenerational communication for female adolescents' pubertal experiences and menstrual attitudes [44,77]. However, these findings should be interpreted alongside evidence that access to puberty-related information remains uneven and that cultural and religious taboos may constrain discussions of sexuality in some Ghanaian contexts.

These differences may indicate varying degrees of individual versus collective coping frameworks. In Germany, adolescents may rely more heavily on peer and media-based information environments. In Ghana, puberty may be embedded more strongly within family and intergenerational relationships, with mothers and teachers serving as important sources of guidance for some adolescents. However, the availability and openness of such communication likely vary across socioeconomic, religious, and community contexts. This interpretation is consistent with cross-cultural developmental research emphasizing that adolescents' experiences of bodily maturation are shaped by culturally embedded socialization processes and locally shared models of coping and identity development [84,85].

Taken together, the present findings support a contextualized understanding of pubertal experiences and are broadly consistent with the contextual amplification perspective. While German female adolescents frequently described puberty as a period of heightened exposure to appearance-focused norms and social comparison processes, Ghanaian females characterized it as a more socially embedded and normative developmental transition, shaped by the interplay of supportive family relationships, cultural expectations, and structural constraints. These findings suggest that the meaning and consequences of pubertal development depend less on biological change itself than on the cultural and social environments in which these changes are interpreted.

5. Strengths, Limitations, and Future Directions

A major strength of the present study lies in its convergent mixed-methods design, which enabled the integration of quantitative findings with qualitative insights. By combining these two methods, the study captured both measurable cultural differences and the subjective meanings adolescents attribute to pubertal experiences, thereby enriching the findings while allowing for triangulation across multiple data sources. Importantly, the qualitative findings converged with the main quantitative patterns, thereby strengthening the overall validity and interpretability of the study. Although the German and Ghanaian adolescents showed differences in their framing of puberty, across both contexts, they reported shared experiences, including emotional volatility, heightened awareness of peer judgments, and appearance-related comparisons. This suggests that although puberty represents a universal developmental transition, its personal interpretation and emotional significance for girls are strongly shaped by sociocultural influences. Furthermore, the use of focus groups strengthened the qualitative component of the study. As a semi-structured method, focus groups are well-suited for adolescent research, as peer interaction can encourage open discussion and reveal both consensus and contradictions in participants' perspectives [66], thereby providing valuable contextual insights that complement the quantitative findings.

Furthermore, the study contributes to cross-cultural developmental research by conceptualizing puberty as a simultaneously biological, psychological, and sociocultural process [10]. In the context of globalization and digital connectivity, adolescents are increasingly exposed to diverse norms and body ideals through social media and online interactions [86]. Consequently, narratives surrounding puberty may increasingly intersect and evolve, underscoring the importance of considering both traditional and contemporary influences on adolescent development. This perspective is supported by evidence that

adolescents spend a large proportion of their leisure time engaging in digital activities, highlighting the growing relevance of online environments in shaping developmental experiences [87].

Despite these strengths, several limitations should be acknowledged. First, the cross-sectional design precludes causal conclusions regarding the relationships between cultural context, puberty evaluations, and body image development. Longitudinal research is therefore needed to examine how these experiences evolve over time and whether positive framings of puberty may serve as protective factors against later body dissatisfaction or psychological distress. Second, although the sample size was substantial, participants were only recruited from urban areas in Germany and Ghana, which may limit the generalizability of the findings. Future studies should therefore examine within-country variation, including urban-rural differences and socioeconomic influences. In addition, schools in both countries were recruited through established institutional networks, and participation required prior parental consent and student assent. As a result, questionnaire completion among eligible students was effectively high complete, but no information was available on students who did not return consent forms or who were otherwise not included, e.g., due to sickness on the day of data collection. Accordingly, potential self-selection or non-response effects cannot be ruled out. These procedures were necessary in view of the school-based design and ethical requirements for research with minors, but they may have resulted in samples that are not fully representative of the broader student populations in the two study contexts. Third, the reliance on self-report measures may have introduced social desirability bias or culturally specific response tendencies. However, given the study's focus on female adolescents' personal perceptions and reflections on puberty, self-reports were necessary to capture these subjective experiences directly. As such, the potential for response bias should be considered when interpreting the findings. More broadly, pubertal development should be understood within an ecological framework that includes not only sociocultural influences but also biological and environmental conditions. Although the present study focused on subjective evaluations of puberty and body image, future research could more explicitly examine how contextual factors such as nutrition, health conditions, environmental stressors, and other ecological influences intersect with cultural meaning systems in shaping pubertal experiences.

Future research should broaden the cultural scope of investigation and include male adolescents in order to provide a more comprehensive understanding of the gendered and sociocultural dynamics of pubertal development. In addition, further research examining the role of social media exposure, globalization, and shifting beauty ideals may offer valuable insights into how contemporary adolescents navigate pubertal transitions across different sociocultural settings.

Consistent with recommendations that effective puberty education should be multimodal, extend beyond the communication of biological knowledge, address emotional and interpersonal challenges, and be responsive to the needs of diverse cultural groups [13], interventions should address the emotional, social, and cultural dimensions of pubertal development, including body image concerns, social comparison processes, societal gender norms, and the everyday realities of menstruation. In particular, the findings point to the importance of addressing appearance-related pressures and menstruation-related challenges among German female adolescents. Promoting supportive communication within families, particularly between mothers and daughters, fostering diverse and realistic body ideals, normalizing menstruation as a healthy developmental process, and encouraging positive narratives around puberty may facilitate healthier psychosocial adaptation and enhance (female) adolescents' confidence and well-being during this critical developmental period.

6. Conclusions

Overall, the findings demonstrate that puberty is not only a universal biological transition but also a culturally shaped psychosocial experience. While German female adolescents in this study more often associated puberty with emotional distress, appearance-related concerns, and pressures arising from social

comparison, Ghanaian female adolescents predominantly described it as a positive and meaningful transition into adulthood and womanhood. The findings further indicate that increasing globalization and shared exposure to digital media do not necessarily homogenize adolescents' experiences of puberty. Even among urban, school-attending girls who may be exposed to overlapping transnational media environments, puberty remained embedded in culturally specific meanings, social expectations, and body ideals. Differences in body ideals and greater real-ideal body discrepancies further underscore the relevance of culturally specific beauty standards and appearance norms for adolescents' experiences of pubertal development in Germany and Ghana.

Statement of the Use of Generative AI and AI-Assisted Technologies in the Writing Process

During the preparation of this manuscript, the authors used ChatGPT to refine sentence structure and improve clarity. The intellectual content, ideas, and conclusions are entirely those of the authors, and appropriate citations were added where relevant. The authors reviewed and edited the content as needed and take full responsibility for the published article.

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Author Contributions

Conceptualization and Design: N.F. and K.W.; Data Collection: N.F., K.W. and S.M.; Data Analysis and Initial Draft Preparation: N.F.; Editing and Review: K.W. and S.M. All authors read and approved the final manuscript.

Ethics Statement

This study was performed in line with the principles of the Declaration of Helsinki. The questionnaire and methodology for this study was approved by the Ethics Committee of the Faculty of Social and Behavioral Sciences of the University of Jena (Ethics approval number: FSV 23/025; Date of approval: 26 April 2023).

Informed Consent Statement

Written informed consent was obtained from the parents or legal guardians of all minor participants, and age-appropriate assent was obtained from the adolescent participants before their participation in the questionnaire survey and focus group discussions. The authors have retained the relevant consent and assent records.

Data Availability Statement

The datasets analyzed during the current study are available from the corresponding author on reasonable request.

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Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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