

Patterns of Exposure to AI-Based Applications in Children: Evidence from Parent-Reported Use and Human-Centered Implications

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Abstract– *The growing integration of artificial intelligence (AI)-based applications into everyday contexts has extended their use to the family environment, where technological adoption is often mediated by responsible adults. The present study analyzed parental perceptions of the use of AI-based applications, incorporating contextual information about the usage scenarios reported by parents. A cross-sectional observational design was used, employing a self-administered online questionnaire applied to 303 parents residing in Honduras. Parental perception was assessed using a six-item Likert scale, while the age of the children and the type of AI-based application were used for descriptive and contextual purposes. Analyses included descriptive statistics, Welch's analysis of variance, and latent profile analysis (LPA). The results showed a moderate overall perception of the impact of using AI applications, with no significant differences based on the gender of the participants, but with relevant variations based on the age group of the parents. The LPA identified three distinct profiles of parental perception: low, moderate, and high perceived impact, suggesting heterogeneous configurations of technological acceptance. These findings highlight the role of parents as key mediators in the adoption of intelligent systems and underscore the importance of considering human and perceptual factors in the design of AI-based applications. The implications of the study are relevant for the development of user-centered technological solutions that are sensitive to family contexts.*

Keywords– *Artificial intelligence; technology adoption; parental perception; human-application interaction; AI-based applications.*

INTRODUCTION

The adoption of artificial intelligence (AI)-based applications in everyday, consumer-oriented contexts has become a growing phenomenon, driven by the integration of intelligent systems into daily activities such as communication, entertainment, content personalization, and functional assistance. In these environments, the acceptance of AI does not depend exclusively on its technical performance, but on a set of perceptual, attitudinal, and contextual factors that influence users' willingness to incorporate these technologies into their daily lives. The literature on technology adoption has identified that variables such as trust in AI, fear of technology, and attitudes toward innovation can segment users into different acceptance profiles, with direct implications for the use and continuity of these applications [1].

Classic models of technology adoption, such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT), have consistently emphasized the role of perceived usefulness and ease of use as central determinants of the adoption of new technologies, including AI-based systems [2]. However, more recent research suggests that these models should be complemented by variables related to perceived autonomy, algorithmic transparency, and the explainability of automated decisions, particularly in applications that interact directly with users. When AI systems make decisions without offering understandable explanations, users may experience a loss of perceived control and reactance responses, reducing technology acceptance [3].

From a human-AI interaction perspective, transparency and clear communication about how intelligent systems work have been identified as fundamental principles for building trust. The ability to understand, at least at a general level, how and why an AI-based application acts in a certain way helps to reduce perceived complexity and strengthen willingness to continue using it [3], [4]. Complementarily, personal technological innovation and a positive attitude toward AI have been identified as robust predictors of adoption, as users who are more open to technology tend to more easily normalize the presence of intelligent systems in their everyday environment [5].

The acceptance of AI is also influenced by sociodemographic and sociocultural factors. Previous studies have shown that age, previous technological experience, and generational affiliation are associated with differences in attitudes toward technology, with a greater willingness to adopt it among younger generations, such as Millennials and Generation Z, who tend to act as drivers of innovation in emerging economies [6]. Likewise, cultural values and the influence of the social environment modulate the way users evaluate intelligent systems, interacting with variables such as gender and age to shape different patterns of acceptance [7].

In domestic contexts, the adoption of AI-based applications takes on an additional layer of complexity, as the use of these technologies is often mediated by responsible adults. Parental perception emerges as a key factor in the regulation, acceptance, and continued use of AI applications in family environments. Evidence indicates that parental awareness of the benefits and limitations of AI significantly influences their willingness to allow its use, with parents being more favorable when they have greater information and literacy in AI [8], [9]. Similarly, positive attitudes driven by utilitarian and hedonic motivations have been associated with greater adoption of AI-based applications in the family environment [10].

Parental mediation plays a central role in this process. Active mediation, characterized by guidance, dialogue, and informed supervision, has been linked to higher levels of trust in AI and a reduction in negative perceptions associated with these technologies, while restrictive approaches tend to have limited effects on acceptance and continued use [11]. In addition, family functioning and the quality of interactions within the home have been linked to higher levels of interest and trust in intelligent systems, creating environments more conducive to technology adoption [12].

However, alongside the perceived benefits, parents also express significant ethical concerns, particularly in relation to data privacy, information security, and algorithmic bias. These concerns can act as both facilitators and barriers to adoption, depending on the perceived degree of control, transparency, and human oversight in AI-based applications [13], [14]. In this regard, the perceived value of the technology, including features such as personalization, smart control, and alignment with family needs, is a central element in parental acceptance and continued use of these applications [15], [16].

Recent literature has also highlighted the existence of different profiles of parental perception of AI. Empirical studies have identified groups of parents with positive, neutral, and negative attitudes toward the use of smart technologies, suggesting a perceptual heterogeneity that is relevant for understanding technology adoption in family contexts [17]. Similarly, research based on segmentation analysis has revealed the presence of multiple adoption profiles based on different combinations of motivations and expectations, reinforcing the need for analytical approaches that capture this diversity [10].

In this context, the present study aims to analyze patterns of exposure to AI-based applications reported by parents, as well as parental perceptions associated with such use, from a perspective focused on technology adoption and human-application interaction. Using latent profile analysis, we seek to identify distinct configurations of parental perception and explore how contextual variables, such as parent age and reported usage scenarios, relate to the acceptance of AI-based applications in family settings.

MATERIALS AND METHOD

An observational, cross-sectional, self-report study was conducted to analyze patterns of parental perception regarding the use of artificial intelligence (AI)-based applications in family contexts. The unit of analysis consisted of adult parents, while the age of the child and the type of AI-based application reported served as contextual variables for interpreting these perceptions.

Participants and data collection procedure

The sample consisted of 303 adults residing in Honduras, selected through non-probability convenience sampling. The inclusion criteria were: (a) being 18 years of age or older, (b) being the parent of at least one child, and (c) completing the entire questionnaire. Incomplete, duplicate, or implausible responses were excluded as part of a data cleansing process prior to data analysis.

The information was collected using a self-administered online questionnaire, implemented through Google Forms. The access link was unique and was disseminated through the university's institutional social networks, researchers' personal contacts, and widely used social media platforms, including Facebook, Instagram, and WhatsApp. Participation was voluntary and anonymous, and the data was collected at a single point in time.

Study instrument and variables

Parental perception of the impact of AI-based app use on children was assessed using the Parental Perception Scale on the Impact of Artificial Intelligence App Use on Children, consisting of six items (P1–P6). The items were answered on a four-point Likert scale, with anchors ranging from 1 = strongly disagree to 4 = strongly agree. No reverse items were used.

The total score on the scale was calculated as the arithmetic mean of the six items, generating a continuous indicator of parental perception, where higher values reflect a greater perception of the impact of AI-based application use. Additionally, basic sociodemographic variables were collected, including the parent's gender and age group, as well as contextual information on the child's age (ordinal categories) and the types of AI-based applications reported to be used by parents. The latter were operationalized dichotomously (use vs. non-use) and were used exclusively for descriptive and contextual purposes.

Instrument validation

The Parental Perception Scale on the Impact of the Use of Artificial Intelligence Applications on Children underwent a psychometric validation process prior to the main analyses. The internal consistency of the scale was evaluated using Cronbach's alpha coefficient, obtaining a value of $\alpha = .815$, which indicates good internal reliability. Complementarily, McDonald's omega coefficients showed values consistent with alpha, supporting the homogeneity of the instrument's internal structure. Item-total analysis showed that all items contribute adequately to the scale, with no item removal producing substantive improvements in overall reliability.

Construct validity was initially examined using exploratory factor analysis (EFA), employing the least squares method with oblique rotation (oblimin). The suitability of the data for factor analysis was confirmed by a Kaiser–Meyer–Olkin (KMO) index = 0.865, considered very good, and a significant Bartlett's sphericity test ($\chi^2 (15) = 712, p < .001$). The EFA results supported a unidimensional structure, with factor loadings ranging from .396 to .996 and acceptable levels of uniqueness in most items.

Subsequently, a confirmatory factor analysis (CFA) was performed to evaluate the adequacy of the identified unifactorial model. All standardized factor loadings were significant ($p < .001$), with moderate to high magnitudes ($\lambda = .587-.917$). The overall fit indices indicated a good fit of the model, with values of CFI = .973, TLI = .955, and RMSEA = .084 (90% CI [.050, .120]), considered acceptable given the characteristics of the model and the small number of indicators. Overall, these results support the factorial validity and reliability of the instrument for use in the present study.

Statistical analysis

Statistical analyses were performed using Jamovi software, version 2.7.12.0. First, descriptive analyses based on frequencies and percentages were performed for categorical and ordinal variables, as well as measures of central tendency and dispersion for the total scale score.

To examine differences in parental perception according to the gender and age group of participants, one-way analysis of variance with Welch's correction was applied, given the nature of the data and the possible violation of the assumption of homogeneity of variances. When statistically significant differences were detected, post hoc comparisons were performed using the Games–Howell method. Homogeneity of variances was assessed using Levene's test.

In addition, a latent profile analysis (LPA) was conducted to identify underlying configurations of parental perception based on the six items of the scale. Solutions with different numbers of profiles were compared, and the final model was selected based on a set of fit criteria, including AIC, BIC, SABIC, CAIC, CLC, KIC, and entropy value. The selected solution prioritized parsimony, classification quality, and substantive interpretability of the profiles.

There were no missing data in the final analytical database, as incomplete responses were excluded before the analyses began. All statistical tests were evaluated with a significance level of $\alpha = 0.05$.

RESULTS

Characterization of the sample

The analytical sample consisted of 303 parents, of whom 121 were men, 180 were women, and 2 participants indicated that they preferred not to answer. The distribution by age group,

presented in Table 1, was analyzed exclusively by frequencies and percentages, given the ordinal nature of the age variable.

The largest proportion of participants was concentrated in the 25–34 and 35–44 age ranges, which together represented 48.8% of the total sample. Within these groups, there was a higher representation of women, particularly in the 35–44 age range (20.5% of the total), followed by the 25–34 age group (19.5%). In contrast, men were relatively more concentrated in the 45–54 age group, which accounted for 15.2% of the total sample, making it the largest male age group.

TABLE 1
DESCRIPTIVE STATISTICS OF PARENTAL AGE BY SEX

Age group	Men, n (%)	Women, n (%)	Prefer not to answer, n (%)	Total, n (%)
18–24	9 (3.0)	18 (5.9)	1 (0.3)	28 (9.2)
25–34	20 (6.6)	59 (19.5)	1 (0.3)	80 (26.4)
35–44	25 (8.3)	62 (20.5)	0 (0.0)	87 (28.8)
45–54	46 (15.2)	24 (7.9)	0 (0.0)	70 (23.1)
55–64	16 (5.3)	16 (5.3)	0 (0.0)	32 (10.6)
≥65	5 (1.7)	1 (0.3)	0 (0.0)	6 (2.0)
Total	121 (39.9)	180 (59.4)	2 (0.7)	303 (100)

Note. Percentages are calculated over the total sample (N = 303). Age was measured using ordinal categories.

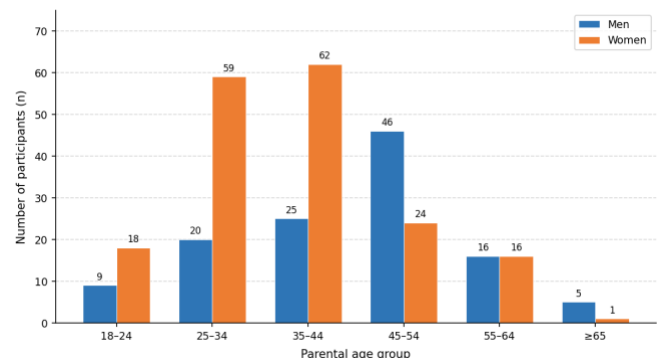


Figure 1. Distribution of parents by age group and sex (N = 303).

The extreme age ranges were underrepresented. Participants aged 18–24 and those aged 65 or older together made up less than 10% of the sample, for both men and women. Cumulatively, approximately 80% of participating parents were between the ages of 25 and 54, making it a predominantly adult sample.

Parental perception of the use of AI applications in children

The total score on the parental perception scale regarding the impact of the use of AI-based applications on children was calculated from the six items that comprise it (P1–P6). As shown in Table 2, the scale had a mean score of $M = 2.47$ ($SD = 0.83$), with a 95% confidence interval between 2.38 and 2.57.

The median observed was 2.67, indicating a concentration of responses in the middle of the scale.

TABLE 2
DESCRIPTIVE STATISTICS OF THE PARENTAL PERCEPTION SCALE

Statistic	Value
N	303
Mean	2.47
SD	0.83
Median	2.67
95% CI (Lower)	2.38
95% CI (Upper)	2.57

Note. CI = confidence interval of the mean, estimated assuming a t-distribution with $N - 1$ degrees of freedom.

Percentage distribution of AI-based application use by child age

Table 3 presents the percentage distribution of artificial intelligence (AI)-based application use reported by parents, calculated within each child age group. Among children under 5, reported use was mainly concentrated in virtual assistants (44.7%) and video games or interactive entertainment environments (28.9%), while social interaction platforms (15.8%) and health or wellness applications (10.5%) showed a relatively lower presence. In the 6-12 age group, virtual assistants continued to be the predominant category (55.8%), followed by video games (25.0%) and social interaction platforms (17.3%), with a marginal share for health or wellness applications (1.9%).

Among adolescents aged 13 to 17, there was a marked concentration of reported use in virtual assistants (79.1%), while the other categories had considerably lower proportions, including video games and social platforms (10.4% each), and no reports for health or wellness applications. Finally, in the group of children aged 18 and older, use was mainly distributed among virtual assistants (50.0%) and social interaction platforms (36.4%), with a lower proportion of health or wellness applications (9.1%) and video games (4.5%). These results show a differentiated distribution of AI-based app use across age groups of children, according to parental reports.

TABLE 3
PERCENTAGE DISTRIBUTION OF AI-BASED APPLICATION USE BY CHILD AGE GROUP (PARENT-REPORTED)

Application type	< 5 years (%)	6–12 years (%)	13–17 years (%)	≥ 18 years (%)
Social media platforms	15.8	17.3	10.4	36.4
Video games / interactive entertainment	28.9	25.0	10.4	4.5
Virtual assistants	44.7	55.8	79.1	50.0
Health and well-being applications	10.5	1.9	0.0	9.1

Note. Percentages are calculated within each child age group (column-wise). Values represent the proportion of parents who reported that at least one child in the specified age group uses the corresponding AI-based application. Parents could report multiple children across different age groups; therefore, percentages do not sum to 100% across rows.

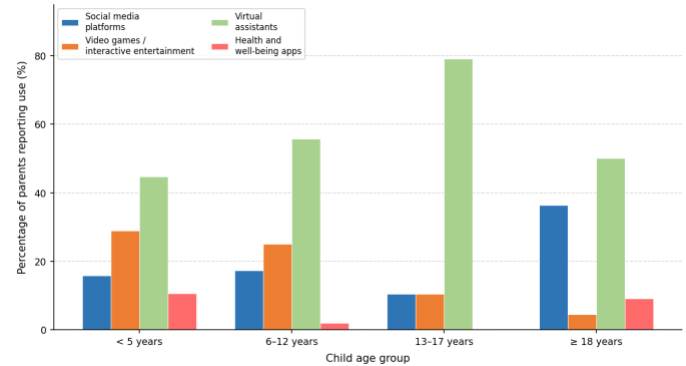


Figure 2. Percentage distribution of AI-based application use by child age group (parent-reported).

Differences in perception according to gender

The existence of differences in the total score on the scale according to the gender of the participants was examined using a one-way analysis of variance with Welch's correction. The analysis did not reveal any statistically significant differences between the groups, $F(2, 2.66) = 4.08$, $p = 0.155$. Levene's test of homogeneity of variances did not indicate any substantive violations of the assumption of equal variances ($p = 0.085$).

Differences in perception according to age group

Differences in the total scale score according to the age group of the participants were analyzed using a one-way analysis of variance with Welch's correction. As shown in Table 4, the analysis revealed statistically significant differences between age groups, $F(5, 42.4) = 4.55$, $p = 0.002$. Levene's test of homogeneity of variances indicated a violation of the assumption of equal variances ($p = 0.017$), so post hoc comparisons were performed using the Games–Howell method.

Post hoc comparisons revealed a statistically significant difference between participants in the 25–34 age group and those in the 45–54 age group, with a lower average score observed in the 25–34 age group (mean difference = -0.55 , $p < 0.001$). No statistically significant differences were identified between the other pairs of age groups.

TABLE 4
DIFFERENCES IN PARENTAL PERCEPTION SCORES BY AGE GROUP

Statistic	Value
Test	Welch one-way ANOVA
Dependent variable	SCALE TOTAL
F	4.55
df ₁	5
df ₂	42.4
p-value	0.002
Variance homogeneity (Levene's p)	0.017
Post hoc test	Games–Howell
Significant comparison	25–34 vs. 45–54
Mean difference	–0.55
Post hoc p-value	< .001

Note. Welch's ANOVA was used due to violation of homogeneity of variances. Post hoc comparisons were conducted using the Games–Howell procedure. Negative mean differences indicate lower perception scores in the younger age group.

Differences in perception according to parents' educational level

Differences in the total score on the parental perception scale according to the participants' educational level were analyzed using a one-way analysis of variance with Welch's correction, due to the violation of the normality assumption evidenced by the Shapiro–Wilk test ($W = 0.982, p < .001$). The analysis showed statistically significant differences between the educational groups, $F(7, 24.9) = 3.47, p = .010$.

Post hoc comparisons using the Games–Howell method indicated significant differences in specific comparisons. Participants with a complete basic education had a significantly lower average score compared to those with a master's degree (mean difference = $-0.885, p = .019$). Likewise, a statistically significant difference was observed between the group with a master's degree and the group with a high school education, with a higher average score in the master's degree group (mean difference = $0.575, p = .024$).

No statistically significant differences were identified between the other educational levels, including bachelor's degree, doctorate, incomplete basic education, incomplete secondary education, and the group without formal schooling.

Latent profile analysis

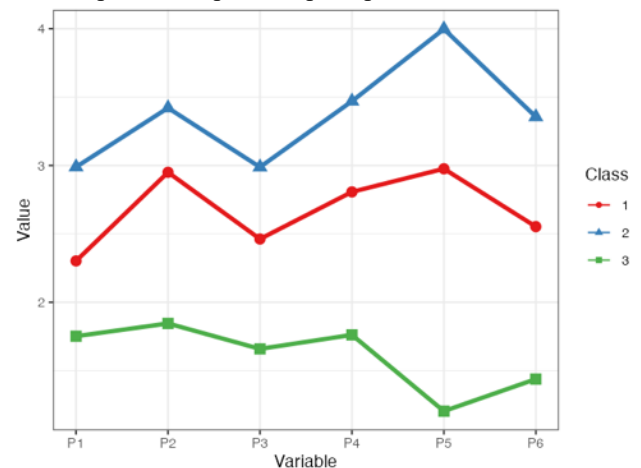
A latent profile analysis (LPA) was performed to identify underlying patterns in parental perceptions assessed through the six items on the scale (P1–P6). Multiple solutions were compared using different model specifications and a variable number of latent classes. Model selection was based on a hierarchical approach to fit indices, including AIC, AWE, BIC, CAIC, CLC, KIC, and SABIC, as well as entropy value. As shown in Table 5, the solution corresponding to Model 1 with three classes had the lowest BIC value (4814) and high entropy (0.976), indicating adequate classification quality. Taken together, these criteria supported the selection of a three-latent-profile solution as the most parsimonious and stable.

The three-class solution revealed distinct response patterns across the six items of the scale, as illustrated in Figure 1. Profile 1 showed intermediate values on all items, with

consistent and moderate scores. Profile 2 was characterized by consistently higher scores on all six items. In contrast, Profile 3 showed lower and more homogeneous scores on all items.

Regarding the distribution of participants among the latent profiles, Profile 1 was the most frequent, grouping 123 participants (40.6%), followed by Profile 3, with 106 participants (35.0%), and Profile 2, which included 74 participants (24.4%). The classification achieved complete coverage of the sample ($N = 303$), with no evidence of small residual profiles.

Figure 3
Latent profiles of parental perception across scale items



Note. The figure displays the mean item scores for each latent profile identified through latent profile analysis. P1–P6 correspond to the six items of the parental perception scale. Profile 1 represents moderate perception levels across items, Profile 2 reflects consistently higher perception scores, and Profile 3 shows uniformly lower perception levels.

DISCUSSION

This study analyzed patterns of parental perception regarding the use of artificial intelligence (AI)-based applications, integrating contextual information reported by parents about the usage scenarios observed in their children. In line with the study design, parents constitute the unit of analysis, while the age of the child and the type of application function as contextual variables that allow us to understand how adults interpret and evaluate the interaction between intelligent systems and underage users. This approach is consistent with the literature on technology adoption in domestic contexts, which recognizes responsible adults as key mediators of access to and use of emerging technologies [8], [11].

The results of the analysis of variance indicate that there are statistically significant differences in the overall level of exposure to AI-based applications among children, depending on their parents' educational level. Although the overall effect was moderate, post hoc comparisons revealed specific differences between some educational levels, particularly between parents with a basic education and those with

postgraduate training. This pattern suggests that educational level may influence how parents allow, supervise, or mediate their children's access to applications with AI components, rather than simply the presence or absence of exposure.

However, the absence of a clear and continuous educational gradient indicates that children's exposure to AI-based applications does not depend exclusively on the level of schooling, but on a combination of contextual factors, such as access to digital devices, the normalization of the use of smart technologies in the home, and everyday parental mediation practices. From a human-centered perspective, these findings reinforce the need to understand exposure to AI systems in childhood as a complex socio-technological phenomenon, where parental decisions are mediated by knowledge, beliefs, and available resources, rather than by a deep technical understanding of artificial intelligence. In this sense, the results provide relevant empirical evidence for the design of digital literacy and parental guidance strategies that consider educational differences without assuming homogeneous patterns of technological use or control.

Parental perception profiles as configurations of technological acceptance

The analysis of latent profiles identified three distinct configurations of parental perception, showing that the evaluation of the use of AI-based applications is not homogeneous among responsible adults. This perceptual heterogeneity coincides with previous studies that have documented the existence of distinct profiles of technology acceptance, associated with different levels of trust, attitudes, and expectations toward AI [1], [10], [17].

Profile 1, which included the largest proportion of participants, was characterized by intermediate and consistent scores across all items on the scale. This profile reflects a moderate perception of the impact of using AI applications, in which parents recognize possible emotional and relational implications without attributing a markedly negative character to them. From the perspective of technology adoption, this pattern can be interpreted as functional acceptance, in which technology is integrated into the everyday environment under schemes of supervision and continuous evaluation. Studies on AI adoption in consumer contexts suggest that this type of acceptance is often associated with a balanced assessment of perceived benefits and potential risks, as well as moderate levels of trust in intelligent systems [2], [15].

Profile 2 had the highest scores on all six items, indicating an intensified perception of the potential impact of using AI-based applications. Parents assigned to this profile tend to attribute greater weight to the possible undesirable effects associated with interaction with intelligent systems, particularly in areas related to communication, emotional regulation, and social interaction. This pattern is consistent with research indicating that technological reactance and concerns about

perceived loss of autonomy can emerge when AI systems operate in a non-transparent or intrusive manner [3], [18]. Similarly, ethical concerns related to data privacy and algorithmic bias have been identified as factors that reinforce cautious attitudes toward the adoption of AI-based applications [13], [14].

Profile 3, on the other hand, was characterized by consistently low scores on all items, reflecting a perception of low impact from the use of AI applications. Parents with this profile tend to normalize these technologies as functional tools within the contemporary digital ecosystem, with less attribution of adverse effects. This configuration may be associated with greater technological internalization, a phenomenon described in the literature as the result of a positive attitude toward innovation and greater openness to new technologies [5]. In this sense, AI is perceived as a natural extension of everyday digital practices, rather than as a disruptive element.

The coexistence of these three profiles confirms that acceptance of AI-based applications does not follow a dichotomous logic, but rather a continuum of perceptions influenced by previous experiences, levels of AI literacy, and interpretive frameworks of responsible adults [9].

Parental age and the evaluation of interaction with intelligent systems

The differences observed in parental perception according to the age group of the parents provide a relevant explanatory element for understanding the distribution of the profiles identified. Younger parents (25–34 years old) showed significantly lower levels of perceived impact compared to older parents (45–54 years old). This finding is consistent with studies that indicate that age and previous technological experience influence attitudes toward intelligent systems, with a greater willingness to adopt them among generations with greater exposure to advanced digital technologies [6], [7], [19].

Given that parents constitute the unit of analysis, these results suggest that adults' technological usage trajectories may modulate how they evaluate interactions between their children and AI-based applications. Greater familiarity with intelligent systems may favor more functional and less alarmist interpretations, while less internalized technological trajectories may be associated with more restrictive or precautionary evaluations. This pattern has been previously documented in studies on AI acceptance in different domains of use, where personal experience with technology emerges as a key predictor of trust and acceptance [5], [16].

Implications for the design of AI-based applications and human–application interaction

The study's findings have direct implications for the design and development of AI-based applications that operate in family environments. In particular, the results show that parents act as indirect users, evaluators, and mediators of the interaction between intelligent systems and underage users, reinforcing the need to consider their perceptions in design decisions [11], [12].

CONCLUSIONS

This study analyzed patterns of parental exposure to AI-based applications and the perceptual configurations associated with their use in family contexts. The results showed a moderate overall level of perceived impact, with statistically significant differences according to parental age group and educational level, but not gender. Latent profile analysis identified three distinct configurations of parental perception—low, moderate, and high perceived impact—reflecting the heterogeneous nature of technology acceptance among adults who mediate children's interaction with intelligent systems.

The identification of differentiated perceptual profiles suggests that AI-based systems should incorporate human-centered design principles, including mechanisms for transparency, explainability, and control that respond to different levels of adult acceptance and sensitivity. Clear communication about how systems work and the ability to understand their algorithmic decisions help build trust and reduce perceived complexity, thereby promoting acceptance of the technology. Likewise, the variability observed according to parental age group indicates that design strategies should not assume a homogeneous user perception, but rather consider diversity in technological experience, expectations, and ethical concerns. Integrating these differences into the design of AI applications can contribute to more acceptable, sustainable solutions that are aligned with real contexts of use, strengthening human-application interaction in family environments.

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