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Identification of Different Infant Cries Based on Auditory Sensitivity of Homosexual and Heterosexual College Students

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ABSTRACT

Infant crying functions as a biologically significant communicative signal through which infants convey physiological and emotional needs to caregivers. Guided by Gender Schema, Attachment Theory and caregiving sensitivity frameworks, this study investigated differences in infant cry recognition accuracy between homosexual and heterosexual college students within the Philippine context. Specifically, the study examined respondents' ability to identify six categories of infant cries: hunger, discomfort, pain, fear, anger, and attention-seeking. A quasi-experimental quantitative between-subjects design was employed involving 100 college students composed of 50 homosexual and 50 heterosexual respondents selected through purposive sampling. Participants were exposed to six pre-recorded infant cry stimuli in a controlled experimental setting and identified the corresponding cry categories using a structured response instrument. Data were analyzed using descriptive statistics and the Mann-Whitney U test following non-normality assumptions. Results revealed a statistically significant difference in overall infant cry recognition accuracy between homosexual and heterosexual respondents, with homosexual respondents demonstrating higher overall recognition scores. Significant differences specifically emerged in hunger and fear cries, whereas no statistically significant differences were observed for discomfort, pain, anger, and attention-seeking cries. The findings suggest that infant cry recognition may reflect variations in emotional attunement, empathic sensitivity, and perceptual responsiveness associated with psychosocial and experiential factors rather than biologically fixed caregiving mechanisms. The study contributes to emerging literature on caregiving diversity, emotional processing, and infant cue recognition while providing preliminary evidence relevant to developmental psychology and LGBTQ+ family research within Southeast Asian contexts.

INTRODUCTION

Crying represents one of the earliest and most evolutionarily significant forms of human communication, functioning as an adaptive survival mechanism that enables infants to signal physiological and emotional needs to caregivers. Infants possess limited verbal and motor capacities during early development, crying becomes a primary communicative tool for eliciting protection, nourishment, comfort, and social interaction. Developmental and attachment-based perspectives suggest that caregivers' ability to accurately interpret infant distress signals contributes substantially to emotional attunement, caregiving responsiveness, and the establishment of secure attachment relationships during infancy (Behrens, 2021). Consequently, sensitivity to infant cries has been widely recognized as an important component of effective caregiving and early socioemotional development.

Infant cries are not acoustically uniform but instead vary according to the infant's physiological and emotional conditions. Differences in pitch, duration, rhythm, intensity, and acoustic structure may communicate varying needs such as hunger, pain, discomfort, fear, or attention-seeking behaviors. According to Dov Zeifman (2020), infant crying functions as a biologically meaningful signal designed to activate caregiver attention and caregiving responses. Similarly, Soltis (2021) explained that cry acoustics contain distinguishable emotional

and physiological markers that allow listeners to differentiate among categories of infant distress. Recent interdisciplinary findings in developmental psychology, auditory cognition, and neuroscience further indicate that the perception of infant cries involves emotional processing, attentional sensitivity, empathic engagement, and neurocognitive interpretation of distress-related cues (Ji *et al.*, 2021).

Within caregiving research, responsiveness to infant distress is increasingly understood as a multidimensional psychosocial process rather than a purely instinctive biological reaction. Contemporary perspectives suggest that caregiving sensitivity may emerge from emotional attunement, empathy, social learning, caregiving exposure, attachment experiences, and contextual influences associated with nurturing behavior. Studies have demonstrated that individuals differ in their capacity to recognize and respond to infant cues, and these differences may be influenced by both dispositional and experiential factors (Laguna *et al.*, 2023). Thus, infant cry recognition may reflect broader dimensions of caregiving responsiveness and empathic sensitivity rather than biologically predetermined parental instincts.

Sexual orientation refers to enduring patterns of emotional, romantic, or sexual attraction toward individuals of one or multiple genders. The American Psychological Association (2020) emphasized that sexual orientation

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exists across diverse emotional and relational experiences rather than rigid binary distinctions. Furthermore, Savin-Williams (2022) argued that contemporary understandings of sexuality recognize fluidity and diversity across romantic and emotional identities. Research involving LGBTQ+ individuals and families has increasingly challenged traditional assumptions that caregiving competence is inherently associated with heterosexual family structures or biological parenthood. Herek (2021) noted that stereotypes linking caregiving ability to sexual orientation often lack sufficient empirical support and may reinforce stigma toward LGBTQ+ populations. Emerging evidence further suggests that caregiving quality is shaped more strongly by emotional, relational, and environmental factors than by sexual orientation itself.

Recent studies examining infant cry perception have demonstrated that humans are generally capable of identifying different categories of infant distress through auditory discrimination of acoustic cues. Laguna *et al.* (2023) reported that caregivers across diverse cultural settings were able to recognize infant distress patterns with moderate accuracy, suggesting that cry recognition may involve both universal and context-dependent mechanisms. Likewise, Ji *et al.* (2021) highlighted advances in infant cry signal analysis and classification, emphasizing that cry patterns contain identifiable acoustic signatures associated with specific emotional and physiological states. Despite these developments, much of the existing literature has focused primarily on mothers, biological parents, or clinical populations, leaving limited understanding regarding caregiving responsiveness among diverse social groups and nontraditional caregiving populations.

Moreover, empirical investigations examining infant cry recognition across differing sexual orientations remain scarce, particularly within Southeast Asian and Philippine contexts. Existing literature has largely concentrated on parenting roles, attachment quality, and family functioning among LGBTQ+ individuals, while comparatively little attention has been devoted to perceptual and emotional responsiveness to infant distress signals. This represents an important conceptual and empirical gap in caregiving and developmental psychology literature. Exploring infant cry recognition across varying sexual orientations may contribute to a broader understanding of caregiving responsiveness beyond traditional assumptions regarding gender, sexuality, and family structure.

Research Objectives

General Objective

To determine whether there is a significant difference in infant cry recognition accuracy between homosexual and heterosexual individuals as an indicator of caregiving responsiveness.

Specific Objectives

1. To measure the infant cry recognition accuracy of

homosexual individuals.

2. To measure the infant cry recognition accuracy of heterosexual individuals.

3. To compare if there is a significant difference in infant cry recognition accuracy between homosexual and heterosexual individuals.

MATERIALS AND METHOD

Research Respondents

The respondents in this study were college students currently enrolled during the academic semester in which the study was conducted. A total of 100 respondents were included and categorized into two groups: 50 homosexual individuals and 50 heterosexual individuals. Respondents were classified based on self-identified sexual orientation to examine potential differences in infant cry recognition accuracy associated with caregiving sensitivity.

The inclusion criteria required respondents to belong to the college-age range and self-report having no known hearing impairments. Additionally, respondents with formal training in music, audio engineering, auditory analysis, or related fields were excluded to minimize potential auditory expertise bias. Equal group sizes were maintained to ensure balanced comparison between groups and reduce sampling bias.

The study employed purposive sampling to recruit respondents who met the established inclusion criteria. According to Tajik (2024), purposive sampling is appropriate for exploratory studies that seek in-depth understanding from individuals who are particularly relevant to the objectives of the research rather than to generalize findings to the broader population. This sampling technique enabled the researchers to focus specifically on comparing infant cry recognition accuracy between homosexual and heterosexual individuals.

Research Instrument

The researchers utilized a structured answer sheet designed specifically for the study. Respondents were instructed to indicate their self-identified sexual orientation by selecting either homosexual or heterosexual at the top portion of the sheet. To preserve anonymity while allowing respondents the option to withdraw their responses if requested, respondents were asked to provide pseudonyms instead of their real names.

The answer sheet contained instructions requiring respondents to identify the category of infant cry by writing the corresponding letter assigned to each type of cry: A for hunger, B for discomfort, C for pain, D for fear, E for anger, and F for attention-seeking. To minimize order effects and response bias, the sequence of the cry categories was randomized during each administration of the experiment.

The infant cry stimuli were evaluated by three validators composed of one psychologist and two psychometricians to assess the appropriateness, clarity, and accuracy of the cry classifications used in the study. Prior to the actual data collection, a pilot test was conducted to assess the

clarity, consistency, and appropriateness of the infant cry stimuli and experimental procedures. Necessary revisions were implemented based on the pilot testing results to improve the consistency and overall conduct of the study.

Research Design and Procedure

The study employed a quasi-experimental quantitative between-subjects design conducted within a controlled experimental setting. A quantitative approach was appropriate because the study aimed to measure and compare infant cry recognition accuracy between two independent groups using numerical scores and statistical analysis. The study was considered quasi-experimental because respondents naturally belonged to pre-existing groups based on self-identified sexual orientation and were not randomly assigned to experimental conditions. Respondents were gathered in a quiet room to minimize external auditory distractions that could interfere with listening performance. Before the experiment began, respondents underwent an informed consent process in which the researchers explained the objectives of the study, research procedures, participant rights, confidentiality measures, and the voluntary nature of participation. Respondents were informed that the study complied with institutional ethical standards and that all responses would remain anonymous and confidential.

Following the orientation, respondents received instructions regarding the completion of the answer sheet. A brief dry run was conducted to ensure that all respondents understood the procedures and response format before the actual experiment commenced.

During the experiment, the researchers sequentially played six pre-recorded infant cries. Each cry stimulus was repeated three times to provide respondents with sufficient opportunity to process and identify the auditory cue accurately. Rest intervals were inserted between cry presentations to reduce auditory fatigue and provide respondents with adequate time to record their responses. To preserve internal validity, all respondents experienced identical experimental conditions, including audio volume, duration of pauses, stimulus presentation procedures, and environmental setting. After the presentation of the final cry stimulus, a debriefing session was conducted in which the researchers explained the objectives of the study, addressed respondents' concerns, and revealed the corresponding cry categories. Respondents were reminded that their participation was voluntary and that all responses would remain confidential. Finally, respondents received a small token of appreciation in recognition of their participation in the study.

Statistical Treatment

The study utilized six categories of infant cries that were evaluated by the validators prior to their use in the experiment to ensure the appropriateness and relevance of the stimuli for the study objectives. Before conducting inferential statistical analysis, the normality of the data distribution was assessed using the Shapiro-Wilk

test. Results indicated that the data were not normally distributed. Specifically, heterosexual respondents yielded $W = .848$, $p < .001$, while homosexual respondents yielded $W = .854$, $p < .001$. Since the assumption of normality was violated for both groups, nonparametric statistical analysis was employed.

To determine whether a statistically significant difference existed in the distribution of infant cry recognition accuracy scores between homosexual and heterosexual respondents, the researchers used the Mann-Whitney U test. The Mann-Whitney U test is a nonparametric statistical test used to determine whether there is a statistically significant difference in the distribution of scores between two independent groups.

Additionally, descriptive statistics, including mean scores, standard deviations, frequency distributions, and percentages, were computed to summarize participant performance across the six categories of infant cries.

To determine the magnitude of the observed group differences, the researchers calculated the rank-biserial correlation as a measure of effect size appropriate for nonparametric analysis. The interpretation of the effect size provided information regarding the practical significance of the findings beyond statistical significance alone.

Ethical Consideration

Voluntary participation. Respondents are informed that their participation in our study is entirely voluntary and that they may withdraw at any time.

Right to Withdraw. The researchers stated that respondents could discontinue their participation at any time during the procedure; there was no coercion, and they were not obliged to participate in our study.

Privacy and Confidentiality. Personal information and other information that could identify the respondents were not collected, and the answers were used only by the researchers and then burned afterwards.

Informed Consent Process. The researchers designed an informed consent form for the respondents that was readable and easily understood, and they assured them that they could ask questions if anything was unclear.

Briefing. Before we start the study, as part of our procedure, we conduct a briefing to ensure that our respondents are emotionally stable and have no presumption about our study.

Debriefing. When the study was completed, a debriefing was done. During this process, the researchers clarified the procedures to respondents, answered questions, and ensured that no unpleasant emotions arose afterward.

Risk. Any significant and potential risks associated with this study were clearly communicated to the respondents, such as auditory sensitivity or discomfort.

Benefits. The researchers conveyed the possible outcome of the study and gave out tokens as a sign of appreciation to the respondents.

Plagiarism. The researchers ensured that all sources used in the study were cited correctly. No part of the

manuscript contained plagiarized material, and all authors and scholars referenced were appropriately acknowledged.

Fabrication. The researchers did not fabricate or alter any data, results, or interpretations. All findings presented in the study were based solely on authentic data collected during the research process.

Falsification. No information from referenced studies was manipulated or misrepresented. All sources were accurately reflected, and the study was grounded in reliable, evidence-based research.

Permission from Organization/Location. The researchers submitted a formal letter to the School Dean explaining the rationale and procedures of the experiment, and approval to conduct the study was subsequently granted.

RESULTS AND DISCUSSION

In this chapter, the data analysis, findings, and discussion are presented. The chapter focuses on the infant cry recognition accuracy of homosexual and heterosexual respondents and compares their performance across the different types of infant cries. The results are organized into frequency distribution of identified infant cries, descriptive statistics by group, and the results of the Mann–Whitney U test.

The Frequency Table of the Different Infantile Cries

The frequency table below presents the number of responses for each cry type, providing an overview of which cry types the respondents most accurately identified. This information serves as a foundation

Table 1: Frequency and Percentage of Identification Across Infant Cry Categories by Sexual Orientation (n=100)

Sexual Orientation	Hunger	Discomfort	Pain	Fear	Anger	Attention
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Heterosexual	5 (10%)	10 (20%)	5 (10%)	1(2%)	27(54%)	2 (4%)
Homosexual	25(50%)	13 (26%)	12(24%)	9 (18%)	29 (58%)	7 (14%)

for analyzing patterns of parental responsiveness and responsiveness, and for comparing differences between groups, such as homosexual and heterosexual individuals. Note: Values represent the number and percentage of respondents who correctly identified each infant cry category. Each group consisted of 50 respondents.

The findings indicate that homosexual respondents generally demonstrated higher infant cry recognition accuracy across most cry categories compared to heterosexual respondents. These findings suggest possible differences in infant cue recognition associated with caregiving sensitivity, empathic responsiveness, attentional processing, and emotional interpretation of auditory distress signals.

Among heterosexual respondents, anger cries obtained the highest recognition rate, with 27 respondents (54%) correctly identifying the cry category. This was followed by discomfort cries, with 10 respondents (20%) accurately recognizing the stimulus. In contrast, fear cries yielded the lowest recognition rate, with only one respondent (2%) correctly identifying the cry. Similarly, homosexual respondents demonstrated the highest recognition accuracy for anger cries, with 29 respondents (58%) correctly identifying the stimulus. Hunger cries yielded the second-highest recognition rate at 50%, followed by discomfort cries (26%) and pain cries (24%). Although fear and attention-seeking cries remained among the least accurately identified categories, homosexual respondents consistently obtained higher recognition frequencies across nearly all cry categories.

The higher recognition rates observed for anger cries in both groups may be associated with the acoustic salience and emotional intensity of highly distressed infant vocalizations. Research has shown that emotionally intense cries are generally easier to recognize because

they exhibit more distinctive acoustic features, such as increased pitch, greater amplitude variability, and vocal urgency (Soltis, 2021; Zeifman, 2020). According to Carollo *et al.* (2023), infant cries associated with high distress activate heightened attentional and emotional processing mechanisms in listeners, making these cries more perceptually salient than lower-intensity emotional vocalizations. Similarly, Parsons *et al.* (2022) reported that emotionally charged infant cries tend to elicit stronger neural and empathic responses, which may facilitate faster and more accurate recognition.

The comparatively lower recognition rates for fear and attention-seeking cries may indicate that these categories possess subtler acoustic distinctions that are more difficult to differentiate perceptually. Previous studies have found that less intense or socially nuanced infant cries often produce lower recognition accuracy because listeners rely heavily on contextual and emotional interpretation when acoustic distinctions are less pronounced (Laguna *et al.*, 2023). Research in developmental auditory cognition further suggests that individuals may experience difficulty interpreting cries with overlapping emotional characteristics, particularly when emotional cues are ambiguous or weakly differentiated (Ji *et al.*, 2021).

The findings also support contemporary perspectives emphasizing that infant cry recognition involves multidimensional psychosocial processes rather than purely biological caregiving mechanisms. Caregiving responsiveness has increasingly been associated with empathy, emotional attunement, social learning, and sensitivity to distress cues (Leerkes, 2020).

The consistently higher recognition frequencies observed among homosexual respondents may reflect differences in empathic responsiveness or emotional sensitivity rather than inherent caregiving superiority.

Contemporary LGBTQ+ family research emphasizes that caregiving competence is not determined by sexual orientation alone but is instead shaped by emotional, relational, and contextual factors (Herek, 2021; Savin-Williams, 2022). Farr *et al.* (2021) further reported that LGBTQ+ individuals and couples often demonstrate caregiving behaviors and parent-child relationship quality comparable to heterosexual populations, reinforcing

the idea that caregiving responsiveness should not be interpreted through biologically deterministic assumptions.

Comparative Analysis of Infant Cry Recognition Accuracy Between Homosexual and Heterosexual Respondents

Table 2: Descriptive Statistics and Mann–Whitney U Test Results for Infant Cry Recognition Accuracy Scores Between Homosexual and Heterosexual Respondents (n = 100)

Infant Cries	Sexual Orientation	n	M	SD	Mann-Whitney U	p-value	Effect size (r)
Hunger	Heterosexual	50	0.10	0.30	750	<.001	.400
	Homosexual	50	0.50	0.51			
Discomfort	Heterosexual	50	0.20	0.40	1200	.608	-.040
	Homosexual	50	0.16	0.37			
Pain	Heterosexual	50	0.10	0.30	1125	.165	.100
	Homosexual	50	0.20	0.40			
Fear	Heterosexual	50	0.02	0.14	1100	.028	.120
	Homosexual	50	0.14	0.35			
Anger	Heterosexual	50	0.54	0.50	1175	.553	-.060
	Homosexual	50	0.48	0.51			
Attention	Heterosexual	50	0.04	0.20	1150	.144	.080
	Homosexual	50	0.12	0.33			
Overall	Heterosexual	50	0.17	0.14	890	.009	.288

Results of the Mann–Whitney U test revealed a statistically significant difference in overall infant cry recognition accuracy between homosexual and heterosexual respondents, $U = 890$, $p = .009$, $r = .29$. Based on the group descriptives, homosexual respondents obtained higher overall recognition accuracy scores ($M = 0.27$, $SD = 0.20$) compared to heterosexual respondents ($M = 0.17$, $SD = 0.14$). The effect size indicated a small-to-moderate practical effect, suggesting that the observed group difference possessed meaningful practical significance beyond statistical significance alone.

When individual cry categories were examined, significant differences emerged only in hunger and fear cries. For hunger cries, homosexual respondents ($M = 0.50$, $SD = 0.51$) demonstrated significantly higher recognition accuracy than heterosexual respondents ($M = 0.10$, $SD = 0.30$), $U = 750$, $p < .001$, $r = .40$. The effect size indicated a moderate relationship, suggesting that the difference in hunger cry recognition was both statistically and practically meaningful. Similarly, fear cries yielded a statistically significant difference, $U = 1100$, $p = .028$, $r = .12$, wherein homosexual respondents ($M = 0.14$, $SD = 0.35$) obtained higher recognition accuracy scores than heterosexual respondents ($M = 0.02$, $SD = 0.14$). However, the effect size for fear cries was relatively small, indicating a weaker practical magnitude of difference between groups.

In contrast, no statistically significant differences were found for discomfort cries, $U = 1200$, $p = .608$, $r = -.04$;

pain cries, $U = 1125$, $p = .165$, $r = .10$; anger cries, $U = 1175$, $p = .553$, $r = -.06$; and attention-seeking cries, $U = 1150$, $p = .144$, $r = .08$. These findings suggest that homosexual and heterosexual respondents demonstrated relatively comparable recognition abilities across several categories of infant distress signals.

The findings may be partially interpreted through Gender Schema Theory proposed by Sandra Bem (1981), which suggests that emotional processing and responsiveness may be shaped by socially constructed gender schemas. Individuals who exhibit reduced adherence to rigid gender norms may demonstrate greater openness toward emotional expression and emotional sensitivity. Within this context, homosexual respondents may possess greater flexibility in emotional processing and attentiveness toward distress-related emotional cues, potentially contributing to increased sensitivity in identifying infant cries, particularly those associated with emotional urgency such as hunger and fear cries.

The significantly higher recognition accuracy for hunger cries among homosexual respondents may be associated with the acoustic salience and rhythmic characteristics of hunger-related vocalizations. Hunger cries often contain repetitive and distinguishable auditory patterns that may activate emotional attentiveness and empathic processing mechanisms. Previous research has shown that emotionally salient infant cries tend to elicit stronger perceptual and emotional responses due to their acoustic urgency and distress-related characteristics (Esposito *et*

al., 2021; Zeifman, 2020). Likewise, fear cries may contain emotional features that trigger affective and attentional sensitivity among listeners, potentially explaining the higher recognition accuracy observed among homosexual respondents.

The absence of statistically significant differences across discomfort, pain, anger, and attention-seeking cries further suggests that infant cry recognition accuracy is not uniformly influenced by sexual orientation. Instead, recognition performance may depend on multiple interacting variables such as empathy, emotional intelligence, attentional processing, caregiving exposure, familiarity with infants, and perceptual sensitivity. Research by Lockhart-Bouron *et al.* (2022) found that adults with caregiving experience demonstrated better infant cry recognition abilities than individuals without caregiving exposure, highlighting the importance of experiential influences in interpreting infant distress signals.

The findings are also consistent with previous literature examining emotional responsiveness and caregiving sensitivity among LGBTQ+ populations. Xu *et al.* (2020) suggested that homosexual individuals may display heightened emotional attunement and distinct cognitive-affective processing styles that influence emotional perception and interpersonal responsiveness. Similarly, Farr and Golombok (2020) reported that same-sex parents often engage in highly intentional and reflective parenting practices, which may strengthen emotional attentiveness toward children's needs. Carone *et al.* (2021) further observed that homosexual fathers demonstrated caregiving sensitivity levels comparable to, and in some caregiving domains higher than, heterosexual parents, particularly in response to infant distress signals.

Within the Philippine sociocultural context, the findings may also reflect the influence of extended family caregiving structures. Ballaret (2024) noted that homosexual Filipinos frequently assume caregiving and nurturing responsibilities within family systems, potentially contributing to enhanced emotional sensitivity and caregiving-related attentiveness. Salvina (2022) similarly suggested that Filipino homosexual adults often develop heightened empathy and interpersonal sensitivity through social and familial experiences. These sociocultural influences may partially explain the higher recognition accuracy observed among homosexual respondents in the present study.

Despite the significant findings, the results should be interpreted cautiously. The present study specifically measured infant cry recognition accuracy rather than actual caregiving competence or parenting effectiveness. Therefore, higher recognition accuracy should not be interpreted as evidence of inherently superior caregiving ability. Caregiving responsiveness remains a multidimensional construct influenced by emotional, cognitive, social, cultural, and experiential factors (Leerkes, 2020). Additionally, the relatively small-to-

moderate effect sizes observed suggest that although differences exist between groups, substantial overlap in recognition abilities remains present.

Overall, the findings contribute to emerging discussions regarding caregiving diversity, emotional processing, and infant cue recognition by suggesting that differences in infant cry interpretation may be associated with psychosocial and experiential factors related to emotional responsiveness and perceptual sensitivity. Future studies incorporating empathy measures, caregiving exposure, attachment orientation, emotional intelligence, and neurocognitive assessments are recommended to provide a more comprehensive understanding of the mechanisms underlying infant cry recognition accuracy.

CONCLUSION

This study examined the differences in infant cry recognition accuracy between homosexual and heterosexual respondents across six categories of infant cries, namely hunger, discomfort, pain, fear, anger, and attention-seeking. Findings revealed that homosexual respondents generally demonstrated higher infant cry recognition accuracy across most cry categories and obtained significantly higher overall recognition accuracy scores compared to heterosexual respondents. Significant differences specifically emerged in hunger and fear cries, whereas no statistically significant differences were observed for discomfort, pain, anger, and attention-seeking cries. These findings suggest that differences in infant cue recognition may exist across groups in selected emotionally salient categories of infant distress signals.

The study suggests that infant cry recognition may reflect psychosocial and emotional processes associated with caregiving sensitivity and emotional cue interpretation. In this context, the higher recognition accuracy observed among homosexual respondents may indicate differences in emotional responsiveness and perceptual sensitivity toward distress-related auditory cues. However, these findings should not be interpreted as evidence of inherently superior caregiving competence or parenting ability based on sexual orientation alone. Instead, caregiving responsiveness remains a multidimensional construct shaped by emotional, cognitive, social, cultural, and experiential influences.

In conclusion, the study contributes to emerging discussions on caregiving diversity, emotional processing, and infant cue recognition by providing empirical evidence that emotional and perceptual sensitivity may influence the interpretation of infant cries. The findings further emphasize the importance of understanding caregiving responsiveness within broader psychosocial and sociocultural contexts. Future studies are recommended to incorporate variables such as empathy, caregiving exposure, attachment orientation, emotional intelligence, and neurocognitive processing to provide a more comprehensive understanding of the mechanisms underlying infant cry recognition accuracy.

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