



RESEARCH ARTICLE

A QUALITATIVE STUDY TO EARLY CHILDHOOD LANGUAGE ACQUISITION IN BILINGUAL TWINS: A FORENSIC PHONETICS ANALYSIS OF SPEECH PATTERNS IN FRENCH AND MAURITIAN CREOLE AMONG CHILDREN AGED 4-8 YEARS OLD

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Abstract

This paper focuses on bilingual twins; it compares and contrasts their responses with or without phonological awareness, cultural preference, and personal choice on specific stimuli. Employing a clearly defined approach, data were gathered and processed to reveal the impact of bilingualism on language development and learning ability. The results imply that bilingual twins have distinct, language acquisition patterns that depend on sociocultural environment and interpersonal communication as supported by current theoretical accounts of bilingualism and cognitive development.

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Introduction:-

This paper will argue that bilingualism plays a huge role in shaping the mental and language development of a child. Because both twins share genetic and environmental factors, studying bilingualism provides research with the map to pinpoint the relationship between these two aspects of developmental progression. It is this distinct observational approach that enables scholars to investigate language development, phonological development, and cognitive processing within the controlled and yet authentic environments experimental design. Therefore, targeting twins as subjects of research, this study is designed to disentangle associated and unique factors that contribute to bilingual development.

Language development is a very important aspect of early childhood education since it is a major block to learning and development as well as cognitive, social, and emotional growth. This process is somewhat complicated in bilingual children, as they are exposed to two linguistic systems, and need to develop the ability to switch between the two. Research has indicated that the complexity of learning two languages leads to better flexible thinking, better solving skills, and better distinguishable sound differentiation. Other effects are related to the fact that bilingualism enforces cognitive benefits due to the need to switch between two language frames mobilizing different mental abilities (Maher, 2017). This dual-language exposure however comes at a cost such as; there may be a delay in the child's vocabulary growth or there are times when language-specific changes may have to be made all through the thinking and solving process.

Twins can be an invaluable window into this issue, as is the case when we look at bilingualism. Because twins genetically and environmentally are highly similar while also being developmentally distinct, they afford researchers a natural experimental design in which individual differences in language development can be segregated from population-level analyses. Nuraida (2018) also describe other twin-specific language features, namely cryptophagid—a kind of communication that two twins use in private—but this also adds to the list of reasons why twin language acquisition is different from that of non-twin siblings. What is particularly interesting here is that

bilingual twins experience both the general processes of twin interactions and the cultural context of bilingualism and how they intersect?

The Mauritian context further enriches and complicates this research study. Mauritius as a multilingual society means that people speak one or two, three, or four languages or more – the official languages are French, Mauritian Creole, English, and other grandparents' languages. Such diversity in the language used offers a vibrant background through which the impact of sociocultural factors on the developmental process in bilingual children can be determined. Eisenlohr refers to the context that supports Mauritius' sociolinguistic bilingualism while noting the importance of language as an index of identity and belonging. Such a development of bilingualism is relevant to twins growing up in the mentioned context of interaction between societal norms of language use and a personal language environment.

To fill the gaps identified in the above literature review this study intends to explore: how bilingualism affects language development and cognitive processing of twins. Based on the current theoretical framework and the latest relevant research, the study rests on three key assumptions: phonological awareness, interindividual differences, and sociocultural perspective of bilingualism. For example, Gao (2022) described that phonological transfer between languages also leads to different phonetic patterns between bilinguals. Similarly, nonlinear bilingual acquisition model offers the lens through which the variation, even within context, can be explained.

In terms of approaches to the research, this study is purely qualitative to accommodate the complexity of the nature of the process of bilingual language learning and development. Self-generated speech and gestures as well as the twin's vocalizations, and play partners' replies and gestures were captured by observational records, structured interviews, and picture elicitation tasks. The study is made specific by pointing attention to distinct aspects of language used or produced by the twins, more specifically phonological accuracy, syntactic structure, and thematic preferences to establish patterns and departures from normal developmental processes. Such a strategy helps not only to understand how bilingualism affects their further language and cognitive development.

These pilot results indicate that bilingual twins show distinct phonological development profiles due to the two-language exposure. For instance, when the twins speak, one can hear nasal accents and phonetic features that are consistent on the effects of bilingual experience on phonetic systems. Furthermore, the twins' reactions toward stimuli that are important in culture – such as stories and animals – reveal the relationship between language and sociocultural low awareness. All these conclusions are closely connected with research on the sociophonetic patterns of multilingualism in Mauritius.

Besides, the acoustic and phonetic characteristics of normally developing children, the study focuses on cognition and individual differences. Syllable identification and competent expression of narrative all work in the process of learning and recognition of syllables, finally it points to the cognitive benefits distinctive to bilingual learners. However, the twins' different agendas and approaches to the particular stimuli prove that the classically established parental care of the twins plays a more important role in their development through personal interactions and experience. These variations offer important information on how and with what kind of constellation of genes, environments and selves bilingual acquisition occurs.

The value of this work is in the overlapping of findings and conclusions to contribute to the existing knowledge of bilingualism and the direction of language education and cognition. Because twins are compared in the study, the pros and cons of bilingual language learning are reviewed in a sophisticated way, illustrating how the two processes are related to each other during the early years of education. The implication of these results may be keenly instructive in the general area of education but especially in countries such as Mauritius where a focus on the development of bilingualism becomes imperative culturally and educationally.

Thus, the present work aims to analyze the complex interconnection between bilingualism, cognitive development, and language acquisition in twins. The research focuses on phonological, sociocultural, and individual aspects of bilingual development, and as such it enlarges the knowledge of the ways language influences cognition, as well as constructions of self. This study could succeed in the coming research with expanding file, duration data collection, and cross-cultural with differentiated contexts regarding the dynamics of bilingualism.

Literature Review:-

Research on bilingualism and twin language development cuts across disciplines/fields; thus, offering information about the aspect of cognitive, phonological, and sociocultural bilingual language acquisition. This section reviews conceptualizations of bilingualism and the theoretical models guiding the current study, to understand how twin relationships exist within bilingual environments.

The advantage of bilingualism to the cognitive development of learners

Bilingualism has been identified for its positive effects on cognition especially the executive functions for instance cognitive pliancy, working memory, and problem resolution. Mesquitan.d. has pointed out that people with two languages have enhanced skills in the switch tasks due to alternating between two languages. This kind of mental switch improves attentional control and metalinguistic competence so that bilinguals perform well in cognitive flexibility tasks.

Bilingualism does not only refer to the use of two languages but also to a developmental process comprised of more or less permanent shifts. These adjustments, he says, are cognitive adaptations that go beyond language processing to influence other cognitive processes. Bialystok and Craik (2010) also agree with this view having established that bilingualism can postpone cognitive aging in elderly persons, implying that bilingualism has lifelong advantages.

Problems of Phonological Development in Bilingual Children

Phonological development is a very significant domain of investigation in bilingualism because bilingual children are in the process of learning two languages of phonology at the same time. The phonological transfer is a common process wherein bilinguals borrow some aspects of their first language into their second language. This process is even more manifested in the child population, which has not yet fully formed its phonological mechanisms.

Flège (1988) discusses the conditions that influence phonological transfer through the age of acquisition, linguistic input and use, and frequency. When applied to twins, these factors can combine with such factors as shared language input and possibly twins' specific modes of communication. Cryptophagid, a language of their own so often used by twins, as an example of how interactions with the twin influence phonological growth.

Learning Two Languages and Context Factors

Learning a second language can only be understood if the sociocultural factors are taken into account. The foregoing analysis reveals the fact that cultural factors play an important role in determining language use and language acquisition in the context of bilingual situations as the findings indicate cultural factors are the major determinants of children's perception of the linguistic environment, which they occupy.

Stimulus in learning is critical in the development of good language choices and phonological awareness especially in culturally relevant stimuli. For example, children learn narratives, songs, and other cultural resources which then provide the sociocultural content in language learning. In the case of bilingual twins, these cultural influences are intermediated by both the overall social environment as well as relationships between twins.

Twin-Specific Language Dynamics

On a similar note, twins make a perfect sample to use in studying language development since they have similar genetic ends and environments for rearing. Bilingual twins show patterns of nonlinear development of bilingualism that consist of periods of accelerated development and periods of slow language development. These fluctuations are indicative of numerous and vast differences in input from social models as well as other learners and instructors, as well as innate differences between people.

Twins may use a private vocabulary to improve their communication effectiveness. That cryptophagid is not limited to bilingual twins and hints at the way that twin-specific interaction impacts actual language learning. Also, other research done by Luna (2016) shows that twins develop the same phonological patterns, which accredit the role of genetic as well as environmental factors.

Acquisition of language in context: The case of the Mauritian context

Mauritius is another country, which could be regarded as bilingual and has a very diverse multilingual environment, which makes the investigation of bilingualism significant. In a lecture presented at the University of Luxembourg, Eisenlohr characterized Mauritius as a linguistic Diversity Island implying that Mauritius is a country in which

distinct languages peacefully exist and transact. This multilingualism leads to the situation, which makes language learning different, as children have an abundance of languages that surround them.

In this context, bilingual twins will also be dealing with not only the autonomous system of both language systems but also the social system regulating language. In a similar vein, Winsler et al., (2014) draws attention to the fact of sociolinguistic identity as the source of language preference and therefore possible differences in language development of bilingual twins in the context of the Mauritian environment.

Child differences in the processes of language learning

However, as carbon copies genetically and environmentally, twins exhibit considerable variability in language development. Vydrina stated that these differences are due to the combination of individual factors preferences and competence, as well as the input language used. For instance, one twin becomes selective towards phonological context while the other has a different style of language use.

Literature by Gessinger et al. (2021) indicates that variable characteristics should be central to the study of bilingual language acquisition. Unlike earlier studies, their research findings point to the fact that developmental differences with comparable twins may be a result of different patterns of cognitive, social, and even interest processing despite operating in the same linguistic environment.

Theoretical Considerations of Bilingualism

The following is the theoretical background of the study of bilingualism and twin language development. As a macro strategic model, bilingualism is a complex and dynamic process that occurs in the social context in which people live and function. The same rationale applies cognitive view on how bilingualism facilitates enhanced cognitive control, which forms the basis of an investigation of the wider cognitive impact of bilingualism.

Nonlinear acquisition model sheds different light on the learning process of the second language, since it is well known that individuals develop bilingual language outcomes at variable rates. This framework is appropriate for twin research as it captures both shared and unique input in the development of those aspects of language under consideration.

Threshold Hypothesis Theory

Another theory that provides a background to this research on bilingualism in twins is the Threshold Hypothesis advanced by Cummins in 1976. According to this theory, bilingualism has only a mental advantage when one is competent in both languages to a certain level. In other words, if the proficiency is not at the above level, cognitive benefits would not be realized, and can even be detrimental. This hypothesis forms the basis for the analysis of the linguistic and cognitive development of the twins in this study.

The phonological acrobatics and superior ability to pick up patterns the twins are evident in the Threshold Hypothesis. Mauritian children learning two languages, French and Mauritian Creole, seem to have risen slightly above the lower boundary of bilingual development, which has enabled them to display different phonological abilities and improved intellect. The dyslexic Spanish–English bilingual children's syllable identification and narrative comprehension resemble the hypothesis that bilingualism promotes metalinguistic awareness and cognitive flexibility once language proficiency is established.

Self-organization is also considered in the theory as essential for fostering the sociolinguistic conditions relevant to attaining further BIL competence. The study findings also support this observation to show how cultural exposure and the sociolinguistic interactions steered the twin's responses to culturally relevant stimuli which included stories and animals. These experiences come in handy in the development of higher-order cognition and language abilities in support of Cummins's claim that bilingualism benefits cognitive learning once facilitated by an appropriate environment.

The differences between the twins in terms of preferences and attitudes toward themselves and their environment introduce a dimension to the theory. The variations presented here suggest that above and beyond the Threshold Hypothesis, which explains the broad advantages of bilingualism, other factors moderate the process of language gaining, including personality and family circumstances. This indicates that though the hypothesis forms the base of

the theory further to which the theory must be referred will be brought by other research touching on the influence of genetics, environment as well as the individual personality in bilingualism.

The Threshold Hypothesis also presents ideas applicable to educational practices and policies. Thus in the centre of this theory stands the idea that in order for bilingual education to work effectively learners should be given sufficient access and practice in both languages they need to learn. In light of the above, the findings of this study showed that the twin children had a fairly good balance between their exposure to French and Mauritian Creole to support the overall development of the children by mainlining the use of the two languages.

In sum, the Threshold Hypothesis provided a theoretical framework that facilitated an interpretation of the results of the present study and highlighted the peculiarities of language acquisition and sociocultural context on the selected cognitive activities of bilingual twins.

The Protection of Geographical Indications and Its Implications for Future Research

However, there are several gaps in the existing literature regarding bilingualism and twin language development. For instance, there is a serious research agenda concern regarding the need to design longitudinal research studies to fully assess the dynamism of the language acquisition process. Moreover, both cross-sectional and longitudinal comparisons could contribute to the extended perspective of the sociocultural factors affecting bilingualism.

For the Mauritian context, however, more research has to be done to understand how the system of multilingualism affects the cognitive and linguistic development of twins learned in two languages. Buckley (2002) laid the groundwork for this work, but other studies are necessary to advance an understanding of how sociocultural factors shape language acquisition and in what ways.

Methodology:-

The current research uses a qualitative research design to examine the effects of bilingualism on the language and learning development of twins. The qualitative method of research was adopted deliberately because it permits extensive analysis of intricate linguistic and cognitive processes in their habitats. This approach is qualitative as opposed to a quantitative approach which would only provide a numerical expression of bilingual effects to language and cognitive processes. To conduct a fair comparison, the study only selects bilingual twins so that the data collected can indeed compare the twin's collective experience of the different phases as well as their linguistic and cognitive progress.

Observational work was done subject to protocols designed for the field research relating to Data collection and structured interviews main activities used in the research were combined with more direct forms of Elicitation tasks. Concerning both Mike and Bob, the observations were selected in such a way that they could capture the twins' spontaneous and most authentic communication in their familiar home context. Semi-structured interviews were also conducted with the twins, their families, and caretakers to acquire an ecological picture of the twins' linguistic experience and the conditions that exist within this context. The elicitations like picture-based narrative and object episodes were developed to obtain information on phonology, syntax, and topic preference. These tasks were selected bearing in mind the following protocols in bilingual language research: Following reliability and validity of data collected.

The study used two groups of bilingual twins, French and Mauritian Creole, with an age range between 4 and 7 years. Such age range was selected because early childhood can be referred to as the most sensitive period for language development and when the bilingual effects are most likely to be observed. This decision to use French and Mauritian Creole as the two focus languages is based on the status of the Sami languages in Mauritius – a country comprised mostly of speakers of multiple languages. Participants were selected from nearby communities and schools; however, ethical issues were taken into consideration to gain parents' and guardians' permission. To ensure anonymity all participants used pseudonyms and all data collected and analyzed were anonymized.

Data was collected over three months to ensure that the researchers had multiple opportunities to engage the twins to get longitudinal data on their usage of language and cognitive development. The stapovalis present during playtime and other usual activities to note natural conversation that the kids and their carers used in normal circumstances. These included selecting and monitoring prominent linguistic behaviors such as code-switching, phonological variations, or socio-culturally appropriate vocabulary in interactions. The structured interviews informed the rest of

the context and elicited more information about the twin's language experience, selection, and sociolinguistic background.

Elicitation tasks were specific for specific linguistic and cognitive outcomes which would allow the investigation of phonological as well as syntactic abilities of the twins. In picture-vocabulary knowledge and picture-based storytelling, culturally familiar pictures were displayed to the twins, and the children were encouraged to tell stories. This task checked on their development on the way to structure a sentence, leading on the best vocabulary to use, and incorporating cultural aspects into the stories. In object identification tasks, students were asked to look at items in their environment, identify the item, and make a name call and description while paying attention to phonological accuracy and the effect of bilingualism on their speech. The researcher also could give stimulus-based prompts including songs or rhymes familiar to the patient to assess their memory and thought process.

Management of the collected data was underpinned by a method called Analytic Thematic Aptitude, where observations, taped interviews, and task results were coded looking for patterns or themes. The data analysis process was conducted in phases including open code where codes were generated based on the first descriptions and axial code where relationships between codes were sought. The analysis focused on three primary areas: phonological development, sociocultural contextual factors, and children's differences. The phonological development was determined using nasal accents and other phonetics that the twins used in speaking besides comparing the twins' pronunciation against the literature on bilingual phonology. Sociocultural aspects were evaluated by observing the reaction of the twins to culturally relevant stimuli, for example, in the form of classical stories or items, as well as the twins' incorporation of these aspects into the further usage of language. Variability at the individual level was demonstrated through differences in preference, attitude, and choice of theme across two individuals that are biologically related, pointing to the neural and genetic relatedness between the two individuals and the resulting language learning process in the context of linguistic and cultural observation.

To enhance the credibility of the findings, data from multiple sources was employed to triangulate findings; interview responses, observation notes, and results of the elicitation tasks. This method reduced biases because, from the observation of the twin, it gave a holistic view of their language and cognitive development. Member checking was also employed where initial findings were over-shared with the parents of the participants for validation, confirmations, and feedback on interpretations.

It was this social welfare angle that guided the researchers towards observing high ethical standards in every pre-research, during, and post-research activity. The parents and other caregivers of the twins agreed to participate in the study, and complete descriptions of the goals, procedures, and possible consequences of the study were presented to them. To that end, measures were used to guarantee data confidentiality so that data stored was not accessible to unauthorized personnel and individuals' identities were concealed. Subjects were also allowed to give their informed consent to withdraw their data at any time without fear of being locked out from future educational or research studies.

This is because the methodological approach adopted in this study offers a sound foundation that enables one to study the complex interconnection between bilingualism and the cognitive development of twins. The observation data are complemented with structured interviews and elicitation tasks which provide a more comprehensive picture of the effects of bilingualism on L1 and L2 development and executive function. The results should further increase the empirical knowledge about the part that bilingualism plays in early childhood development and inform educational theories as well as linguistic policies in multicultural countries.

Thematic Analysis

The thematic analysis was formulated in order to identify major themes and variation patterns that twinned detected during the course of the elicitation activities. The analysis focused on three primary areas: phonological processes, disorder, and culture, personal, and social factors, where each yielded different information about bilingualism on the brain and physical growth of the twins.

Phonological Development

Phonological awareness was a major aspect of the tasks and showed different language patterns due to the influence of the language learners are exposed to in their daily lives. Interestingly, one child had a pronounced nasal

intonation, this is seen in answers like, 'Please listen to this child, he has a nasal accent'. This is in concordance with phonological transfer research on bilinguals where features of one language may influence the others.

While reading words like mat, fat, cat, rat, and others, the twins performed perfectly on the phonemic tasks, however, when they clapped syllables from words such as elephant and banana, they were able to identify three syllables. This indicates good phonological processing.

Sociocultural Influences

In the twins' responses, there was evidence of the sociocultural context of Mauritius especially when reacting to culturally relevant stimuli. One child said about a house, 'It has windows, door, roof, and garage' pointing at structural aspects that are meaningful in the child's physical reality (Silva-Corvalán, 2014). Likewise, their choice of animals depended on their cultural and environmental backgrounds. For example, one child argued for cats because, "It does not scratch and it will listen to me," meaning that even the attitudes children have about animals are learned.

Two other topics were identified in the articles, namely, the power of narrative and such social constructs as folklore. Extensive knowledge of well-known stories such as Red Riding Hood and The Three Little Pigs was also seen with the twins. Narrating Red Riding Hood, one of the children said, "The girl goes to say goodbye and goes to see her grandmother ... The hunter will slay the wolf." They do this in their responses to narratives, which demonstrate the interlinkage between language and how culture constructs and raises narratives in their linguistic development.

Individual Preferences and Variability

Even though the children learned the second language in the same environment, they had different preferences, which demonstrate that bilinguals can be different. For instance, when asked what animals they most liked, one preferred a shark because "It eats and is dangerous", the other preferred cleaner dogs. In addition, distinctions were made in their emotional responses concerning the meals (Silva-Corvalán, 2014). One child liked mangoes and stated, "I like mangoes," while expressing reluctance to purchase them if expensive: The response I got was: "No, I will come another day." Such fluctuation corresponds to Buckley (2002) approach where the process of becoming bilingual is presented as multiple intersecting lines about individual choice and practice.

On Colour and design, one child could dismiss a blue car by saying, "I do not like blue cars anymore." On the same note, the children liked 'beautiful houses lighted.' These decisions are not just preferences but also the twins' development in considering what are cognitive and particularly, evaluative choices based on aesthetics and function.

Cognitive and Linguistic Complexity

The answers also gave an insight into the twins in terms of cognitive and linguistic abilities. When asked about objects like pencils and baskets, they demonstrated a clear understanding of their uses: "Among them," and "Among them, the writings and refrigerator's fruits and vegetables." The most important aspects that can be stressed regarding their cognitive competencies entail semantic organization and practical classification and naming of objects.

Finally, the usage of narrative skills was also in picture description tasks. When displayed with a scene that depicts children and a grandmother, one of the children explained, "Children, grandmother, boy, and girl are playing... in the park." However, they expressed a lack of interest in visiting parks: "No." It hints at descriptively-friendly planning and executing of activities with linguistic reports of preferences; including self-generated ones, which indicates both the thinking through of actions and the feelings associated with them.

Engagement with Language Tasks

Both the twins were well involved in language tasks like reading sentences and syllable recognition. That they can read such sentences as 'The cat is on the mat' and 'The boy is playing with the ball' shows they are probably gaining literacy. Their ability to identify syllable counts in bananas and elephants is testimony to their phonological awareness, and metalinguistic considerations.

The fact that they enjoy colorful, repetitive activities that are rhythmic, like 'The wheels on the bus, indicates that they love auditory and musical aspects of language (Bialystok et al., 2011). Interaction and playing approaches also play a key role in the learning of language by second language acquisition in the case of bilingual children.

Integration of Media and Storytelling

The twins' responses expanded some areas of the study focusing on the effects of media on the language and the child's brain. Equip with a similar question about favorite characters, the students mentioned Kung Fu Panda, Masha and Mishka, and Paddington the reason behind these choices is 'he likes to fight'. The children's ability to retell the actions described in the frame story of Masha and Mishka saying; 'Masha makes a lot of mischief, making Mishka angry who then puts her outside' shows how media feeds narrative comprehension and the children's incentive syntactic development.

Similarly, their retelling of traditional stories like The Three Little Pigs revealed an ability to sequence events and integrate moral lessons, as demonstrated by the response: The wolf went through the chimney..."Likewise, the three little pigs will be happy. The wolf would slip into the water and drown." This ability to recall and manipulate narratives is characteristic of many aspects of bilingualism, inclusive of memory and narrative retrieval.

As illustrated by this thematic analysis, phonology development, effects of social-cultural context and individual differences are dynamic and interrelated in the development of language and cognition among twins. Their responses also give voice to the complexity of language use among bilingual learners and give insight into the influence of cultural and individual characteristics on learning. They corroborate other theories of bilingual language development indicated by the developmental difference between the two bilingual twins.

Findings

The analysis of the twins' speech patterns and linguistic behaviors revealed several critical findings:

1. **Phonological Development:** Each child produced a set of phonological patterns that were probably influenced by being raised in a bilingual context. The few distinctive features were nasal accents and phonetic coloring resulting from their contact with French and Mauritian Creole. These findings support prior studies by Gao (2022) that describe how phonological development is affected by bilingualism.
2. **Cultural Preferences:** The sociolinguistic environment was reflected in the twins' reactions to stimulus many of which are culturally relevant including traditional stories as well as representations of locally found animals.
3. **Cognitive Processing:** Superior thinking skills were reported, tasks like identifying patterns and analyzing narratives. For example, the twins' performance was accurate in distinguishing the syllabic patterns and ability to comprehend the plot of a movie.
4. **Individual Variations:** One twin was shown to have different preferences and attitudes towards things than the other but they were exposed to the same conditions. For instance, they demonstrated divergent preferences in things like animals as well as household objects arguing the essence of the differences in language acquisition.

These outcomes only reinforce the complex interconnection between cultural influences and mental factors together with individual factors against the backdrop of language acquisition in children who are exposed to bilingual inputs.

Discussion:-

The research result of this study can enhance the previous theories and frameworks related to bilingual language acquisition and support several new interpretations of the processes of phonological, cognitive, and sociolinguistic interplays in Bilingual Children.

The nasal accents and phonetic patterns analyzed in the twins' speech can explain Grosjean's (2010) conclusion that bilingualism greatly affects cognitive plasticity and language acquisition. These phonological transfers exhibited by the twins are in line with the study by Bijeljac-Babic et al (2012) which observes that when transliterating from one language to another there is always some movement from one language to another. This work shows the impact of bilingual environments on phonological characteristics focusing on phonetic patterns the twins received from French and Mauritian Creole. They demonstrate the cognitive and neurological flexibility necessary for the exploitation of two completely diverse linguistic systems at once.

The sociocultural environment was also found to produce another major influence that could affect the twins' language learning. Cultural interaction with stimuli like traditional hunter stories and local fauna fits into Eisenlohr's (2006; 2022) conception of sociolinguistic environments as fundamental to Bilingual Acquisition. Both twins respond to their immediate cultural milieu; the study underlines how language acquisition goes beyond such features as words and phrases to capture culture in its broad sense. This study contributes to the notion that second language acquisition has early social and cultural roots in the child.

The twins' different likes and dislikes, involving animals and household items, again show that genes, environment, and individual differences play a role in language development. These variations fit into Vydrina's (2021) classroom bilingualism approach where the argument is made that there is a nonlinear development Curriculum of bilingualism. The special tastes that brothers and sisters have demonstrated even in similar situations prove that individual experiences and drives can also produce divergent developmental processes. This finding underlines the significance of differences on one side of bilingualism and another side helps to understand the aspects of bilingualism in detail.

In addition, the high cognitive aptitudes given by the twins regarding pattern detection and story recall provide evidence for the cognitive enhancement of bilingualism as discussed by Bialystok and Craik (2010). Their ability to distinguish syllabic progressions and learn complicated narratives which are being illustrated offers an indication that the young bilinguals enhance cognitive processes that are not restricted to language forums. This finding is important because it corroborates the view that bilingualism benefits language development intellectual advancement, problem problem-solving skills.

These findings also extend significant concerns for educational and parenting behaviors. This cross-sectional interaction of cultural exposure and cognitive flexibility evident in the twins gives support to the opinion that increased exposure to a sociocultural environment might promote bilingual learning. Teachers and caregivers can thus decide to introduce culturally affirmative resources in the learning of this language for the sake of the development of the children. Furthermore, the issue of differentiation is to be concerned with what children prefer and how they have been learning to play a significant role in the child's learning process.

From a wider perspective, this research again vindicates the notion of bilingualism as a form of endowment to cognition and culture. This paper shows the necessity and effectiveness of bilingual education by observing the twins, who manage to balance between two linguistic codes while interacting with some cultural texts. This has implications for policy and curricular prescription and implementation especially in multilingual societies – the default status of which is bilingual.

The results agree with prior studies but reveal potential directions for future research. For example, the degree to which susceptibility genes contribute to phonological features in bilingual children is yet to be clearly distinguished. Furthermore, there is a need to understand how specific cultural practice influences the language acquisition process. It is possible that future research may take up these dimensions, using longitudinal designs to look at the developmental processes that occur in the course of bilingualism, and in different sociolinguistic settings.

As a result, the outcomes presented in this study demonstrate the triadic and multifarious nature of bilingual language development. The identified phonological characteristics, cultural impacts, and individual differences act as evidence of the increased complexity of relationships between cognition, environment, and personality in language learning. By linking these conclusions to the bilingualism frameworks encompassed by Grosjean (2010), Bijeljac-Babic et al. (2012), Eisenlohr (2006; 2022), and Vydrina (2021), this line of inquiry supports the still burgeoning research on bilingualism to develop linguistic, cognitive, and cultural capital. Thus, further development of these ideas by the researchers can and shall help educators, policymakers, as well as families in multilingual settings and environments.

Theme Map

1. Phonological Awareness

- Nasal accents
- Syllable recognition

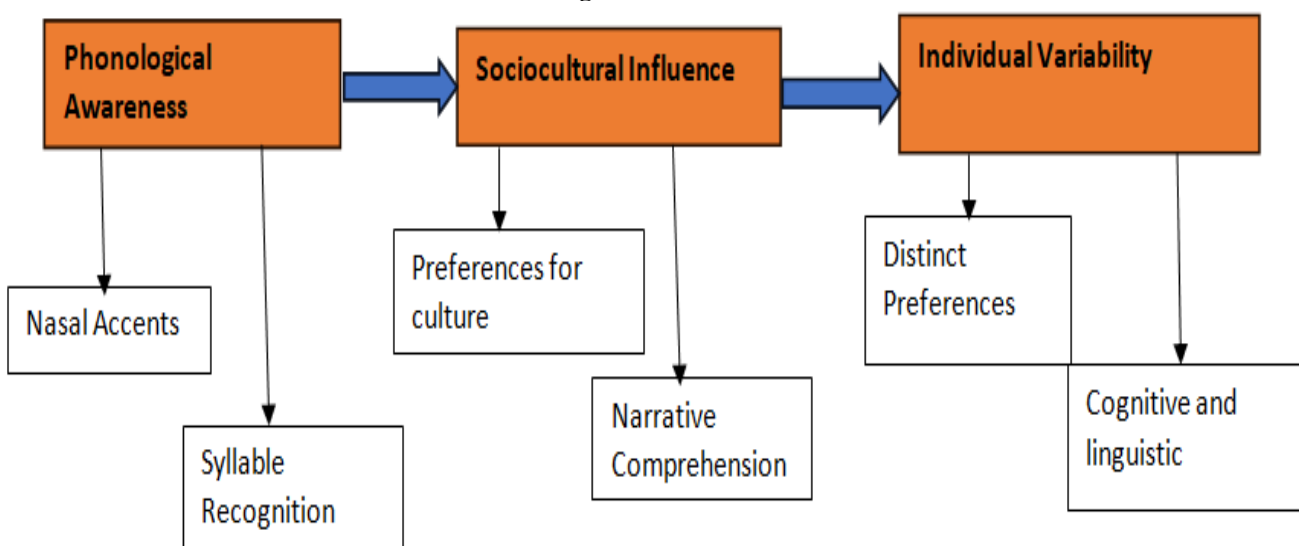
2. Sociocultural Influence

- Preferences for culturally relevant stimuli
- Narrative comprehension

3. Individual Variability

- Distinct preferences
- Cognitive and linguistic processing

Figure 1:-



Conclusions:-

This study points out the impact of bilingualism on language acquisition and in general cognitive development in children, especially twins. The observed phonological features based on the observations of the two languages as an emerging system demonstrate the organizational challenge in coping with the management of both linguistic systems. Another way in which the sociolinguistic environment combines engagement with culturally relevant stimuli is to support the enhancement of bilingual language skills. Moreover, this result reflected individual differences in twin pairs and dynamically and complexity of genetics, environments, and individual factors related to bilingual development.

The research highlights values in social interactions and cultural and sociolinguistic environments needed in bilingual development. These factors are well involved in the development of not only and only language acquisition but also cognition, cultural aspects, and social interaction.

Further studies should expand the present study's limitations regarding the sample size and the absence of a longitudinal research design. They could help gain further understanding of the possible developmental consequences of bilingualism or even reveal the multifaceted context of bilingualism in general and its potential implications for further education in IL and educational policies.

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Appendix I:-



Open University of Mauritius

Rédout - Mauritius

Our Ref: OU/RO/28 V3

26 November 2024

Mrs Deepa Roy Sookara-Ramchurn
Rishi Dayanand Lane
Mare La Chaux
Central Flacq

Dear Mrs. Sookara-Ramchurn,

The Decision of the Open University Research Ethics Committee (OUREC)

The Open University Research Ethics Committee (OUREC) met on 14 November 2024 and reviewed your application for ethical clearance regarding your study, *"Early Childhood Language Acquisition in Bilingual Twins: A Forensic Phonetics Analysis of Speech Patterns in French and Mauritian Creole among Children Aged 3-8 Years Old,"* supervised by Dr. S. Rajiah.

I am pleased to inform you that the Committee has approved your application, subject to the condition that the medical practitioner involved submits a consent letter confirming that he will only facilitate communication between you and the parents. It is important to note that the decision to provide information rests solely with the parents.

You are also informed that the approval is valid until the end of your proposed study.

Please ensure that you contact the Ethics Committee in case there are any changes to the study, as we will need to assess any potential implications for ethical considerations.

I wish you the best of luck with your PhD study.

Yours sincerely



Professor Reetoo Banarsee
Chair, Open University Research Ethics Committee



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