
Incorporating Sociolects in CUIs for Children and Families

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Abstract

In this paper, we discuss issues that are particularly relevant for children and families around Conversational User Interface (CUI) with a focus on incorporating sociolects (i.e., Singlish) in Singapore. In particular, we examine the relationship between culture, identity and CUIs and how such interactions are embedded in the everyday life of a CUI interlocutor. Two major points are investigated: (1) role of CUIs with sociolect as an educational and interactional resource for children and families, and (2) challenges in designing inclusive CUIs with sociolects in homes.

Author Keywords

CUIs; voice interfaces; sociolects; Singlish; heterogenous families; intergenerational communication; challenges; tones.

CSS Concepts

• **Human-centered computing** → **Natural language interfaces**; *Collaborative and social computing systems and tools.*

Introduction

The use of conversational agents can be found on a large proportion of personal smartphones and tablets. These agents, often referred to as conversational user interfaces (CUIs), voice user interfaces (VUIs), voice

assistants (VAs), conversational agents, or intelligent personal assistants (IPAs) are described as embodying the idea of a virtual butler that helps you 'get things done' [1, 3, 5]. Here, we use the term *conversational user interfaces* (CUIs) to describe the interaction between humans and a virtual agent.

Despite the wealth of research in dialogue systems associating with CUIs [1, 2, 3, 4, 5], research that empirically examines interactional issues of CUIs with sociolects is scant. Little is known about the practical accomplishment of interactions with CUIs with sociolects and how such interactions unfold in homes. We believe this absence is significant because understanding the relationship between sociolects and CUIs is crucial given that the use of sociolects is embedded in everyday life of CUI users.

In Singapore, Singlish is a sociolect that is seen as a central expression of Singaporean culture. Understanding how the interaction of CUIs with Singlish unfold especially in homes, allows us to leverage on the ubiquitous use of CUIs to educate and promote one's own identity and culture to children. Hence, in this paper, we seek to understand the role of CUIs with sociolect as an educational and interactional resource for children and families and account for the design of CUIs with sociolects for home settings.

Background

Singapore is a multiracial and multicultural society with four major races namely Chinese, Malays, Indians and Eurasians. Singlish is a sociolect that arises from an unusual blend of the country's official languages (English, Mandarin, Malay and Tamil) and other languages and dialects including Hokkien, Teochew,

Cantonese and Bengali [12]. This variant language extensively borrows syntax and vocabulary from the different spoken languages and dialects in Singapore [12]. For example, the word *Shiok* is derived from the Malay language, which can be translated as 'fantastic'. It is used to convey feelings of satisfaction and pleasure and is often used in association with food. Words like *Paiseh* and *Kiasu* are popular phrases derived from Hokkien. They meant 'embarrassed/sorry' and 'competitive' respectively. As an illustration, we would say *Sorry, I'm late* in English. In Singlish, Singaporeans say *Paiseh, I'm late*. This goes to show how expressions of emotions and feelings can be quickly conveyed via Singlish.

Singlish also has a range of 'invented words' – *lah*, *leh*, *liao*. These words do not have meaning on their own but can dramatically change the tone and expression when affixed to the end of a sentence. Table 1 shows how adding a single word of sociolect can subtly change the meanings of words in English.

Singlish	English
I don't have <i>lah</i>	I really don't have it
I don't have <i>leh</i>	For some reason I don't have it
I don't have <i>liao</i>	I used to have it, but not anymore

Table 1: Illustration of how Singlish suffixes subtly change meanings.

Related Work

Research on human-agent interaction has been extensively looked into and its application has been extended to different settings, but not limited to, using CUI in a multi-party conversation [1], customer service [2] and CUI in the life of homes [3]. In many of these

1	Child:	What does <i>Eh</i> means?
2	Agent:	<i>Eh</i> in Singlish is used to address people or get their attention.
3	Child:	What is the difference between that and English?
4	Agent:	In English, we say <i>Do you want to have lunch?</i> In Singlish, we say <i>Eh, wanna have lunch?</i>
5	Agent:	Here is an example of a conversation in the food court.
6	...	<Illustration of the conversation is shown>

Table 2: An illustration of a conversation showing the agent's response to the child's query. The agent explains the use of the Singlish word, outlines the differences between Singlish and English and uses stories to illustrate the use of Singlish in the community.

researches, CUIs are predominantly found in task-oriented applications to help users with administrative and simple, practical needs such as scheduling, issuing reminders and finding information [1, 2, 3, 4]. Porcheron et.al. [3] found that in 883 distinct request utterances found in homes, talks that is directed to Amazon Echo is of the following type – answer a trivia question, play music or set a timer. This depicts the current functions of CUIs which are limited to command and instructional roles. Exploration of CUIs as an educational role remains severely underdeveloped.

Hardly any studies in CUIs have been specifically designed for sociolects with an educational purpose, such as helping children to develop cultural awareness and promoting culture and identity. Only in one study, Santos et. al. [4] designed a conversational flow to help children develop their emotional awareness through the use of a Chatbot. As such, more work has to be done to incorporate CUIs with sociolects and using CUIs as an educational role for children in home settings.

Educational role of CUIs with sociolect

Intergenerational communication

Aging population is one of the most significant global trends in the 21st century [10]. By 2030, one in four Singaporeans will be aged 65 and above [10]. An unprecedented profound age shift brings conflict between the young and old. One of which is intergenerational interaction which can be impeded by language barriers, since many baby boomers speak only dialects while the young are more comfortable speaking English [6]. This problem between the different age cohorts is aggravated with the rising number of nuclear families [6] driven by the increased

in life expectancy. Intergenerational cohesion is therefore important for the country to move forward.

Technology has the potential to enhance generational re-engagement in the family and society. In particular, incorporating CUIs with Singlish designed for children can improve intergenerational understanding and bridge the generation gap. Parents can use CUIs to educate children about the origin of Singlish, the differences between the forms of Singlish and English and the meaning and usage of Singlish in different conversational contexts as illustrated in Table 2 and 3.

Table 2 shows an excerpt of a child performing a query to the CUI by asking *What does Eh means?* In responding to the query, the agent engages the child in a dialogue by either showing pictures, illustrating stories from the Singlish word or suggesting informational links such as reference links to sitcoms. Such is an example of a voice-controlled personal assistant to support understanding of sociolects in children and improve intergenerational communication.

Evolving families

Transnational marriages in Singapore are also on a rising trend with one in four citizen marriages involving a non-resident spouse [7, 8].

Unlike traditional marriages, intercultural marriages result in bicultural children [9]. Children who were surrounded by two distinct cultures may feel pressured in understanding and embracing their parental cultures of origin. Identity creation can thus impact children born in binational households.

1	Child:	Today, my friend said <i>Alamak</i> when she dropped her food on the floor.
2	Agent:	<i>Alamak</i> is an expression used to display alarm or dismay. In English, we say <i>Oh, no</i> or <i>Oh my gosh!</i>
3	Child:	What is the origin of the word?
4	Agent:	<i>Alamak</i> is derived from the Malay language. Due to the different races and culture in Singapore, Singlish is a combination of the different languages and dialects.
5	...	<pictures provided>

Table 3: Illustration of how the agent explains the origin of the Singlish word with pictures.

In the same vein, developing CUIs with sociolect allows parents with different cultural backgrounds to promote their own cultures and maintain their child’s interest into belonging to both cultures. This allows children to reconnect to their parental roots and better fit into the local culture.

Other evolving families include expatriates and their family members (children) while living abroad in Singapore. Integrating and adjusting into the local culture may not be seamless [13] especially for children who are enrolled into international schools. This is because exposure to sociolect in international schools may be lower compared to children from local schools. CUIs with sociolects can help these children to connect, adjust and reintegrate into the local culture.

Issues and Challenges

Designing CUIs with sociolects

Most CUI response to general conversational input, questions and commands. They do not look for synonyms and homonyms in talks and exclude humor [1] and tones. Homonyms are important for sociolects like Singlish. An example of a homonym typically heard in Singlish is *Orh* and *Or* in English. The first is a short expression akin to ‘Ok/I understand’ while the latter is not. Tones on the other hand are equally important too. Different tones convey different meanings and feelings to Singaporeans. Table 4 illustrates an example in which adding a word to ‘can’ with a correct tone can bring nine different meanings to ‘can’ in Singlish.

Singlish	English
Can <i>ah?</i>	Can you?
Can <i>la!</i>	Can
Can <i>leh...</i>	Yes, I think so
Can <i>lor</i>	Yes, of course
Can <i>hah?</i>	Are you sure?
Can <i>hor</i>	You are sure then
Can <i>meh!</i>	Are you certain?
Can <i>can</i>	Confirm
Can <i>liao</i>	Its already done

Table 4: Illustration on how different tones convey different meanings and feelings in Singlish.

Existing CUIs only recognize words or ‘scripted words’ but not homonyms and variability in tones. Both of which plays a part in Singlish as they convey different emotions to Singaporeans. Thus, when designing CUIs for sociolects, tones and words detection have to be accounted for. When spotting Singlish keywords, Singlish words can be extracted from the input by the interlocutor to cross-checked against a list of Singlish lexicon.

Using voice as an interaction paradigm can also help to address any interface difficulties when identifying tones and words variability. When it comes to sociolects, they are very much dependent on how we speak. Hence, voice is easier to interact with than keyboard-based interfaces and have lower barriers to entry for children compared to screen-based interfaces.

In addition to the design of CUIs with sociolect, it is important to address CUI experience over time. As the demographics of the community changes, slangs and sociolects may change. How should CUIs with sociolects

change and better adopt to the new variant language over time?

Designing CUIs for children in home settings

Most CUIs in homes are designed for simple and administrative functions, less of an educational and interactional role. CUIs with sociolects should be designed with and for children with the aim of bridging intergenerational communication in the family and promoting cultural awareness.

When interacting with children, CUIs that responds to children's queries through illustration of pictures and stories, provide them with a better understanding of the context of Singlish used in the community. Children also naturally respond to illustrations better from their visual appeal.

Folstad and Skjuve [2] showed that positive user experience included how people are appreciative on how the Chatbot complemented its textual answers in the chat with links to more information. Drawing from this study, we can incorporate informational links such as reference links to sitcoms into CUIs with sociolects. As CUI interaction is fundamentally different from human interaction [3], informational links to sitcoms bring out the essence and flavor of Singlish through comedy and humor, providing more contextual understanding of sociolect to children.

Additionally, in homes, parents often faced the dilemma of not wanting to discourage their children to use Singlish but also wanting them to speak English. On one hand, Singlish is an undeniable part of our national identity and can help children to develop their socialization skills when communicating with the local

community. On the other hand, Singlish is seen as "bad English" [11]. Using CUIs with Singlish and other sociolects is an innovative way to educate children that Singlish is not English, and it does not replace English.

Lastly, in binational households or children whose parents are expatriates, relocation brings about transitional issues such as adjustment integrating into the host country. At the beginning, children may not be acceptive and receptive to learn about the local culture. Thus, designing CUIs with sociolect for children should have a focus on how children could be assisted during their adjustment process.

Conclusion

Aging population and the rising trend of heterogeneous families signifies an important implication for CUIs to incorporate sociolects. Based on these demographic trends, it is timely and important to transform the role of CUIs to more than just instructional and command functions. More importantly, CUIs with sociolects can serve as an educational and interactional resource to promote cultural awareness in children.

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