

Smartwatch-based Topic Suggestions to Enrich Casual Conversations in Awkward Encounters

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ABSTRACT

Encounters with casual acquaintances are common in our daily lives. In such situations, people are sometimes unable to find an appropriate topic for conversation, and as such, an awkward silence follows. However, we believe that this awkward encounter can be an opportunity to build a good relationship with the acquaintance through a brief conversation if an appropriate topic is discovered. In this study, we examined a method to enrich casual conversations for an unintended encounter by following three strategies. (1) an online questionnaire survey that involves 10,750 participants to determine how they experience awkward encounters. (2) the design and implementation of a smartwatch-based topic suggestion that relies on finding a commonality in the users' video-viewing histories. (3) demos and semi-structured interviews that involves 15 participants to evaluate this approach. This investigation demonstrates that this novel approach can help users overcome the awkwardness of conversations with casual acquaintances.

CCS CONCEPTS

• Human-centered computing → Collaborative and Social Computing → Empirical Studies in Collaborative and Social Computing

KEYWORDS

Face-to-Face Communication, Awkward Encounter, Smartwatch, Video Content

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1. INTRODUCTION

Having good communication skills, including people that you are not familiar with, is important for your quality of life [29,30]. In order to have good communication skills, conversations play an important role [4]. To build a good relationship through conversations, people create opportunities for conversation.

On the other hand, we experience unintended encounters with others daily. If you are an office worker, a typical situation is an encounter with a colleague in a hall when waiting for an elevator to come. When people meet someone they know, they feel like they have to communicate with him/her [6]. If the counterpart is a person that is familiar to you, you can easily start an enjoyable conversation. If he/she is just a casual acquaintance, on the other hand, you may just greet the person and stay silent because of the absence of an appropriate topic to talk about. This awkward silence can be very uncomfortable [15].

We believe that even during these awkward encounters, there is a chance to establish a good relationship with the counterpart. For example, if you find that you and the counterpart are enthusiasts for the same lesser-known singer through a brief conversation, you will suddenly feel familiar with the counterpart. Even if there is not such happy discovery, a small conversation about a common experience will prevent an awkward silence and make one feel closer to the counterpart to some extent. However, it is difficult to find an interesting conversation topic with a casual acquaintance [31], especially if the conversation time is short.

In the field of human-computer interactions, many systems that support face-to-face communications with a stranger or a casual acquaintance have recently been proposed. However, none of these systems focus on small opportunities for awkward communication that we encounter in our daily lives.

In this study, we propose a new method to enrich casual conversations during sudden encounters with acquaintances. Our main contributions are as follows.

- We investigated how often, to whom, in what situations, awkward encounters happen and how people behave during these encounters.
- We designed a method to support a casual conversation in an awkward encounter. In addition, we demonstrate that the method is accepted by users and is effective.

2. RELATED WORKS

Many studies that aim to support face-to-face communication have recently been proposed. One of the typical strategies is to

expose the information for a user [9,22]. Normally, people get close to each other step-by-step through self-exposure by having conversations over time [4]. Systems that expose self-information can provide cues to talk and speed up this process.

Indicating the commonality between users is one specific way to promote self-exposure [5,14]. One reason this type of system works effectively is that people tend to have a positive emotion about any person having some commonality with him/herself [24].

Since social media is commonly used, systems that extract personal data from a user's social media account have been proposed [3,10,19,26]. One of the advantages of this strategy is that the system can use information that is already registered in a user's account. However, other studies point out that in some situations, users hesitate to expose the data that is extracted from their social media accounts in a face-to-face conversation [10,23].

Most existing systems for supporting this type of communication depend on the user's proactive willingness. However, there are semi-compulsory communications regardless of a user's willingness, such as a conversation with an acquaintance in a sudden encounter [6]. In addition, it is unclear how well a communication support system can work in these situations and whether users want to use the system.

3. ONLINE QUESTIONNAIRE

This section describes an online questionnaire survey that was conducted to determine how people encounter awkward conversations in their daily lives.

3.1. Procedures and Conditions

We asked subjects to register for an online survey company and obtained answers from 10,750 participants (47.1% were male and 52.9% were female). Their ages ranged from 20 to 59 (the average was 40.52) and all participants lived in Japan. All participants were rewarded with points that were available in the research company's community, which equated to 5–10 yen. The median time for completing the survey was 237 s.

3.2. Questions and Results

3.2.1. Frequency. First, we asked participants, "How often do you experience an awkward encounter in your daily life on average?" The results are as follows: 5.8% of the participants answered "more than once a day," 7.5% answered "once a day," 12.0% answered "once every two or three days," 13.8% answered "once a week," 7.5% answered "once every two weeks," 11.9% answered "once a month," 6.1% answered "once every two or three months," 22.9% answered "less than the above," 11.9% answered "not at all," and 0.6% answered "other."

Figure 1 displays the results by gender and age. The X-axis shows the eight categories that obtained by dividing the participants according to gender (male or female) and four age groups (20–29 years old, 30–39 years old, 40–49 years old, and 50–59 years old). The Y-axis shows the frequency of each answer. The number above each bar shows the total number of answers in each category. As indicated in the graph, younger participants appear to experience awkward encounters more often than elderly

participants. In addition, males reported that they experience awkward encounters more often than females.

The 9,469 participants who did not answer "not at all" to the above question were asked the following questions about their most recent awkward encounter.

3.2.2. Behavior. We asked the participants, "How did you act during your last awkward encounter?" To this, 37.3% of the participants answered "having some conversation," 45.9% answered "just giving a greeting," 5.4% answered "leaving there before the counterpart noticed me," 8.0% answered "ignoring the counterpart," and 3.4% answered "other."

3.2.3. Situation. We asked the participants, "Where did the latest awkward conversation happen?" The answers were provided as an open response. The answers were analyzed by performing a morpheme analysis, and the words used most often were extracted. The following are the top 10 words that indicate specific sites or functionalities: "elevator" (1,302 times), "office" (909 times), "workplace" (736 times), "neighbor" (466 times), "lounge" (463 times), "company" (444 times), "super market" (370 times), "train" (317 times), "rest room" (276 times), and "apartment" (242 times).

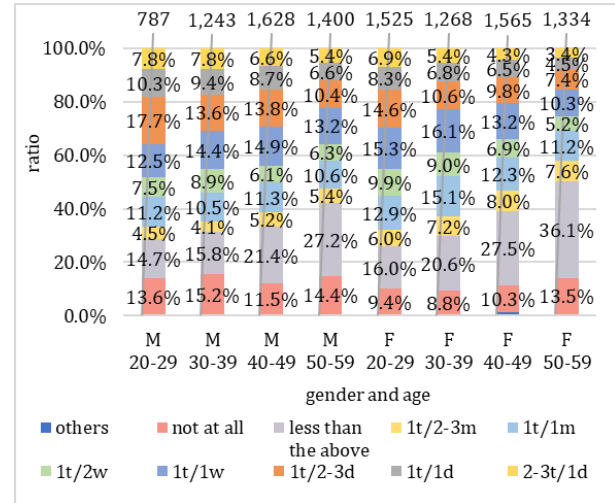


Figure 1: Frequency of encountering awkward conversations.

The results of the web questionnaire are as follows. First, 39.1% of the participants had trouble finding a conversation topic during an awkward encounter more than once per week. Therefore, the issue of awkward encounters needs to be addressed. Second, at least 83.2% of the participants have the intention of giving a greeting to the counterpart. Therefore, there is a possibility of giving people a push to having a conversation or improving the conversation by suggesting an appropriate topic. Third, the sites are diverse. Therefore, our topic suggestion should be available anywhere, instantly, and it can provide a casual conversation topic that is easy to share with anyone.

4. DESIGN

We designed a way to enrich conversations for awkward encounters. This technique demonstrates a commonality in the

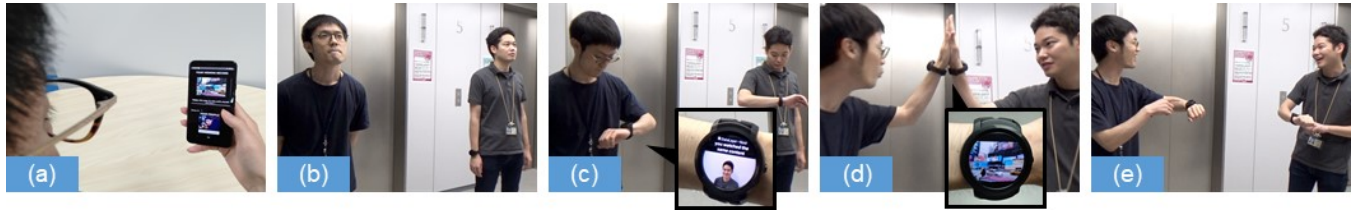


Figure 2: Smartwatch-based topic suggestion using the video viewing history to enrich casual conversations.

viewing histories of the video content between users as a casual conversation topic with a smartwatch. The users can use this information as a stepping stone to start a conversation.

To provide the user information for the video viewing history, a smartphone and a smartwatch are used. The roles of the smartphone are as follows. (1) To collect the user's viewing history of the video content from other video applications and register them as candidates for conversation topics. (2) To detect the physical proximity with another user based on the signal amplitude of the Bluetooth Low Energy (BLE). (3) To exchange the two users' viewing histories, compare them, and detect the same content. In addition, the roles of the smartwatch are as follows. (1) To notify the user of the existence of the same content in their viewing histories and display it. (2) To detect the users' gestures based on changes in its accelerometer values and use them as a trigger to display the data.

Figure 2 describes the sequence of how our method works. There are two parts in this sequence: the preparation part and the encounter part. In the preparation part, (a) a user obtains the video viewing histories from other video apps and then registers them as candidates for conversation topics. In the encounter part, (b) when the user gets physically close to another user, their smartphones exchange information and they can compare their viewing histories automatically. (c) If there is a match for the same content, each smartwatch sends a notification, including the icon of the counterpart, to its user to notify the existence of the same content. (d) If they want to know what content was matched, they "high five" each other. Then, their smartwatches detect this motion and show the detailed data of the content. (e) The users can use the information as a stepping stone for a conversation.

There are two key features for this approach. First, it uses a smartwatch as an interface to support a conversation. Although a variety of devices have been developed and are used to support face-to-face communication [1,7,8,12,13,17,26], we adopted the smartwatch as an interface based on the following two reasons. (1) Since our target is a sudden encounter that can occur anywhere and at any time, a device that is widely used and is accepted by the public is preferable. (2) A notification from a smartwatch is easy to notice [11,27] and it can be checked instantly [28].

Only a few studies have focused on using a smartwatch to support face-to-face communication [9,18].

Second, it uses the users' viewing histories of video content as a resource for conversation topics. When you encounter casual acquaintances in daily life, sometimes you may have an interest to get to know the counterpart; however, sometimes you just want to overcome the awkward silence and do not want to get close to him/her more than necessary. In order to adapt to any situation,

a casual and useful conversation topic is desired. Here, we believe that the video content that they watch can become an appropriate topic. In fact, Svensson et al. [32] studied the daily life of seniors and demonstrated that video content is one of the typical stepping stones to start a conversation when encountering other inhabitants.

There is no study that focuses on the user's video consumption to support offline communication whereas many studies have focused on an online method [2,16,20,25].

5. DEMO AND INTERVIEW

To evaluate the proposed design, we implemented it as a wearable system on a smartphone (Pixel 3, by Google) and a smartwatch (TicWatch E2, by Movboi). Then, we conducted its demo and semi-structured interviews with several subjects.

5.1. Procedures and Conditions

For this portion of the study, 15 participants (10 males, 5 females) were recruited from among the participants who had answered the questionnaire. Their ages ranged from 28 to 56. Their occupations included being office workers, part-time workers, housewives, officers, self-employed workers, and temporary employees. All the participants were rewarded with 4,000 yen. The experiment was conducted in the research company's office room. A session of the experiment consisted of an introduction, a demo, and an interview. One participant and the interviewer participated in each session. One session took about 30 min.

5.1.1. Introduction (about 5 min). The purpose of the proposed system to enrich a casual conversation during sudden encounters and the procedure of usage were explained to the participants.

5.1.2. Demonstration (about 5 min). To demonstrate the app, the interviewer played the role of a counterpart. The demo proceeded with the scenario as described in Section 4, except for the following. (1) The participant searched for and watched arbitrary video content with the YouTube app, and this was registered in the viewing history. This content was used for the subsequent matching step. (2) A notification was triggered by the interviewer in which a button was pushed on the demo controller, instead of the proximity of the user and the interviewer being used.

5.1.3. Interview (about 20 min). At first, the participants described their latest awkward encounter. Then, they answered the questions that are described in the next section. All interviews were conducted in Japanese.

5.2. Questions and Results

5.2.1. Effect of Knowing the Existence of the Same Viewing History. We asked the participants about whether it was helpful

for having a conversation in an awkward encounter to know that they and the counterparts have the same viewing history. As a result, all the participants answered that it was helpful. The following are extracts of the representative answers. *"I'm happy if I know that I and the counterpart watched the same video content (Participant 11/Male/34-year-old)."* *"It is really difficult for me to find a topic for a neutral conversation when running into a mom friend in a supermarket, so this information is helpful (Participant 13/F/55)."* From these comments, it seems to make the user feel close to the counterpart when he/she knows they have the same video viewing history. It also helps a user that is suffering from finding an appropriate topic to start a neutral, casual conversation.

5.2.2. Acceptability of Using a Support System in an Awkward Conversation. Although it is helpful to know that the user has the same viewing history as the counterpart, it is unclear whether people accept using a communication support system in an awkward encounter. To determine this, we asked two questions. First, we asked the participants about whether they believe it is strange to partake in a conversation that is triggered by a notification. As a result, all participants answered, at least, that it was not strange. In addition, several participants said that matching relieves their anxieties. *"Only content that the counterpart registered as public are used for the matching, so the matching means he/she is open to talk about this topic. Therefore, I can talk to him/her at ease (Participant 6/M/47)."* Second, we asked participants whether they felt that it is strange that a counterpart talked to him/her because of a notification. As a result, all participants answered that it was not strange. *"It's better than having nothing to talk about (Participant 9/M/29)."* In addition, several participants answered that they were happy with the counterpart's effort to have communication. *"If the counterpart makes the effort to find a topic and tries to communicate with me, of course I want to respond to it (Participant 2/F/58)."* From these comments, use of a communication support system in an awkward encounter seems to be acceptable.

5.2.3. Effectiveness of Hiding a Notification for the Reason of Matching. Previous studies show that people have a concern about the automatic exposure of their personal data to others [10,23]. Regarding this point, Chen et al. studied the effect of a notification without indicating the reason for the matching [3]. They matched the participants in an academic conference based on their profiles and notified them who were the matched ones without revealing the reason. They showed that such a notification can promote a conversation between the participants that is strange to each other. Our design of notification hiding the title of the matched content refers to Chen's design. However, because Chen's system targets the use in a specific event in which the participants are ready to be matched by a system whereas our system targets daily use, it is unclear whether the same notification style is suitable. Therefore, we asked participants about what they thought about the notification without the title of the matched content in comparison to one with only the genre, and one with the title. As a result, 10 participants preferred the notification with the title, four preferred the one with the genre, and only one preferred the one with no hint. However, 13 participants indicated that a notification without the title or genre was still helpful. From this

result, a notification without the reason can be a stepping stone to start a conversation, even in a daily encounter.

5.2.4. User's Interest in Rarity of Matching. According to Mayer et al., social matching app users tend to be more interested in the matching with anyone who has a rare characteristic, such as a rare job [21]. From this, we hypothesized that users were motivated more to talk to the counterpart when they knew the matching was based on rare content. Therefore, we asked participants about whether they got more interested in the matching if the notification indicated that the content was rarer one (e.g. a less viewed video in YouTube). As a result, the answers can be categorized into two groups. The answers of eight participants were categorized into one group in which the rarity affected their interest. *"A person who shares rare content may have similar values as me in some aspects. I want to try to talk with him/her (Participant 11/M/34)."* The answers of seven participants were categorized into another group in which the rarity did not affect their interest. *"It is not as important whether the content is rare in general as long as the counterpart and I share it (P3/M/55)."* From these comments, at least for some users, it seems that rarity is unimportant; however, by having something in common, this is important to overcome an awkward encounter.

5.2.5. Switching Problem. Several participants pointed out that there are cases where the user did not want to converse with someone they encountered with; thus, they wanted a system to stop a topic suggestion at that time. One of the simplest ways to avoid receiving a notification is for the user to turn off the system manually on their own. In this case, however, when and how to turn off the system is a problem. Because these encounters happen unexpectedly, it is difficult for the user to turn off the system before encounters happen. If the user turns off the system in front of the counterpart, on the other hand, this will have a negative effect on the counterpart's feelings. Therefore, we need to develop a mechanism to stop topic suggestion at an arbitrary time without being noticed by the counterpart.

6. CONCLUSION

In order to design a new method to enrich conversations with an acquaintance during an awkward encounter, we conducted an online survey, implemented a mobile system, and performed demos and interviews. We found that this method can enrich the conversation by showing the commonality in the users' viewing histories of the video content via their smartwatches.

To enhance this idea, we will study the following improvements. Firstly, we will improve the matching rules from current simple id-based one to content-based one. This improvement allows to include more practical situation such as the same content on the multiple video platforms having their own ids. Secondly, we will enable users to select targets to expose their viewing histories. For example, this selection is to expose their viewing history data only to those who having the similar preferences, which will bring more risen conversation and may be practical. Then, we will conduct verification test in an actual field to identify the effectiveness of our ideas.

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