

Enhancing a Conversational Agent with Social Cues: An Investigation into the Impact of Shared Identity and Goal Setting

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Abstract

We investigate whether certain social cues that are known to be helpful in human-human conversation, can also have a positive effect in human-computer conversations. We are developing speaking conversational agents who talk to users about their daily life enabling them to gain deeper insights into their overall well-being. Previous studies have shown that self-disclosure by users can relieve stress, and agents can offer an anonymous listening ear when talking about potential sensitive topics. In this study, we aim to better understand whether self-disclosure can be facilitated by two verbally expressed social cues, Shared Identity and conversational Goal-setting in a HCI context. We discuss our experiment in which participants talked about their daily life with our voicebot, using a 2x2 between-subjects design with and without the social cues Shared Identity and conversational Goal-setting. We measured whether the social cues improved trust, common ground, social attraction and self-disclosure by the user. The results showed that Shared Identity significantly increased social attraction and common ground but did not significantly influence trust. Neither Shared Identity nor Goal-setting directly influenced self-disclosure. Although Shared Identity did not directly influence trust, our results showed similar dynamics to those in interpersonal relationships regarding the essential roles of trust and shared identity in establishing common ground. Trust significantly predicted perceived common ground only when shared identity was present. Our results showed that adding Shared Identity is also a suited social cue in a HCI context to improve common ground which is fundamental in meaningful conversations. For effective Goal-setting, more research is needed into design and implementation of conversational Goals as it turned out that users perceived the Goals differently than anticipated.

Keywords

Conversational Agents, Spoken Dialogue Systems, Shared Identity, Conversational Goal Setting, Social Cues, Self-Disclosure, Social Perception, User Experiments

1. Introduction

Humans naturally rely on social cues during interpersonal interaction [1] and interaction with computers [2], ranging from physical cues like gender, smile, gesture, voice variations, facial expressions, to verbal cues to understand their conversation partner. While previous research in human-human interactions has demonstrated that social cues can influence social interactions in different ways, such as enhancing self-disclosure [3], enhancing social perception [4], or building rapport [5, 6], the potential of some important social cues, such as shared identity and goal-setting, remains under-explored in human-agent interactions. This study seeks to bridge that gap by examining how these social cues, shared identity and goal-setting, can be leveraged in conversational agents to enhance self-disclosure, trust, social attraction and common ground.

We are developing speaking conversational agents who talk to people about their daily life and welfare to reflect on their own well-being [7]. Such online conversational agents (CAs) are easily accessible and can provide a confidential space [3], which might be particularly appealing for people who are hesitant to talk about personal issues or who are concerned about stigma or discrimination [8]. In addition, some people may find digital interaction less intimidating than interacting with a

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human, leading to an increased willingness to self-disclose and share personal thoughts and feelings [9]. Understanding how self-disclosure can be facilitated in interactions with CAs is essential for designing systems that support meaningful conversations, whether for personalized user experiences or social connection.

Self-disclosure, the act of verbally sharing personal information with another person [10], plays a crucial role in social interactions and encourage relationship building [11]. While self-disclosure can foster meaningful social relationships, discussing sensitive topics can be difficult, and not everyone has access to a supportive person to talk to. In today's increasingly digital world, individuals are turning to digital platforms and conversational agents (CAs) to engage in social interactions.

This study focuses on the impact of shared identity and goal-setting, shown to be relevant and effective in human-human conversations [12, 13, 14, 15, 16] on self-disclosure, trust, social attraction and common ground in human-agent interactions. Shared identity, defined as a sense of belonging to a social group [17], has been shown to foster relational closeness and increase perceived common ground in human-human communication [18]. Similarly, goal-setting can shift the focus of conversations to specific objectives, potentially encouraging self-disclosure [10]. While these social cues have been researched in human-human interactions, their role in CA interactions remains underexplored.

To address this gap, this study aims to address the following research questions:

- **RQ1:** What is the effect of shared identity on self-disclosure, trust, social attraction and common ground in conversations with a CA?
- **RQ2:** What is the effect of goal-setting on self-disclosure conversations with a CA?
- **RQ3:** What is the combined effect of shared identity and goal-setting on self-disclosure, trust, social attraction and common ground in conversations with a CA?

To answer these questions, we conducted a 2x2 between-subjects experiment using a Dutch-speaking, non-embodied CA named Babbelbot. Participants were drawn from various social groups, including students, young professionals, and hobby-based communities. Our aim was to examine how shared identity and goal-setting influence self-disclosure, trust, social attraction and common ground in conversations with the CA.

Our main contributions are:

- a design and implementation in the voicebot dialogue and architecture to integrate two social cues (shared identity and goal setting) in its conversation;
- an evaluation of the effect of these social cues on disclosure and an evaluation of shared identity through social perception such as trust and social attraction;
- we show that implementing shared identity in conversations has a positive effect on human-computer conversations.

In the next section of the paper, we discuss the related work that underpins these research questions. We then describe the methodology used, present our results, and conclude with a discussion of the findings and future research directions.

2. Background

Feine et al. [16] developed a comprehensive taxonomy of social cues for CAs. A social cue for a CA is “a cue that triggers a social reaction of the user towards the CA” [16, 2].

Feine et al. [16] describes the emergence of a social reaction in a social cue. The process begins with a noticeable feature, such as the CA's voice or appearance (the cue), which is then interpreted by the user, transforming it into a social signal. This interpretation can, in turn, lead to a social reaction, such as assumptions or changes in behavior. For example, if a CA uses a male voice (the cue), the user may interpret this as an indication of the CA's gender (interpretation), leading them to apply gender-related stereotypes (social signal), and causing the user to interact with the CA in ways that reflect those biases

(social reaction). Thus, the choice of the CA's voice can become a social cue, influencing how the user perceives and engages with the agent.

As mentioned before, one potential social reaction in interpersonal communication can be a change in self-disclosure. In this context, self-disclosure, or the act of revealing personal information to others, is a complex process that is influenced by various factors such as personality, gender, social goals and social perception [19].

Omarzu [10] suggests that the decision to self-disclose is influenced by a balance between the perceived risks and rewards of different types of information. Personal characteristics of both the discloser and of the listener, such as gender and personality, as well as situational factors and the individual's social goal, all influence the reward and risk of different types of disclosure behaviour [10, 20].

Understanding the dynamics of social cues and social reactions in conversations with CA's can help in designing agents that encourage open self-disclosure while minimizing risks and maximizing rewards.

2.1. Conversational Goals

According to Derlega and Grezelak [21] there are different social goals that could motivate self-disclosure, including the pursuit of social approval, the desire for intimacy, the need to relieve distress, the desire for social control, and the need for identity clarification. The pursuit of social approval is the 'default' goal when no other social goal is clearly present [22]. This means that people tend to disclose information that presents a socially acceptable image of themselves. Once an individual has identified a specific goal, there is a range of strategies to choose from to achieve that goal: In some cases, self-disclosure may be the most effective approach, while alternative strategies may be more suitable in other situations [10].

In an experiment by Quattrone and Jones [23] (through Omarzu, 2000) participants were asked to convince a 'director' to cast them for a film. When told that their success depended fully on the interview with the director, they were more inclined to disclose negative information about themselves to win the part (e.g., "I'm really stingy, just like Scrooge"). This experiment illustrates the entanglement of social goals and the balance of perceived risks and rewards in self-disclosure. Participant's willingness to share negative information to achieve a goal, shows how disclosure behaviour changes based on shifting interaction goals [10, 23].

As mentioned, we aim to create a CA that aids people in managing their well-being by making people aware of what makes them happy and healthy. One of the goals apparent in such a situation could be the need to relieve distress, as well as the need for identity clarification to gain insight into the person and their stressors. When an interaction goal is explicitly set, it provides cues about what is expected in the conversation and influences the perceived risks and rewards associated with disclosing information. In this way, goal-setting in conversations with CAs can act as a social cue, specifically a verbal content cue, potentially encouraging greater self-disclosure by shaping the user's perceptions of what is acceptable to share. This verbal content cue could then potentially result in a social reaction such as more or less self-disclosure, or in a different social perception of the CA.

2.2. Shared Identity

Clark et al. [18] conducted a series of semi-structured interviews to understand what attributes people find important in human-human and human-agent conversations. A key finding was that establishing common ground was considered an essential part of good conversation. According to Rączszek-Leonardi et al. [24] common ground is "most often understood as the sum of mutually known beliefs, knowledge, and suppositions among the participants in a conversation" (p. 1). Building on this, Clark et al. [18] found that discovering shared interests and traits of each other helps deepen conversations and strengthen relationships, as these shared aspects contribute to common ground.

Clark et al. [18] identified 2 essential elements for common ground to be established, trust and shared identity [18]. Neville et al. [17] describe shared identity as "a set of people who view each other as members of a common social group. In colloquial terms, it refers to a sense of 'we-ness'". People

within such groups are united by being associated with a common category. For example, soccer supporters form a shared identity around their favourite soccer club. Shared identity contributes to the establishment of common ground in interpersonal conversations and fosters a sense of relational closeness [18].

Shared identity calls for the need of perceived similarities that bind people into that collective 'wholeness'. These perceived similarities play a crucial role in fostering a sense of connection between people. As Lurings [25] notes, such perceived similarities positively influence social attraction [26, 27], defined as the positive feeling of liking another person [28, 29]. Building on that, shared identity is related to the characteristics of both the discloser and the listener [10]. It often provides a foundation for conversation by providing topics and content for the conversation [18], and can enhance trust in human conversations [12, 30, 13].

To summarize, establishing common ground in conversations requires both trust and shared identity. Shared identity, built through perceived similarities and developed over time through conversation, plays a crucial role in fostering a sense of connection and trust. Given its foundational role in establishing common ground, shared identity can function as a verbal content cue in the context of CAs. Through conversation, a CA can construct shared identity, potentially influencing user behavior, such as self-disclosure, and shaping how the user perceives the CA.

3. Related work

Here we discuss related HCI studies investigating social cues with a focus on self-disclosure. Lee et al. [2020] designed a chatbot with self-disclosure features to perform small-talk with people over a 3-week period. Many participants reported that they felt less embarrassed to disclose to a chatbot than if it had been a human, some participants even reported that they felt they could talk more freely with the chatbot than they could in online settings with other people. Klijsen [2020] also found that people are less scared of judgements from chatbots than from humans. Opposite to Lee et al.'s [2020] findings, they found that the sense of anonymity was an explanation for self-disclosure, as the more anonymous, the more intimate the disclosures were. Wezel et al. [2021] further support this based on their literature review, suggesting that chatbots might enhance self-disclosure and social support, because of perceived anonymity, lack of physical presence, and lack of non-verbal social cues. Clark et al. [2019] highlight that topics in conversations with acquaintances were more focused on current events, shared contexts, or the need to share information about something, rather than very intimate or personal topics. The core driver of these conversations is small talk and transactional dialogue (goal-oriented or task-specific), which can reduce feelings of awkwardness, laying the groundwork for trust. The same pattern is found in human-agent conversations, where social aspects of conversations, including small talk, are likewise reported to be helpful when trying to build trust or rapport [18, 34]. Wald et al. [35] created a chatbot that could be customized by participants along multiple-choice options in a questionnaire. Customization options included gender, skin tone, eye and hair colour, nationality, personal interests for movies/music/books/sports/food, and the chatbot's name. Participants talking to the customized chatbots reported higher scores for anthropomorphism, or perceived humanness, compared to the control group. The direct effect of customization on trust was not significant, however, they found that anthropomorphism had a significant effect on trust, meaning that perceived humanness mediated the effect of customization on trust. The implementation of shared identity can be considered to be a subtle form of customization as it shapes the chatbot interactions to mirror similarities with the user, creating a more personalized interaction.

4. Methods

4.1. Research Design

This study employed a 2x2 between-subjects design to investigate the effects of two independent variables—‘Shared Identity’ and ‘Goal-setting’—on user interaction with the conversational agent (CA), Babbelbot. The design resulted in four experimental conditions: Control (no goal, no shared identity), Goal-setting (goal, no shared identity), Shared Identity (no goal, shared identity), and Goal-setting + Shared Identity (goal, shared identity). The control group served as a baseline to compare the effects of the manipulations in the other conditions. Shared Identity and Goal-setting were operationalized through variations in the conversation content provided by Babbelbot. Except for the presence or absence of these social cues, the conversational structure and topics remained identical across all four conditions.

Participants were first directed to an online questionnaire that assessed their demographic and shared identity information (e.g. ‘Are you a beekeeper?’). This information was used to assign participants one of four shared identity groups (beekeepers, tennis players, students, or young professionals) only if they were assigned to a condition involving shared identity (the shared identity or shared identity + goal-setting conditions). Therefore, participants identifying as beekeepers, tennis players, students, or young professionals were not excluded from the control group. Depending on their assigned condition, they engaged in a conversation with Babbelbot with or without goal-setting and shared identity, before proceeding to the assessment questions. Figure 1 illustrates the sequence of the study procedure and the assignment of participants to experimental conditions.

The experiment used Babbelbot, a voicebot designed to talk to people about their general day to day life via an online interface [36]. We use this voicebot to investigate the impact of social cues in human-agent conversations. Participants received an online questionnaire that directed them to a condition-specific version of the Babbelbot, after talking to Babbelbot the participants returned to the questionnaire to complete it.

The selection of identity groups was informed by practical and feasibility considerations, aiming to achieve diversity in gender and age distribution while ensuring ease of implementation. Beekeepers and tennis players were chosen to represent hobbies with balanced gender distribution, avoiding male-dominated groups such as soccer. Recruitment challenges led to the inclusion of students and young professionals, due to the researcher’s familiarity with these groups, allowing for more meaningful and realistic chatbot interactions. The selection of identity groups may influence the study outcomes, however, given the exploratory nature of this research, the focus was placed on practical and feasibility considerations to establish initial insights into the effects of shared identity and goal-setting in human-agent interactions. Future research could further investigate a wider range of identity groups to enhance generalizability and deepen our understanding of shared identity effects.

4.2. Implementation

The voicebot ran an interface that was accessible via a web-browser. The voicebot used the KaldiNL toolkit [37] for Automatic Speech Recognition of the user utterances and a Dutch TTS module with a male voice. The conversation with Babbelbot was structured into four main parts: the introduction, a Social Cues segment, topics about wellbeing and daily life, and the closing part. In the Social Cues segment, the presence of social cues was determined by the assigned condition; the voicebot would introduce a conversational goal, a shared identity or would continue to the next segment without incorporating either. We operationalised Shared Identity and Goal-setting as follows. For the Goal-setting condition, the chatbot was programmed to set a specific goal for the conversation based on the five goals to self-disclose by Derlega and Grzelak [1979]: relieving distress. The chatbot would communicate its intent to provide a space for the participant to vent, emphasizing its non-judgmental and empathetic nature and say: (translation from Dutch): ‘It is known that it helps to vent your heart. I am here to listen to you, without judgment or criticism. The purpose of this conversation is to give you a place to vent your feelings’. For the Shared Identity condition, the shared identity sections were

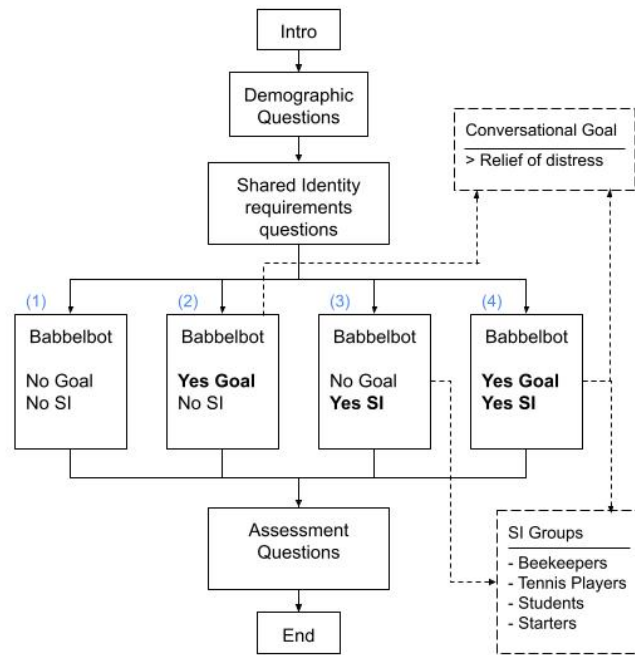


Figure 1: Overview of the study procedure and experimental conditions. SI = Shared Identity. Participants first completed demographic questions and shared identity requirement questions, which determined their assignment to one of four experimental conditions: (1) Control (no goal, no shared identity), (2) Goal-setting only (relief of distress), (3) Shared Identity only, or (4) Goal-setting + Shared Identity. In conditions involving shared identity (conditions 3 and 4), participants were assigned to one of four shared identity groups—beekeepers, tennis players, students, or starters (young professionals)—based on their responses to the questionnaire. In conditions involving goal-setting (conditions 2 and 4), the voicebot set an explicit conversational goal at the beginning of the interaction, emphasizing the relief of distress. After interacting with Babbelbot in their respective condition, participants completed assessment questions to evaluate their experience. The study aimed to investigate the effects of shared identity and goal-setting on self-disclosure, trust, social attraction and common ground.

designed to foster a sense of shared identity between the participant and the chatbot. Depending on the requirements gathered from the survey, the chatbot would introduce a specific shared identity topic; beekeeping, tennis, student life, or being a young professional. Each shared identity topic had a unique set of questions tailored to the specific group¹. Participants in the Shared Identity + Goal-setting condition talked to the voicebot that set a goal at the beginning of the conversation, as well as introduced a shared identity topic.

4.3. Participants

The participants in this experiment were Dutch-speaking individuals aged 18 and over who had access to a computer, laptop, tablet, or smartphone. Participants were primarily recruited from the researcher's personal network, and a university recruitment system for which students received credit for completed participation. 81 participants finished the full experiment and were included in the study. 51.9% (N=42) participants identified as female, 46.9% (N=38) as male, and 1.2% (N=1) as non-binary. The Control and Shared identity conditions both contained 21 participants, the Goal-setting condition contained 20 participants and the goal-setting and Shared Identity condition contained 19 participants. χ^2 -tests showed that gender, age, region, education level, and device used were evenly distributed over the conditions.

¹full dialogues and code are available on <https://gitlab.com/bliss-nl/babbelbot>

4.4. Procedure

The experiment was conducted online in a web browser. Participants were first informed that participation is voluntary and anonymous and that they could stop participation at any time if they wanted to. After indicating informed consent they were asked about demographic info. Then, the participants were shown a link to the Babbelbot, specific to the condition they were assigned to. After the participants talked to Babbelbot they had to return to the questionnaire to complete the second part, after which they were thanked for their participation.

4.5. Evaluation

This study investigates the effect of shared identity and goal-setting on self-disclosure, trust, social attraction and common ground in conversations with a Dutch spoken, non-embodied conversational agent. To assess these effects, participants evaluated their experience with the voicebot using a direct measure for disclosure duration and five self-report measures via Likert-scale questionnaires: Social Attraction, Perceived Trust, Perception of the New Goal, Perception of the Default Goal, and Common Ground.

4.5.1. Survey Measures

The questionnaire items were based on existing validated measures where possible, except for the scales measuring Perception of the New and Default Goals, and Common Ground, which were newly developed for this study. A professional translator ensured accurate translation from English to Dutch.

Social attraction to Babbelbot was assessed using a 5-point scale adapted from Van Wezel et al. [33], based on McCroskey et al. [28]. Trust in Babbelbot was measured using one item on a 7-point scale, from “not at all” to “very much”. Participants responded to the item “How much do you trust Babbelbot?”. This item was adapted from Bickmore et al. [38]. To assess the internal consistency of the newly developed measure, an exploratory factor analysis (EFA) with oblimin rotation was conducted.

The perception of common ground with Babbelbot was assessed using a 2-item 5-point scale ranging from “not at all” to “very much”: (1) “Did you feel that you and Babbelbot had common ground?”, and (2) “Did you feel that you and Babbelbot had similar interests?”. These questions were newly introduced for this study. The reliability of the Common Ground scale was good ($\alpha = .90$). A principal component analysis with oblimin rotation showed a resolution in one factor that explained 90.86% of the variance, with both items having very high loadings on this factor ($=0.953$), indicating that they are strongly associated with the underlying construct the factor represents.

Participant’s perception of social goals were measured using 2 scales newly introduced for this study based on the motives to self-disclose by Derlega and Grezelak [21]: “Did you want to make a good impression on Babbelbot?” reflecting the perception of the default goal of presenting a socially acceptable image as suggested by Baumeister [22], and “Did you feel that you could talk about distress with Babbelbot?” reflecting the perception of the new, explicitly stated goal of relieving distress.

An overview of the questions in each self-report measure, as well as their sources, can be found on Gitlab <https://gitlab.com/bliss-nl/babbelbot>. The reliability of the scales ranged from adequate to good ($.69 < \alpha < .91$).

4.5.2. Direct Measure Disclosure Duration

Self-disclosure is often measured in breadth (number of topics addressed), depth (intimacy level of disclosures), or duration (word count) [10]. This study focuses on disclosure duration, therefore we measure self-disclosure by the participants by counting the number of words in the user utterances averaged over the whole conversation, as well as per discussed topic.² Because goal-setting and shared

²Upon completion of data collection an external offline Automatic Speech Recognition (ASR) system, Whisper (OpenAI; n.d.), was used to produce textual transcriptions of participants’ answers of a higher accuracy compared to the real-time ASR. Using Whisper ASR in post-processing on top of the real-time KaldiNL enhances the precision of the analyses of participant’s

identity, if present, are introduced in the beginning of the conversation, we will also examine their effects over the flow of the conversation. This is done by examining the average disclosure per condition per topic in the questions presented to the participants. A part of the topics were shown in random order to the participants, therefore, these topics will be aggregated and their average will be taken as one point in the flow of the conversation.

4.6. Data Analysis Approach

The following statistical methods were used to analyze the data:

- **Independent t-tests** to compare experimental conditions on Social Attraction, Perceived Trust, and Common Ground.
- **Two-way ANOVAs** to examine potential interaction effects between Shared Identity and Goal-Setting.
- **Mediation analyses** using the PROCESS macro [39] with 5000 bootstrapped samples to assess whether the perception of conversational goals mediated the relationship between goal-setting and self-disclosure.
- **Reliability analysis** (Cronbach's alpha) to assess the internal consistency of the new scales.

5. Results

This section presents the findings regarding the effects of Shared Identity, Goal-setting, and their interaction on the self-report measures Social Attraction, Perceived Trust, and Perceived Goals, and on the direct measure Self-Disclosure.

Table 1 presents the means and standard deviations for all measures across the experimental conditions.

Table 1
Mean and Standard Deviation (SD) of Key Measures per Condition

Variable	Control	Shared Identity	Goal-setting	Both	Total
<i>Survey Measures (Likert Scales)</i>					
Social Attraction	3.31 (0.76)	3.76 (0.54)	3.39 (0.83)	3.63 (0.74)	3.53 (0.74)
Perception of Default Goal	1.78 (0.88)	2.10 (1.00)	2.05 (1.07)	2.22 (1.06)	2.04 (1.00)
Perception of New Goal	2.22 (1.00)	2.10 (1.00)	2.05 (1.28)	2.67 (0.84)	2.24 (1.06)
Common Ground	1.58 (0.75)	1.88 (0.77)	1.50 (0.71)	2.03 (0.98)	1.74 (0.82)
Trust*	3.24 (1.52)	2.67 (1.53)	3.10 (1.59)	3.68 (1.67)	3.16 (1.59)
<i>Conversation Data (Word Count)</i>					
Average Word Count	10.50 (13.72)	17.25 (19.08)	11.46 (7.84)	17.11 (13.20)	14.08 (13.94)
Log-Transformed Count	1.97 (0.77)	2.41 (0.97)	2.19 (0.78)	2.50 (0.96)	2.26 (0.87)

Note. Trust is measured using a 7-point Likert scale, all other survey variables use 5-point Likert scales (1 = very low). Word counts represent the average across all sub-questions within each condition. Log-transformed values are shown for comparison.

5.1. Shared Identity

We analyzed the effect of Shared Identity using independent t-tests on Social Attraction Perceived Common Ground and Trust (**RQ1**).

disclosures.

- **Social Attraction:** Participants who interacted with Babbelbot incorporating Shared Identity reported significantly higher levels of Social Attraction ($M = 3.70, SD = 0.64$) compared to those without Shared Identity ($M = 3.35, SD = 0.79$); $t(77) = 2.15, p = .035$. The effect size was moderate (*Cohen's d* = 0.49), indicating a meaningful but not large impact of Shared Identity on social attraction, suggesting that additional factors may influence participants' perceptions.
- **Perceived Common Ground:** A significant effect was found for Perceived Common Ground, with participants in the Shared Identity condition reporting higher scores ($M = 1.95, SD = 0.86$) than those in the control group ($M = 1.54, SD = 0.72$); $t(76) = 2.28, p = .026$. The effect size was moderate (*Cohen's d* = 0.52), this suggests that Shared Identity meaningfully enhances perceived common ground, but other conversational elements may also contribute to the perception of common ground.
- **Trust:** No significant effect of Shared Identity on Perceived Trust was found ($p > .201$).

5.2. Goal-Setting

To examine the relationship between Goal-Setting and Self-Disclosure (RQ2), mediation analyses were conducted using the PROCESS macro for SPSS with 5000 bootstrapped samples [39]. The analysis explored whether the perception of the new goal (relief of distress) and the perception of the default goal (social approval) mediated the effect of Goal-Setting on self-disclosure. The findings are summarized below:

5.2.1. Perception of the New Goal (Relief of Distress)

- **Total Effect of Goal-Setting on Self-Disclosure:** The total effect of Goal-Setting on self-disclosure was found to be non-significant ($\beta = .0000, SE = .2428, t(76) = .0000, p = 1.0000$). This indicates that introducing goal-setting, without considering a potential mediator, had no significant overall effect on how much participants disclosed.
- **Effect of Goal-Setting on Perception of the New Goal (Mediator):** There was no significant effect of Goal-Setting on the perception of the new goal, relief of distress ($\beta = .1795, SE = .2405, t(76) = .7462, p = .4578$). This suggests that explicitly stating the goal did not significantly alter participants' understanding of the conversation's purpose.
- **Direct Effect (Controlling for the Mediator):** When controlling for perception of the new goal, the direct effect of Goal-Setting on self-disclosure remained non-significant ($\beta = -.1020, SE = .2028, t(76) = -.5031, p = .6164$). This indicates that even when controlling for the perception of the new goal, goal-setting itself did not influence disclosure.
- **Significant Effect of the Mediator on Self-Disclosure:** A significant positive relationship was found between the perception of the new goal and self-disclosure ($\beta = .5683, SE = .0963, t(76) = 5.8991, p < .0001$). This suggests that participants who perceived the conversation goal as 'relief of distress' were more likely to disclose more, regardless of explicit Goal-Setting.
- **Indirect Effect of Goal-Setting on Self-Disclosure:** The bootstrapped 95% confidence interval for the indirect effect included zero ($\beta_{\text{indirect}} = .1020, 95\%CI[-.1662, .3967]$), indicating no significant mediation effect.

5.2.2. Perception of the Default Goal (Social Approval)

- **Total Effect of Goal-Setting on Self-Disclosure:** Similar to the perception of the new goal, the total effect of Goal-Setting on self-disclosure was found to be non-significant ($\beta = .0000, SE = .2428, t(76) = .0000, p = 1.0000$). This suggests that explicitly stating the goal did not significantly alter participants' understanding of the conversation's purpose.
- **Effect of Goal-Setting on Perception of the Default Goal:** Goal-Setting did not significantly affect the perception of the default goal ($\beta = .1795, SE = .2268, t(76) = .7913, p = .4313$). This suggests that participants' perception of presenting a socially acceptable image was not influenced by explicit Goal-Setting.

- **Direct Effect (Controlling for the Mediator):** When controlling for perception of the default goal, the direct effect of Goal-Setting on self-disclosure remained non-significant ($\beta = -.0697, SE = .2287, t(76) = -.3048, p = .7614$). This indicates that even when controlling for the perception of the default goal, goal-setting itself did not influence disclosure.
- **Significant Effect of the Mediator on Self-Disclosure:** A significant positive relationship was found between the perception of the default goal and self-disclosure ($\beta = .3384, SE = .1152, t(75) = 3.3716, p = .0012$). This indicates that participants who perceived the goal as presenting a socially acceptable image were also more likely to disclose information, independent of explicit Goal-Setting.
- **Indirect Effect of Goal-Setting on Self-Disclosure:** The bootstrapped 95% confidence interval for the indirect effect included zero ($\beta_{\text{indirect}} = .0697, 95\%CI[-.1016, .2793]$), indicating no significant mediation effect.

Table 2
Summary of Mediation Analysis Results for Perception of Goals

Path	β	SE	p-value
Goal-Setting \rightarrow Self-Disclosure (Total)	.0000	.2428	1.0000
Goal-Setting \rightarrow New Goal (Mediator)	.1795	.2405	.4578
New Goal \rightarrow Self-Disclosure	.5683	.0963	<.0001
Goal-Setting \rightarrow Default Goal (Mediator)	.1795	.2268	.4313
Default Goal \rightarrow Self-Disclosure	.3384	.1152	.0012
Goal-Setting \rightarrow Self-Disclosure (Direct)	-.1020	.2028	.6164
Indirect Effect (New Goal)	.1020	-	[-.1662, .3967]
Indirect Effect (Default Goal)	.0697	-	[-.1016, .2793]

5.3. Disclosure

A two-way ANOVA on the effect of Goal-setting and Shared Identity on disclosure measured in average word count (log transformed) showed no significant results (p 's $> .160$) (**RQ3**). Separate two-way ANOVAs measuring the effect of Goal-setting and Shared Identity on the wordcounts for each question block individually showed no significant interaction effects (p 's $> .124$) and no significant main effects (p 's $> .086$) except for q-last, the question assessing whether participants had someone to open up to on a regular basis. A two-way ANOVA of shared identity and goal-setting on disclosure in q-last showed a significant main effect of Shared Identity on wordcount ($p = .019$), and no significant main effect of Goal-setting on word count ($p = .346$). Participants that talked to Babbelbot that implemented Shared Identity ($M = 2.35, SD = 1.14$) had a significantly higher wordcount in q-last, than participants that talked to Babbelbot without Shared Identity ($M = 1.59, SD = 1.00$).

Wordcount Decline Over Time. The word count over the time or flow of the conversation per condition is shown in Figure 2. Note that “aggregated topics” aggregates a series of topics presented in random order to participants, with the displayed word counts representing an average over these topics. The figure shows a decline in word count over time until the question assessing the opinion on the conversation. To assess differences in the rate of word count decline across conditions, the difference in word count from q1 to q-last was computed for each participant.

A two-way ANOVA of Goal-Setting and Shared Identity on wordcount decline over time revealed a significant interaction effect ($F(1, 44), p = .015$), but no significant main effects of Goal-Setting ($F(1, 44), p = .429$) and Shared Identity ($p = .294$). A split file on Shared Identity and a one-way ANOVA of Goal-Setting on wordcount decline over time indicated a significant main effect of Goal-Setting among the group of participants where Shared Identity had not been implemented ($F(1, 22) = 8.105, p = .009$), but not among the participants in which Shared Identity had been implemented ($F(1, 22) = 1.136, p = .298$). Participants who talked to Babbelbot where only Goal-Setting was

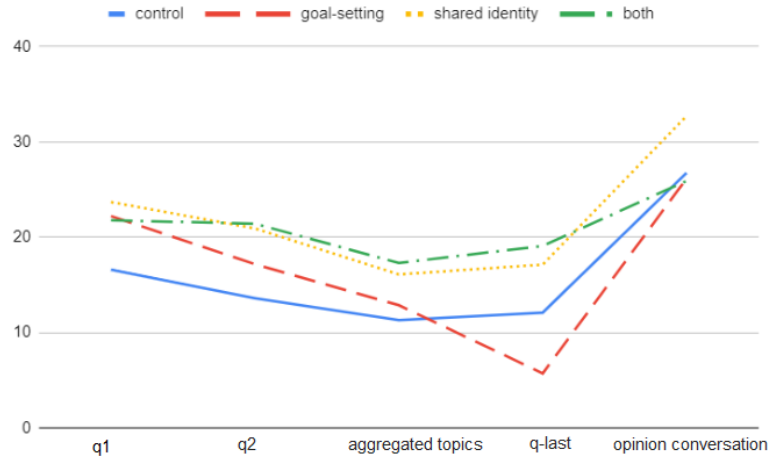


Figure 2: Overview of the average word counts per condition over the flow of the conversation.

implemented ($M = 16.13, SD = 15.39$) had a significantly higher wordcount decline over time than participants who talked to Babelbot where both Goal-Setting and Shared Identity had been implemented ($M = .21, SD = 15.76$). This suggests that the implementation of Goal-Setting is associated with a significantly higher word count decline over time, and that this effect is weakened when Shared Identity is also implemented, making the effect of Goal-Setting on wordcount decline over time non-significant.

6. Discussion

The aim of this study was to investigate the potential of lesser researched social cues, shared identity and conversational goal-setting, to enhance self-disclosure, trust, and social attraction, contributing to the design of more effective CAs. This section discusses the results of our experiments in light of existing research.

6.1. Shared Identity and Social Attraction

Our results showed that introducing Shared Identity in Babelbot significantly increased Social Attraction. This aligns with prior research by Fiebert and Fiebert [40], which suggests that people actively seek similarities when forming social attraction. In line with Neville et al. [17], shared identity is defined as individuals perceiving themselves as being united by a common category. In our study, participants in the Shared Identity conditions engaged in conversations that emphasized shared characteristics or interests with Babelbot. This likely increased the salience of these similarities, thereby fostering a stronger sense of social attraction.

Social attraction, defined as the positive feeling of liking toward another person [28], plays a crucial role in relationship development, as people tend to pursue relationships with those they like [29]. The observed increase in Social Attraction suggests that implementing shared identity effectively facilitated a more favorable perception of Babelbot. These findings underscore the potential of shared identity as a design strategy for enhancing social attraction in human-agent interactions. By strategically integrating conversational elements that highlight commonalities, CAs may become more socially attractive to users.

Although the effect of Shared Identity on Social Attraction was statistically significant, the effect size (*Cohen's d* = 0.49) indicates a moderate impact. This suggests that while Shared Identity is a valuable design feature, its practical impact on user perception is meaningful but not overwhelmingly strong. This finding underscores the complexity of social attraction in human-agent interactions, implying that additional factors also play a role.

6.2. Shared Identity and Common Ground

Our results demonstrate that introducing Shared Identity in Babbelbot significantly increased perceived Common Ground. This aligns with previous research in human-human conversations, which suggests that shared identity plays a key role in establishing common ground [18]. Common ground is defined as the mutually known beliefs, knowledge, and suppositions among conversational participants [24]. The increase in perceived Common Ground in the Shared Identity condition indicates that participants who recognized a shared identity with Babbelbot were more likely to perceive a mutual understanding in the conversation.

The observed effect size for the increase in perceived Common Ground was moderate, this means that additional factors may contribute to this perception, therefore other conversational element may also play an important role in fostering a sense of common ground.

6.3. Self-Disclosure

This study examined the effects of Shared Identity and Goal-Setting on self-disclosure in interactions with Babbelbot. Overall, neither Shared Identity, Goal-Setting, nor their interaction had a significant impact on the total disclosure duration. However, analyzing disclosure across specific conversation topics revealed that Shared Identity led to increased disclosure in the final question of the conversation (q-last), which asked whether participants had someone to open up to and if so, who it was and what activities they did with them. These results suggest that in specific contexts, implementing shared identity can elicit more self-disclosure, particularly in those involving more personal topics.

The increase in disclosure for q-last may also be attributed to the cumulative effect of trust and perceived common ground built throughout the conversation when shared identity was present. This aligns with Clark et al. [18] finding that mutual understanding, trustworthiness, common ground and shared identity are important aspects of conversation. They also found that shared identity fosters common ground in human-human conversations, and that in conversations with friends people rely on built up trust [18]. Our results show that trust significantly predicted perceived common ground only when shared identity was present, in line with interpersonal research by Clark et al. [18], who found that both trust and shared identity are crucial for establishing common ground in interpersonal communication. Our results suggest that in the presence of share identity participants likely felt more connected to Babbelbot, trusted Babbelbot more and, as a result, disclosed more in later stages of the conversation.

However, it is important to note that the direct effect of shared identity on trust was not significant. This suggests that the effect of shared identity on trust may require sustained interactions to develop fully. Future research should further investigate the interplay between shared identity, common ground, and trust in fostering self-disclosure over extended interactions.

Interestingly, a similar question about family members did not show increased disclosure. In this question Babbelbot asked who in your family is most important to you, why and what kind of activities you often do with them. The position of this question in the conversation was randomized. This suggests that the placement of questions within the conversation flow may influence the extent of self-disclosure.

The role of Shared Identity in enhancing disclosure in human-human interactions is already established [18]. Our findings suggest that implementing Shared Identity in CAs may similarly facilitate self-disclosure, particularly in personal contexts, by fostering perceived common ground and trust.

6.3.1. Decline in Disclosure over Time

The results indicate that Goal-Setting alone was associated with a significantly greater decline in word count over time compared to when neither social cue was implemented. However, when Shared Identity was also implemented, this decline was removed, suggesting that Shared Identity might play a role in maintaining engagement throughout the conversation.

This may also explain why disclosure increased in the final question (q-last) only when Shared Identity was present, but not when both Goal-Setting and Shared Identity were implemented. Since q-last appeared at the end of the conversation, the presence of Shared Identity may have contributed to sustaining engagement and trust, leading to higher disclosure.

Future research should investigate more personal topics, in a randomized order, to gain a better understanding of the effect of Shared Identity on different types of topics regardless of placement in the conversation. Moreover, different future research could focus on the engagement over the flow of the conversation and the effect of Shared Identity on disclosure at different points of the conversation, for varying levels of intimacy.

6.4. Goal-Setting

The results indicate that Goal-Setting did not significantly influence the perception of either the default goal (social approval) or the new goal (relief of distress). This suggests that brief goal-setting at the start of the conversation may not have been sufficient to alter participants' perceptions and disclosures in human-agent interactions. In contrast to human-human interactions, where goal-setting can play a crucial role in shaping conversational direction [10], potential inherent hierarchical dynamics of human-agent conversations might lead users to feel more in control, reducing the influence of an explicitly stated goal. A potential explanation for the lack of a direct effect could be that participants perceived Babelbot primarily as a tool rather than a conversational partner, reducing the impact of goal-setting. Moreover, disclosure is a gradual and often trust-dependent process, therefore, goal-setting at the start of one conversation may not be enough to influence self-disclosure behavior effectively throughout the interaction.

Interestingly, the analysis revealed that participants who perceived they could talk about distress (new goal) also felt a desire to make a good impression (default goal), suggesting an overlap in goal interpretation. This indicates that participants may have viewed self-disclosure as a means of social approval, emphasizing the importance of understanding participants' perceptions and the potential interaction between different social goals in conversations with CAs, to enhance goal alignment.

Overall, these findings highlight the complexity of goal-setting in human-agent interactions. Understanding how users interpret and internalize goals is crucial for developing effective CAs that can meaningfully guide user behavior. Future research should explore how goal-setting strategies can be optimized through repeated interactions, dynamic goal reinforcement, and personalization to enhance user engagement and disclosure.

Future research should dive deeper into the nuances of gender in HCI and self-disclosure. Traditional gender norms suggested differences in disclosure patterns between men and women, especially in the context of goal-setting [41]. We propose that such study should focus on placing participants on a scale of 'traditional' femininity and masculinity, allowing for a more nuanced approach that stays applicable as gender norms evolve [42].

A potential reason why the perception of the new goal, relief of distress, only increases when both Shared Identity and Goal-setting are implemented could be that their individual effects are not enough for a significant change, whereas the conjunction of these social cues could create a strong enough social signal for there to be a significant change in the perception of how appropriate or allowed it is to relieve distress for men. This suggests that for men, having clear goals in the conversation and talking about a shared identity regarding work or sports is important to feel they are allowed to relieve distress more, however, for women these adjustments are not fitting or not enough. Future research could explore Shared Identity topics that are traditionally preferred by women and could focus on setting different conversational goals, that might not be inherent of the female gender, to understand the broader scope of possibilities for the implementation of shared identity and goal-setting.

6.5. Future Work

While our findings highlight the potential of shared identity and goal-setting in enhancing user perceptions and interactions with conversational agents, further research is needed in several areas. Longitudinal studies could explore how repeated interactions influence social attraction and perceived common ground over time, providing insights into the sustainability of these effects. Additionally, future implementations could investigate more dynamic and personalized shared identity cues that evolve throughout the conversation, reinforcing users' perception of similarity. Examining different types of shared identities, such as professional versus social affiliations, may further optimize chatbot interactions for diverse user groups. Finally, exploring how goal-setting strategies can be effectively integrated throughout the conversation rather than solely at the beginning may yield better user engagement and self-disclosure outcomes.

7. Conclusion

This study focused on two lesser studied social cues, goal-setting and shared identity in the context of CAs, as both have been shown to be relevant in effective human-human communication, and especially in eliciting self-disclosure.

As a valuable contribution to the growing body of HCI research, this study showed that shared identity in a Dutch spoken non-embodied conversational agent has the potential to enhance social attraction and common ground through social cues.

Goal-setting, while an important part of disclosure dynamics, did not directly influence self-disclosure or the perception of the new and default goals, respectively relief of distress and social approval. This suggests that our implementation of goal-setting in a voicebot may require adaptations to more effectively influence disclosure and to align user's goal-perceptions as intended, laying the groundwork for future research. The results indicate that users may interpret set goals differently than expected or may be influenced by intrinsic motivations. Future research should explore strategies to better align conversational goal-setting with users' expectations and internal motivations.

Future conversational agent development should focus more on user-driven design features that are personalized to the target users, as well as draw inspiration from social dynamics proven to be helpful in human-human communication to elicit self-disclosure and improve social attraction.

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