

Week 7: Interpersonal Communication

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Summary: Interpersonal communication is a fundamental aspect of social interactions that involves verbal and nonverbal messages. The discussion explored the main functions of interpersonal communication, compared the functions of verbal and nonverbal communication, and examined how these functions are aligned with the abilities and skills discussed in the previous week when studying social and emotional intelligence. The discussion also identified the main components of the interpersonal communication process and analyzed the relationship between joint action and social cognition. Finally, the discussion considered the implications of interpersonal communication for building and evaluating artificial social intelligence and highlighted the importance of differentiating interpersonal communication, social intelligence, and other related concepts in order to better understand and measure social interactions.

The following was a list of provided research probes:

1. A significant portion of many social interactions involves communication of verbal and nonverbal messages. This interpersonal communication between dyads and small groups is a relevant facet of social interactions.
 - From your readings, what are the main functions of interpersonal communication? How do you compare the functions of verbal communication vs functions of nonverbal communication?
 - How are these functions of interpersonal communication aligned with abilities and skills discussed in the previous week when studying social and emotional intelligence? Are these functions overlapping? Some of them unique to interpersonal communication? Some of them unique to social intelligence?
2. The interpersonal communication process is a dynamic multimodal process which involves many components (e.g., see Models of Interpersonal Communication). Based on your readings, what would you identify as the main components of the interpersonal communication process?
 - Are all components of interpersonal communication also important when assessing and modeling social intelligence? Would you see some components as “basic communication” that is not as relevant to social intelligence and social competence?
3. Interpersonal communication is a joint process between two or more people (e.g., as discussed in the “Cognitive pragmatics” paper). How does this common ground and joint action process relate to last week reading on social cognition and theory of mind?
4. As we start thinking about building and evaluating artificial social intelligence, what aspects of interpersonal communication will be core to this endeavor? Can we build artificial social intelligence without first modeling interpersonal communication? What are the key components of interpersonal communication needed for artificial social intelligence?

As background, students read the following papers:

1. (Required) Interpersonal Communication, chapter in Handbook on Communication Skills [Berger and Roloff, 2019].
2. (Required) Psychology of verbal communication [Krauss, 2002].
3. (Suggested) Nonverbal signals, chapter Handbook of Interpersonal Communication [Burgoon et al.,

- 2011].
4. (Suggested) Cognitive pragmatics: The mental processes of communication [BARA, 2011].
 5. (Suggested) Turn-taking in Conversational Systems and Human-Robot Interaction: A Review [Skantze, 2021].
 6. (Suggested) Models of interpersonal communication, as part of the book “Interpersonal Communication A Mindful Approach to Relationships” [Wrench et al., 2020].
 7. (Other) Nonverbal communication, chapter in Handbook on Communication Skills [Hubbard and Burgoon, 2019].

We summarize several main takeaway messages from group discussions below:

1 Functions of Interpersonal Communication

In order to understand the role of interpersonal communication in social interactions and its relationship with social intelligence, it is important to explore its functions and components.

One topic that was discussed was the design of a reward function that could incentivize agents to engage in effective communication strategies in a simulation setting. The specific design of the reward function would depend on the objectives of the simulation and the desired behavior of the agents and involves considering the different functions of interpersonal communication that are relevant to the simulation setting. The group identified several key functions:

- One important function, we discussed, was reciprocity, which is the idea that effective communication involves a back-and-forth exchange of information and messages between individuals. In a simulation setting, a reward function could encourage agents to respond to messages in a timely and appropriate manner, which could promote more effective communication.
- We also discussed the importance of considering and differentiating spiritual and material goals. Spiritual goals typically relate to the pursuit of meaning, purpose, and connection, while material goals relate to the pursuit of tangible resources, such as wealth or knowledge. Relational goals, which involve the pursuit of social connections and relationships, were mentioned as an example of spiritual goals. By contrast, attending lectures was given as an example of a material goal, as it involves the acquisition of knowledge or skills that can be used for practical purposes. In designing a reward function, we believed that it may be useful to differentiate between spiritual goals and material goals and optimize the interaction with both type of goals in mind.
- A third concept discussed involved breaking down a larger goal or task into smaller, more manageable parts or sub-goals, and incentivizing the completion of each sub-goal as a means of achieving the larger goal. A well-designed reward function could incentivize agents to navigate each of the different sub-scenarios successfully, which could help to promote effective communication.
- We also talked about the alignment of knowledge between individuals. For communication to be successful, individuals need to have a shared understanding of the information being exchanged. In a simulation setting, a reward function could encourage agents to seek alignment of knowledge and to communicate clearly and effectively to achieve this goal.

In summary, the functions of interpersonal communication are multi-faceted and complex. Effective communication involves exchanging information and messages, building and maintaining social connections, and achieving shared understanding. Understanding these functions is critical to promoting effective communication and social intelligence in a simulation setting or in real-life social interactions.

2 Relationships with Social Intelligence

Interpersonal communication is a subset of social intelligence, as it involves the ability to communicate effectively on a personal level, while social intelligence encompasses a broader range of skills, including understanding social dynamics, adapting to different social situations, and using nonverbal cues. The group also discussed the relationship between fluency and social intelligence, agreeing that while fluency is a

construct of communication, it is not necessarily a component of social intelligence. In other words, one can be socially intelligent without being fluent. Finally, nonverbal communication plays a significant social role, such as in infants babbling to learn to speak. Communication itself was also considered a social activity, but there was some debate whether being social was the same as being socially intelligent.

3 Evaluating Interpersonal Communication

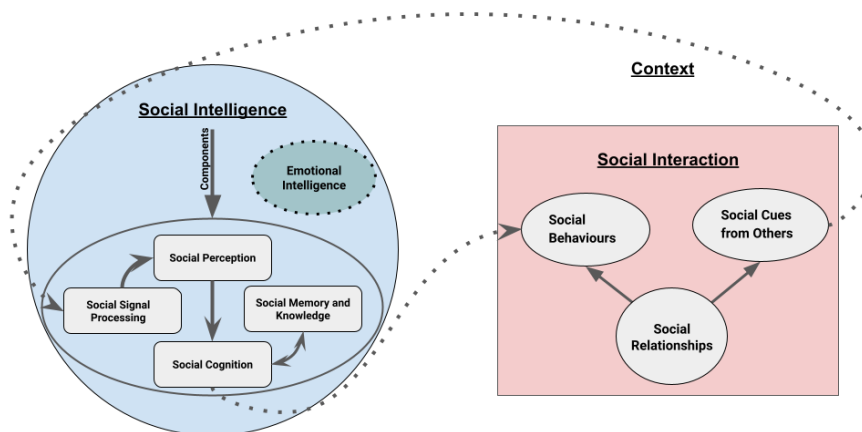
The topic of evaluating social intelligence and interpersonal communication was also discussed. Benchmarking social intelligence is challenging, given the variability in human social behavior and the complexity of measuring against a moving target. The group also considered the utility of differentiating between terms like interpersonal communication and social intelligence, particularly in the context of building artificial agents.

The group emphasized the importance of not making broad claims about social intelligence when presenting work, but rather focusing on specific sub-concepts. They also discussed the value of having a general knowledge of the literature to inform research output and progress. Additionally, differentiating between interpersonal communication and social intelligence can help in defining the end goal, ensuring interpretability, and understanding ability.

4 Relationships Between Social Concepts

The class divided into three groups and each group presented a visual diagram depicting the relationships between the social concepts studied in class so far.

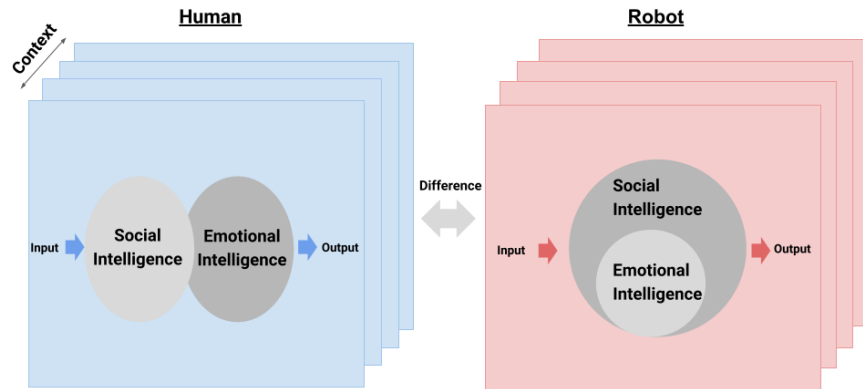
4.1 Group 1



Group 1's diagram focused on social intelligence and its underlying subcomponents that facilitate effective social interactions. Social signal processing, social perception, social cognition, social memory, and social emotion are identified as the subcomponents that make up social intelligence. Emotional intelligence, which encompasses the ability to recognize, understand, regulate, and utilize emotions, is regarded as a critical aspect of social intelligence that interacts with each of these subcomponents.

The group highlighted the distinctions between social intelligence, social competence, and social skills, with social competence and skills referring to the particular abilities required for specific objectives or tasks in social situations. Social intelligence is employed in social interactions, allowing individuals to perceive others' intentions and emotions and produce appropriate behaviors suitable for the given context. Social relationships are a product of social interactions, and the external context also influences how people interact.

4.2 Group 2

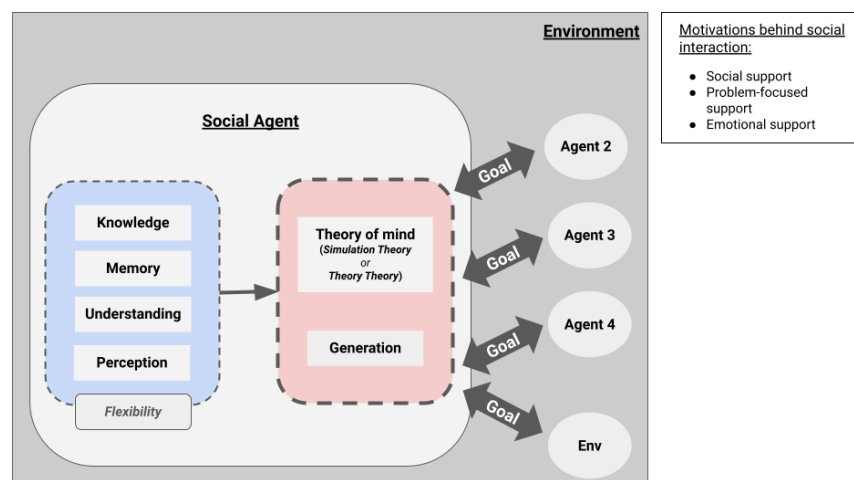


Group 2 examined the interplay between social intelligence and emotional intelligence in human and artificial agents. They presented an argument that these two concepts have some shared and some distinct features depending on whether they pertain to humans or robots. Social and emotional intelligence are partially intersecting for humans, as humans can introspect on their own emotions and disclose them to others or not. This implies that humans have a sense of self-awareness and agency that enables them to regulate their emotions and social interactions.

Conversely, emotions are not self-conscious for robots but only serve social functions such as enhancing communication. This indicates that robots do not have an intrinsic emotional state but only simulate emotions based on external cues and goals. Both types of intelligence operate like functions that take an input from the environment and produce an output in terms of expression or behavior.

However, these functions are context-sensitive and vary according to the situation. For instance, people will exhibit different behaviors when they encounter strangers or friends. This suggests that people can adapt their social and emotional responses based on the level of intimacy and familiarity with others. Similarly, robots can also adjust their expressions and behaviors based on the verbal or non-verbal signals from others.

4.3 Group 3



Group 3 proposed a framework for organizing and categorizing different social concepts that could enable engineers to design a socially intelligent agent. To achieve this objective, they first distinguished between three types of goals that tend to motivate social interactions:

1. Social support, which involves providing companionship and belonging;
2. Problem-focused support, which involves helping others solve their problems;
3. Emotional support, which involves expressing empathy and compassion.

The environment in which the agents interact influences how they apply various aspects of social intelligence. There are four key components of social intelligence that allow the agent to perceive the intentions and emotions of other agents and the state of the environment: knowledge, memory, understanding, and perception. Furthermore, when engaging with other agents actively, an agent must generate appropriate nonverbal expressions, utterances, or behaviors to convey meaning. In this process, the ability to understand how other people are reacting using cognitive mechanisms like theory of mind is essential. This is a bidirectional relationship where both parties and their social goals influence each other and the interaction.

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