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Shared cognition in the translation process: Information processing and meaning production as interactive accomplishments

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ABSTRACT

This article complements the current understanding of cognitive processing in translation by discussing the concept and providing empirical evidence of socially shared, interactive cognition as it emerges in collaborative team translation processes. By analyzing face-to-face interaction between audio-describers, the article shows how cognition is distributed and shared between cognitive agents (in the sense of a tolerable shared interpretation), and how interaction is elementary of this translating system. The article reports on an interaction analysis of video data from authentic collaborative audio description processes. It intends to pave the way for the study of social interactions in translation and interpreting processes from the viewpoint of cognitive processing. The analysis describes different phases of the translation act, from source text analysis to target text production, and details cognition as information processing and meaning production, operations which extend from the personal level of a human being to the intersubjective and cultural-collective ones.

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translation process; social
interaction; audio
description; blindness

Introduction

When cognition is understood to equal a person's individual mind (often the brain), it is quite accurate that "the cognitive processes involved in performing a translation task are not available for direct observation" (Englund-Dimitrova 2010, 407). According to this position, we are only able to observe (to testify with senses, to record, to measure) some external indicators of the cognitive processes, such as typing a text or thinking aloud (e.g. Englund-Dimitrova 2010; Lörcher 2005). The unobservability of cognitive processes in translation can, however, be challenged by paradigms in which cognition is not limited to the individual-mental level but also encompasses the environment in which individuals are embedded (e.g. Muñoz-Martín 2016; Risku and Rogl 2021; Risku and Windhager 2013). Interest in and research on the socio-cognitive interface has existed in translation studies for quite some time, and this interest seems to have followed – also temporally – the development of the

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social turn in cognitive science (e.g. Cooke et al. 2013; Hutchins 1995; Newen, de Bruin, and Gallagher 2018; Resnick, Levine, and Teasley 1991). In the early days of translation process research, Gideon Toury (1995, 13, 54) discusses the interface of the translation act (individual) and the event (social). The relevance of interaction between translating agents is addressed by Paul Kussmaul (1995, 10–12) and later Pavlović (2013) as they propose group/pair discussions, or collaborative translation protocols, as a data elicitation method for translation process research. More recently, several scholars have dealt with the socio-cognitive aspects of translation processes (e.g. Dragsted 2006; Ehrensberger-Dow and Englund-Dimitrova 2018; Nurminen 2020; Risku, Windhager, and Apfelthaler 2013). Furthermore, as cognitive translation studies shifts focus from individual to social and situational cognitive processes, for example, from memory and mental capacity to attentional processes and their management (Muñoz-Martín 2016, 13), research on collaborative translation is increasing, and it is deconstructing the stereotype of “the lone translator” (e.g. Cordingley and Manning 2017; Jiménez-Crespo 2017; O’Brien 2011; Taivalkoski-Shilov, Tiittula, and Koponen 2017). While the focus has previously been on networks and individuals, an interest in the role of social interaction between human agents in (real-life) translation processes is gaining ground (Korhonen and Hirvonen 2021; Sannholm 2021).

To complement the current understanding of both collaborative and cognitive aspects of translation processes, this article discusses a hitherto understudied dimension of translation processes: shared or interactive cognition (see Figure 1). Shared cognition refers to an intelligent system of intersubjective (subject-to-subject) interaction in which translators jointly process information to analyze source material and construct meaning to produce target material, analyze the situation of translation production, solve problems, and make decisions.

This article lays the theoretical and methodological groundwork for the microanalysis of interactive translation processes (see Hirvonen and Tiittula 2018; Risku and Rogl 2021, 486). Relying on data collected in actual translation processes, I conduct a microanalysis of verbal and nonverbal actions, operations, and the tasks and subtasks that make up the translation (see Jiménez-Crespo 2017, 106). I use this to illustrate step-by-step socio-cognitive processing in a face-to-face translation teamwork.

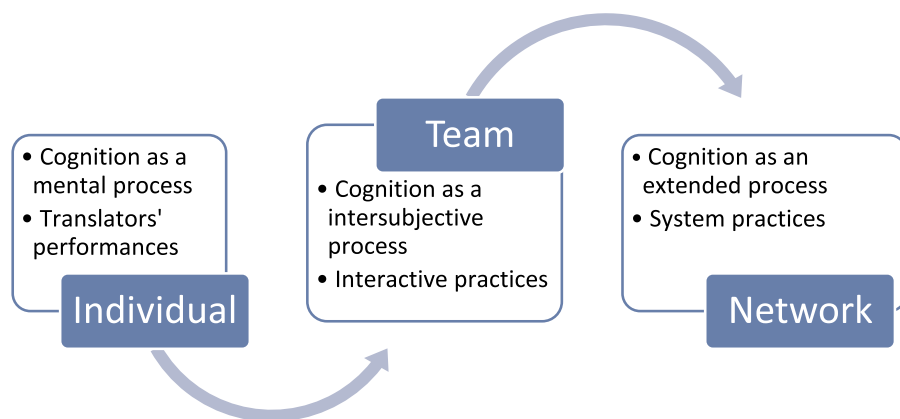


Figure 1. Orientations to cognition in translation studies.

The research reported here was undertaken in a project on collaborative audio description (*Multimodal Translation with the Blind* [MUTABLE], Academy of Finland, 2017–2020), and it attempts to give a detailed explanation of the phenomenon of shared interactive cognition as it emerges during a joint translation act. The context of the study is a specific type of translation, namely audio description (henceforth AD). The audio-descriptive translation task is intermodal translation (from images to language), which requires the reduction of holistic visual information into a selection of abstract or ambiguous categorisations and the re-ordering of simultaneously presented visual representation into sequential units of language (see e.g. Braun 2007; Fix 2005). Together with subtitling, AD is a standard access service in today's creative industries in numerous countries, albeit with disparate distribution quotas due to diverse national regulations. Audio descriptions are typically offered as verbal-vocal insertions to films, videos and theater plays, so that these can also be enjoyed by partially sighted and blind people. In the context of AD, the MUTABLE project collected and analyzed data from a high quality, yet currently marginal, production method. In this method, description scripts are created by teams consisting of both blind and sighted professionals instead of individual describers (see Benecke 2014). Even though the AD teams are visually asymmetrical, with the blind participant unable to perceive visual information, what may seem like a hindrance is in fact a resource for problem-solving.

The article begins with a discussion of the concepts of socially shared cognition and interactive team cognition, discussing their contribution to the extended translation paradigm. After a description of the case of analysis, the selected data, and the methodology, the empirical part analyzes how teams interact and accomplish mutual information processing and meaning production – despite the visual asymmetry, or perhaps thanks to it. The concluding section gives a summary of the main findings and discusses the significance of the interactive approach to translation process research and to translation studies more generally.

Making meaning together: the relevance of socially shared cognition to translating

Translating is cognitive processing *par excellence*. It requires the analysis of the communicative situation (e.g. the requirements and aspirations of the commissioner and end-users) and the use of the senses to perceive some source material (e.g. a film to be subtitled or a text to be translated). The perceptions are interpreted into conceptualisations relevant enough to be transferred to target material, whereby relevance is defined both locally (analysis of the materials at hand) and globally (analysis of the situation). In this sub-process, translating requires problem-solving and decision-making, as there are multiple options to interpret and portray communicative material. When these central operations of translating extend beyond the brain to the environment, where they have their natural embedding (e.g. Cooke et al. 2013; Tomasello 1999), cognitive processing becomes available for observation: we can testify (e.g. perceive, record on video and screen capture, or transcribe) how translators use tools (computer, internet, etc.) to solve problems, and how they resort to human–human or human–computer interaction.

Having acknowledged the centrality of cognitive operations for/in translating, let us contemplate the concept of cognition in more general terms. Cognition refers to the

human intellect and thinking (Molder and Potter 2005, 6). Cognitive science seeks to explore and understand the human mind (Frankish and Ramsey 2012, 1) and its multifaceted functions, such as perception, attention, memory, learning, problem-solving, affect, and creativity (see also Risku and Rogl 2021). Like any discipline, cognitive science entails different – competing or parallel – paradigms. Today’s cognitive science is moving both inwards and outwards in relation to the individual brain: to neurobiological discoveries on the one hand and to embeddings and extensions in the world on the other (Frankish and Ramsey 2012, 3). Thus, cognition concerns not only mental representations but also the mind’s and body’s action in and interaction with the world (Newen, de Bruin, and Gallagher 2018b). According to the *extended cognition* paradigm, which is applied in translation studies as the *extended translation* paradigm (see Sannholm 2021, 19), cognition includes several partly overlapping dimensions (Muñoz-Martín 2017, 563–564; see also Newen, de Bruin, and Gallagher 2018a; Risku and Rogl 2021):

- *embodied* cognition (the body influences and even determines thought processes),
- *embedded* cognition (the environment influences thought processes),
- *enacted* cognition (thinking is partly constituted by action),
- *extended* cognition (the environment is used as part of mental processes),
- *affective* cognition (emotions are part of thought processes),
- *distributed cognition* (cognitive processing is performed jointly by several agents).

Distributed cognition can be further specified via two different concepts:

- *shared cognition* (individual cognitions are being shared in interaction, Resnick, Levine, and Teasley 1991),
- (*interactive*) *team cognition* (cognition is a team property, Cooke et al. 2013).

These views can also be seen as complementary dimensions of human intelligence (Risku and Rogl 2021, 480–481). Thinking is distributed, action and interaction are part of individual thinking, and the social and material worlds contribute to – or scaffold – cognitive abilities such as memory and problem-solving. Distribution means that individual representations are externalized to be communicated to and manipulated by other agents in the system (Korhonen and Hirvonen 2021; Nurminen 2020). Thus, cognition resides both *in* and *between* individuals, and cognition can be located on various levels of human action: in the mind, in a social group, and in a culture (see Cole 1991, 399).

The concept of *socially shared cognition* maintains that cognition extends beyond the individual because people, simply by being and acting together, influence one another’s thinking processes, for instance by providing information, asking questions, and elaborating on each other’s ideas (Resnick 1991, 2). In short, shared cognition means “the ways in which people jointly construct knowledge under particular conditions of social purpose and interaction” (2). Some research goes as far as to claim that, in certain types of shared activity, cognition becomes a team property, untraceable to any sole individual (Cooke et al. 2013, 256); this is *interactive team cognition*.

A common denominator for shared and interactive team cognition is the argument that cognitive processing *is* interaction, i.e. it is a reciprocal, simultaneous co-action

between people in which each individual action potentially affects the other participants and actions and in which participants accomplish joint projects. Cognition is “an activity that is realized when the physical system (e.g. a nervous system) comes into active contact with the information in its environment” (Cooke et al. 2013, 266). Social interaction between humans is thus pivotal to shared cognition. Social interaction materializes through multimodal communication resources, which are different semiotic modes such as talk, gestures, posture, and gaze, and the simultaneous use of these modes. In interaction, people display their individual cognitive processes to each other by, for instance, verbally reporting their views, or they embody their cognitive processing through various verbal and bodily means (Heritage 2005), such as focusing joint attention on something by pointing or visualizing their thinking through gestures (see Martín de León and Santana 2021 for a recent publication on embodied cognition in simultaneous interpreting). On the other hand, practices of sociality and the “orderliness” of interaction constrain and structure shared cognition (Resnick 1991, 9–10; Schegloff 1991, 152–153). For instance, people in interaction adhere to preserving both their own “face” and others’, which leads to particular interactional “rules”, such that a disagreement is usually dispreferred and therefore requires more interactive work than an agreement (Pomerantz and Heritage 2012). Thus, disagreeing with others may slow down the problem-solving in a collaborative translation process. This is vital in determining the *socio-cognitive* modeling of translation: both social and cognitive factors of being human contribute to collaborative translation processes.

Materials and methods

As the MUTABLE project was established to study the process of making of audio descriptions as it occurs in real life (MUTABLE n.d.), the methodology selected is a combination of microethnography (e.g. Streeck and Mehus 2005) and multimodal conversation analysis (e.g. ten Have 2007; for its application to team translation, see Hirvonen and Tiittula 2018). Microethnography is the study of human practices with a qualitative, often exploratory approach. As a branch of ethnography, it is interested in mapping unknown territories of human life but, in contrast to mainstream ethnography, microethnography uses recordings of practices (often, videos) instead of field notes and observation, to make its analyses verifiable by a repeated viewing of the interaction or actions of the people under study (see Risku et al. 2022). Multimodal conversation analysis also deploys authentic video recordings to the analysis of the structure, practices and resources used by people in interaction. In the present study, I use these methodologies to describe what kind of cognitive processing takes place behind a “textual make-up” of a translation product (cf. Toury 1995; 2012), and to track the translating step by step as it occurs per identified problem (cf. Jiménez-Crespo 2017).

Following the methodology and the research objectives, we¹ observed and recorded naturally occurring team translation processes and collected a corpus of video recordings in Austria, Finland, and Germany in 2016–2017. Altogether, the MUTABLE corpus entails approximately 40 h of video, comprising eight authentic translation commissions, five different teams and 14 different translators or editors as well as one professional speaker. The corpus consists of recordings of AD team meetings in two types of collaborative work practice: teams of blind and sighted participants are used either in the

translation task (i.e. producing an AD script from scratch; illustrated in Example 1) or only in the stage of editing (a previously prepared AD draft is being tested and revised; see Examples 2 and 3). Most of the data are from the editing task, which constitutes a more common collaboration practice than the translation task. For the purposes of data analysis, the video data were transcribed and the transcripts organized in the analysis software Atlas.ti. The videos were observed repeatedly and the transcripts labeled with codes to distill recurrent practices (such as phases and processes of translating) that become subjects of analysis.² The analysis found a systematics of shared cognitive processing across the teams' interactions, and this is demonstrated next with the microanalysis of the key phases of translating.

Analysis and findings

From the data analysis, three key phases of translating have been selected to illustrate shared cognition in the translation process. The translation process here refers to the level of "translation act" (the "gradual coming into being", originally defined as an individual process by Toury [1995, 187]), and to the interpretative approach to translation (the process of understanding, de-verbalizing, and re-formulating, Lederer 2010). The examples feature three situations, each of which represents work in a different AD team, focuses on the AD of different source texts, and presents one constitutive phase of the translation act:

1. source text (ST) perception and interpretation,
2. source text interpretation and analysis,
3. target text (TT) production.

Next, I analyze the examples following the conversation analysis method. For each example, I first contextualize the current interactive situation (a description of the task or activity, the participants and their roles is given), then reconstruct the interaction and action in the selected situation step by step and, finally, enrich the descriptive analysis of the situation by interpreting the interaction and action in theoretical terms. The excerpts are reproductions of video data, consisting of black-and-white drawings that represent the visual-interactive constellation of teamwork and of transcriptions that represent the audible action (e.g. speech and film sound). The transcription conventions used are described in the appendix. In the examples, the original Finnish and German utterances have been translated into English preserving the source language's word order as much as possible, which might render some translations somewhat odd.

Shared cognition in perceiving the source material

The first situation illustrates shared cognition as the joint construction of perception and interpretation of the source material. A team consisting of two sighted and one blind audio describers is drafting an AD script for a German TV film (genre: drama). Ines³ (a sighted participant; sitting on the left in Image 1) is responsible for navigating the source film on one laptop, while her colleague Lisa (another sighted participant, in the middle) types the script on another laptop. Their blind colleague Sara (on the right), monitors

the work and participates in the drafting with comments, proposals, and requests. Prior to the drafting stage, the team watched the source film together, and they are now working on it scene by scene.

In the activity of drafting, the team is first perceiving a scene in the source film. They then stop the film and start to formulate a description of a particular element in it. In parallel with the formulation work, the team is also spotting, or cueing (Jankowska 2021), the script, that is, fitting the description into the dialogue-free gaps in the film. As we step into the team's translation work, Lisa is describing an action in the scene she is perceiving (lines 251–253 in Example 1), which is the focus of the detailed analysis below.

Example 1. CFAD1 / MVI_0114 / 00:12:10–00:12:34.



Image 1.1

251 LI: also sie läuft jetzt auf diesen mann zu,

#Image1.1

so she is walking now towards this man

252 SA: =mhm,

253 LI: der vor dieser stele sitzt;

who in front of this shaft is sitting

Lisa's description is an account (Heritage 2005, 186), a cognitive display which she carries out multimodally, using both bodily and verbal resources to display her current focus of attention (the hand gesture and gaze showing towards the film image, Image 1, and the verbalization “so she is walking now towards this man”). The blind participant, Sara, acknowledges Lisa's account with verbal feedback (*mhm* in line 252). Lisa then adds a detail to her description:

254 (.) noch immer, (0.3) der trägt ein stirnband

still he is wearing a headband

255 £(und oben) guckt wie so eine ei

#Image1.2

and above peaks kind of like an egg

256 [seine glatze raus;]

#Image1.3

his bald out

257 IN: [°fhehehef°] ((laughs silently))

258 LI: .hhf [ähm:]

259 SA: [fHIHf] ((laughs silently))

#Image1.4



Image 1.2



Image 1.3



Image 1.4

As Lisa describes a character's appearance ("he's wearing a headband and above his head peaks out like an egg", lines 254–256), she produces a laugh. It is a vocal display of a change of state; her affect has changed from serious to being amused. She also makes an illustrative gesture of "peeking out like an egg" (Image 1.2). Shortly after Lisa starts laughing, Ines joins in (line 257, Image 1.3). Sara, at first, remains serious

and concentrated. However, after a second, she also joins in by producing a loud laughing particle, *HIH* (line 259), and gazes towards her colleagues (Image 1.4). The team then moves on to describing other elements of the scene.

The joint activity of ST perception (the conscious sensory experience, Goldberg 2010, 8) requires “free formulation” from the sighted participant(s) to give the blind participant information and context to understand the film and to provide a base for the verbal formulation of it, i.e. the final description to be inserted into the AD script. Free formulation is typical in the translation task of team AD since, as the team is drafting descriptions from scratch and perceiving the source material together, an account of what is visible is given before formulating the description. Free formulations are relevant not only for the blind participant but also for the other sighted participant currently not verbalizing the content but visually perceiving it, to propose candidate descriptions and to serve as a common ground for the team to start drafting the TT and the final formulations (descriptions) (see Hirvonen and Tiittula 2018, 164).

This example of an embodied display of attention and a shared affect shows how perception, which leads to recognition and action (Goldberg 2010, 8–9; here: to text interpretation), can be an interactive accomplishment, that is, intersubjectively and mutually shared. In addition, the example demonstrates several dimensions of cognition at work: the thinking is enacted (constituted by bodily action), extended (the blind person uses her sighted colleagues’ actions in her own mental processing), affective (perception produces an emotional effect), and shared (the effect is acknowledged and affiliated to by all participants and the visual attention is co-constructed by the sighted participants). We cannot observe from the data what the mental imageries of the three participants are at this point (whether they have the same referent, “a funny-looking guy”, in mind). However, we can observe the jointly produced laughing sequence, which displays all the participants’ affiliation to a certain affect (Lindström and Sorjonen 2012), and thereby it is an intersubjectively shared understanding of the humorous scene. Solidarity is a powerful orientation of humans, and it conditions interaction in the sense that disagreement and conflicting interpretations about the task at hand are typically mitigated (see Lindström and Sorjonen 2012, 350, 368).

Agreement is foundational for the functioning of translating teams as they aim for a joint interpretation of the ST to serve as the grounding for the TT. However, equally central in the context of team translation and shared, interactive cognition is the integration of diverse perspectives (see Cooke et al. 2013, 256), which may also involve conflicting interpretations of material or understandings of the task at hand. The next excerpt presents a sequence of disagreement to demonstrate how individual perspectives and perceptions must sometimes be negotiated to construct shared cognition as a joint understanding of the source material and how cognitive processing is distributed in team AD.

Shared cognition in analyzing the source material

Example 2 shows how participants share the cognitive labor involved in interpreting source material and how their different perceptual orientations, experiences, and expertise benefit the translation process in terms of higher accuracy. The analyzed situation illustrates particularly well the blind participant’s expertise in using auditory information (the soundtrack) as a meaning-making resource in team AD.

In contrast to the translating task (drafting an AD script from scratch) in the previous example, Example 2 presents another type of collaboration in which a team consisting of one blind participant and one sighted participant revises and edits a draft AD script. In these cases, prevalent both in the German and Finnish-speaking AD industry, the first draft is produced by the sighted participant individually before the team meeting. The blind participant may or may not have previewed the source material beforehand.

The team in question is working on an AD of a Finnish documentary film. Päivi, the blind participant (on the right of Image 2.1) and Terhi, the sighted participant (on the left) had a work practice that involved two phases: First, they tested the AD script by having the sighted member perform it with the source film. Then, after having gone through the whole film, they discussed it based on the notes the blind participant had typed during the viewing. In contrast to the German-speaking teams in the data, the Finnish team did not always solve translation problems during their joint sessions, but rather some issues were merely noted down by the sighted participant so that she could deal with them later in her individual writing work.

In the analyzed excerpt, we first follow the team in the testing phase, in which a problematic description is identified, and then describe and analyze the subsequent meetings in which the problem is discussed and solved. The participants sit side-by-side at a table facing a laptop and loudspeakers (Image 2.1). Terhi is reading her draft AD from a tablet computer in her hands and voices it onto the film soundtrack, while also paying attention to the film image. Päivi is listening, staring ahead, and has her hands ready to type notes on a Braille keyboard on her lap. The detailed analysis here begins as a longish passage of a honking and screaming of birds is heard on the film (Example 2). This is followed by Terhi's description, "a flock of birds is flying in the blue of the sky" (line 23) and a long shot of birds in the sky (Image 2.1.1).

Example 2. CFAD2 / S1330004 / 00:01:26–00:01:54.



Image 2.1

22 FS: [((birds honking))]

23 TE: [lintuparvi lentää taivaan sinessä,]

#Image2.1

a flock of birds is flying in the blue of the sky

24 FS: ((birds honking, musical tones, 5.0))



Image 2.1.1 © DoubleBack Documentaries

Päivi is in a posture of “concentrated listening” (Hirvonen and Schmitt 2018, 458), sitting almost immobile – only her eyes flicker. As Terhi briefly utters “gulls” (lines 25–26), the team’s behavior changes: While identifying the birds as “gulls”, Terhi turns her body orientation slightly toward Päivi (Image 2.2).⁴

25 FS: [(birds honking, musical tones))
 26 TE: [lokkeja; (.) laurin silmä. (1.5)
 #Image2.2 #Image2.3
 gulls Lauri’s eye
 27 silmä [liikkuu.]
 #Image2.4
 the eye moves
 28 [(swishing sound, 1.0))]



Image 2.2



Image 2.3



Image 2.4

Päivi’s eyes open wider and stare ahead, and she moves her fingers on the keyboard to type a note (Images 2.2–2.4). A swishing sound is audible during this action (line 28), likely caused by Päivi moving the keyboard on her lap. Terhi frowns as the swishing

sound is heard (Image 2.4). Although Päivi typically does not comment on the AD during the testing phase, she now corrects Terhi on the spot:

29 FS: ((birds honking, musical tones, 2.0))

30 PÄ: ((whispers)) n'on kyllä hanhia; £hmh£

#Image2.5

they sure are geese

31 TE: =£haf

32 PÄ: ainaki se ääni.

at least that sound

33 (1.0)



Image 2.5

34 TE: *nods*

35 TE: ((whispers)) ä-öm hei kiitos. (0.5)

um hey thanks

36 ne näytti kyl' lokeilta; (.)

they sure looked like gulls

37 no mut täytyy tsekata.

oh wel (that) must be checked

38 PÄ: =voi olla.

[it] can be

Päivi whispers “they sure are geese” (line 30), displaying her disagreement with Terhi’s interpretation of the film sound. Päivi finishes her turn with a smiling interjection, £hmh£ (line 30, Image 2.5), thereby mitigating her disaffiliation through non-intrusive vocal resources (whispering and smiling). Terhi matches Päivi’s state by responding with a wide smile and an interjection £haf (line 31). Päivi continues with an elliptical utterance, “at least that sound” (line 32), justifying her argument; she discerns the species of the birds by the sound they make. Terhi displays her agreement both verbally and with a nod (lines 34–35), and then justifies her word choice through visual perception: “they sure looked like gulls” (line 36). Although Terhi promptly acknowledges that the problem must be solved (line 37), the team does not resolve it then and there but continues with the testing.

After the testing phase, Terhi and Päivi have a feedback discussion. Sixteen minutes into their discussion, Päivi brings up the translation problem: “then there were those gulls (-) slash geese” (CFAD2_S1330006: line 647).⁵ This is followed by a discussion of a possible audiovisual discrepancy the image may show something different than what the sound indicates. The team concludes that they will choose a solution based on visuality (the reference to “gulls” is preserved), although Päivi displays dissatisfaction with the solution. Nonetheless, the solution is only tentative, since by the second revision meeting,

the description has been changed from “gulls” to “geese”. Terhi highlights the change during the AD testing by emphasizing the word “geese” in her description: “geese are flying in the blue of the sky” (CFAD2_S1340005: line 35). She also pauses the film and verbally confirms Päivi’s interpretation (“they were geese”, line 37), adding that she had not seen it (properly) earlier.

Example 2 demonstrates the sharing of individual cognitions (here: sensory perceptions and their interpretations) to construct a shared understanding, which is to become a joint translation product. The sighted participant has sensory access to the film image and sound as well as the AD script, whereas the blind participant scaffolds her thinking via the film audio and her colleague’s verbalizations. In addition, both have access to each other’s behavior as potential scaffolds. Terhi’s tone of voice can help Päivi to interpret the level of certainty in Terhi’s assertions, while Päivi’s visual and audible actions (taking notes, for example, since Terhi knows Päivi notes down potential problems) can be perceived by Terhi as embodied displays of a change of state. Furthermore, multimodal information from the audiovisual source material allows multiple perspectives to the information at hand, which is a constitutive part of team cognition (Cooke et al. 2013, 256). Thanks to the multimodal, verbal, and nonverbal exchanges of individual interpretations and the debate about their epistemic status, the team arrives at a solution that is acceptable to both parties. In fact, it can even be claimed that the sharing of cognition here means “the same referent in mind” (see Cole 1991) – the concept of “gull” – in the blind and the sighted participant. Thanks to the audio-visual representation of it in the film, it can be verified (i.e. recognized) by both.

The third and final example deals with a similar team and task constellation as in Example 2 (one blind and one sighted participant editing and revising an AD draft). However, it differs from the previous one in two important ways: the interactive and multimodal problem-solving occurs in the joint meeting, and, beyond the individual and intersubjective reasoning, the cultural-collective level of cognition is also deployed as a scaffold to arrive at a joint translation solution.

Shared cognition in formulating the target text

In Example 3, the team of one blind and one sighted participant is solving a terminological problem in the AD draft they are testing. The AD is being created for a German-speaking lifestyle reality program. The team proceeds scene by scene, which allows the team to review the descriptions and the events in the TV program on the spot and to use the ongoing audiovisual narration as a scaffold. The participants are seated side-by-side at a table facing a laptop, an external screen and loudspeakers. The sighted participant (Alex, on the right of the first drawing in Image 11) controls the program and the AD script on the laptop. The blind participant (Lars, with the sunglasses) listens but is not taking notes. This team makes abundant use of external resources, such as internet databases, in their editing process to find and check candidate solutions. They also implement changes to the AD script on the spot.

In the situation represented below (Example 3), Alex has just described a scene in the program in which the main character sets a flower arrangement on a dining table. The program has been paused, and the floor is open for Lars to make remarks about the AD.

Example 3. CFAD7 / S1450005 / 00:15:44–00:16:03 and 00:17:06–00:17:44.

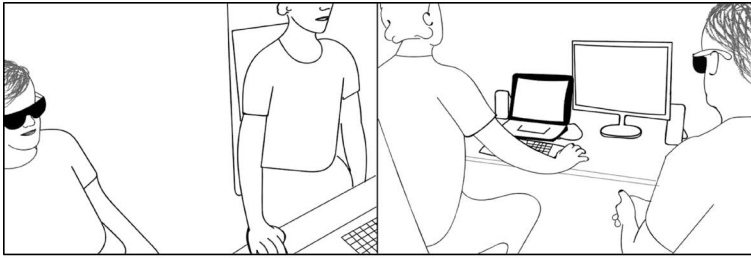


Image 3.1

- 37 (2.0)
- 38 LA .hh j:a, das grünzeug am anfangꝫ (.)
#Image3.1
yes those greens in the beginning
- 39 wo drum herum platziert sie das;
around what does she place them
- 40 (1.0)
- 41 AL ↑achso, um das blumengesteck;
oh around the flower arrangement
- 42 (0.5)
- 43 AL also zuerst, (.)
so first
- 44 (>also<) quasi sie ergänzt das=die eigentlichen blumenꝫ
so she like complements the the actual flowers
- 45 [noch um,]
still with
- 46 LA [können wir] (da nochmal) hin:[:]hören;
can we listen to it again
- 47 AL: [mhm.]
- 48 ja.
yes

Lars introduces a topic for discussion through an elliptical phrase (“those greens in the beginning”, line 38) that contextualizes his subsequent question (“what does she place them around”, line 39). The utterance allows an interpretation that Lars’s current problem is his difficulty in understanding the AD: he needs more information about the “greens”. Alex responds to Lars’s request by giving him the information (“around the flower arrangement”, line 41). As Lars does not take the speaking turn, Alex continues by elaborating with a free formulation (lines 43–45). His verbal and nonverbal behavior displays uncertainty or difficulty: he pauses, makes several self-repairs (*also quasi* and *das = die*), and expresses indefiniteness (*quasi*). The problem is not solved, however, and Lars proposes revising the scene again (line 46).⁶ The next actions, which I have omitted to save space, are the team’s revision of the scene with AD and

the discussion of possible text-structural solutions for building a clear cohesive tie between “greens” and “flower arrangement”. This ends with Lars accepting Alex’s proposal to restructure the text so that the descriptions are closer to each other and the schematic link between them becomes clear.

We now jump to a sequence in their conversation in which the team arrives at a mutual understanding about the ST and solves the formulation problem in the TT.

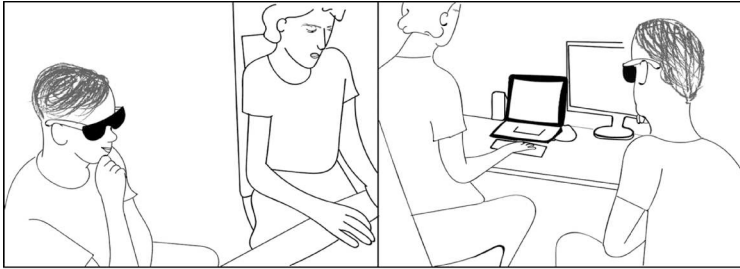


Image 3.2

75 ((3.0, two mouse clicks))

76 LA mhmζ

77 AL ((reading out loud while typing)) ein rotweißes blumengesteck; (.)

a red-and-white flower arrangement

78 margarete: (.) platziert, (1.5)

#Image3.2

Margarete places

79 grün- (.) >kann man grünzeug?< ist das sehr lapidarζ

green- can we greens is it too terse

80 ist das sehr umgangssprachlich oder;

#Image3.3

is it too colloquial or

81 LA °>kann man es<° (0.5) erkennen was das ist?

is it possible to recognise what it is

82 (1.5, Alex taps on keyboard)

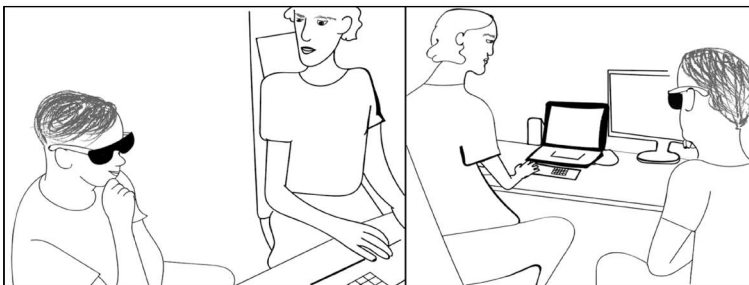


Image 3.3

Alex reads his formulations out loud as he types them in the AD script (lines 77–78). Lars is in a “thinking posture”, with which he displays engagement in the formulation activity bodily with his head and face turned slightly to Alex (Image 3.2) and verbally

Lars gives a candidate solution to the problem and suggests classifying the plant as “ivy” (line 83). Yet he marks his answer verbally and prosodically as uncertain and yields the turn to Alex for confirmation. Alex re-plays the film (line 84) and uses the laptop to confirm the term through an internet search (Image 3.4). He also displays surprise and amusement at the fact that Lars, without being able to perceive the image, seems to know exactly what it depicts. Lars answers by stating a fact from his personal history that explains his knowledge of plants (line 89).⁸ After Alex has confirmed that the term matches with the image (lines 92–95), they both burst into laughter (lines 96–97) and Alex adds the solution directly into the AD script.

In this case, the blind participant has effectively scaffolded his cognitive processing through contextual and conceptual cues, that is, by linking *information* gained from the interaction with his colleague and from the program (flower arrangement, greens, foliage plant) with his world *knowledge* gained through experience (being a biologist’s son) to deduce the object in question (ivy). The team members here complement each other’s cognitive processing (perception, attention, categorization) in the sense of interactive team cognition (Cooke et al. 2013): Alex sees the plant but does not know it (i.e. have a concept readily accessible in mind), Lars knows the plant and has access to the concept although he does not see it, and both participants and their interaction are needed to solve the problem. Furthermore, the team members extend the cognitive processing beyond the individual and intersubjective to the collective dimension (Resnick 1991, 7): visual information perceived by Alex’s and Lars’s conceptual knowledge is verified by Alex’s use of tools as he confirms Lars’s personal knowledge against the collective knowledge on the internet (here: the search engine results and the Wikipedia page of the plant in question).

Discussion

In this article, the multimodal conversation analysis of team AD was applied to the study of cognition in translation processes, with the main argument that cognition can be a team property residing in the exchange of information and knowledge as well as in the integration of perspectives in joint meaning-making between cognitive agents. The examples presented involve various types of cognitive processing (perception, attention, conceptualization, problem-solving and decision-making) and manifest the simultaneous workings of several dimensions and levels of cognition: the embodied, enacted, extended, affective, distributed and shared aspects of cognition, as well as the individual, intersubjective and collective levels of cognition. The analysis also exemplified how versatile communicative modes and multimodality are used as resources for cognitive displays in team translation. In teams that work face to face, such as the ones studied here, cognition is a process (Cooke et al. [2013], 266; Molder and Potter [2005], 6) which is shared and distributed “across several individuals whose interactions determine decisions, judgments, and problem solutions” (Resnick 1991, 3).

The analysis showed how translating as a particular kind of situated activity, involving two different perspectives or systems (Risku, Windhager, and Apfelthaler 2013, 153), comes about step-by-step, and the study redefined the concept of translation act as an interactive phenomenon (Chesterman 2015; Lederer 2010; Toury 1995; 2012). This act can be defined as the processing of information and the production of meaning, which encompasses several types of cognitive processing:

- 1) *Information processing*: The source material, as well as the team members' verbal formulations and embodied actions, are perceived and interpreted. As different participants pay attention to or have access to different aspects of the source material, they mutually complement each other's information processing.
- 2) *Meaning production*: The material that is being perceived and interpreted is fine-tuned to become a shared meaning that connects the locally relevant communicative instance (information) with a generalizable, collective understanding (knowledge) in the target material (see Liew 2007; for the local production of meaning in social interaction, see Bilmes 2011; Deppermann 2011). In AD, percepts and relevant information are given (linguistic) meaning by categorizing and relating them to conceptual structures.

This article approached the translation process from the viewpoint of shared (and interactive) cognition and analyzed empirical, real-world process data from teamwork in AD. Albeit presenting a modest amount of data, this study is among the first to analyze the microlevel of interactive cognitive processing in translation. While the examples in this article are representative of the case they illustrate (team AD) and the findings indicative of translating in general, more research is needed to study other areas of translating and interpreting: to discover and compare shared cognition and the interactive co-constructing of meaning across settings of social interaction. What systematic strategies for problem-solving and interactive meaning-making are there in different team translation settings? How do rules, structures and interaction practices regulate the translation process and the sharing of cognition(s)? Indeed, the interactive approach to translation processes is not interesting merely from the viewpoint of cognition, but it can also reveal how norms, identities, statuses, and other phenomena of sociological interest are negotiated and become intertwined with cognitive processing in translation. Negotiating cognitive displays in interaction reveals potentially contesting positionings about “who knows best” (see Heritage 2005, 200), and social interaction makes observable the practical application of social, higher-level rules, such as translating norms, in the sense of intersubjective understanding of those rules (see Toury 1995, 54).

Complementing research on socio-cognitive translation studies, I have focused here on the lesser-studied layer of translation processes: the reciprocal, co-occurring interaction between translating agents. In this perspective, cognition is *shared* in two senses of the word (Cole 1991, 398). First, cognitive work is being distributed, that is, divided between participants and different cognitive resources (e.g. the participants' sensory and knowledge perspectives and use of tools in the task). Second, sharing refers to the team's ability to develop a common experience or state. Despite the asymmetrical access to the material to be translated (sensory or conceptual), “shared objects and displays facilitate the process of referential anchoring – making sure that speakers and listeners understand a word or phrase in the same way” (Resnick 1991, 10). Even if one does not wish to make such a strong claim about the “sameness” of (mental) representation that the participants would share, the appeal of the interactional approach to cognition is that such an argument is not even necessary. It is sufficient to show how participants treat and scaffold each other's cognitive processing and negotiate meanings to co-construct a *tolerable shared representation* of the source item, which all participants have access to.⁹ Instead of concentrating on the “black box” of the human mind to define

meaning-making, the shared cognition approach invites us to search for it in social interaction (cf. Martín and Rojo López 2018, 61). Having the same referent/object/understanding in mind, albeit via different sensory or conceptual access, is a vital finding in AD and might be so also for translation in general. This sharedness as “having in common” appeals to the very essence of translating, which has been defined as equivalence (Nida 1964), similarity (Chesterman 1996), or invariance (Moscrop 2016), but which is also challenged by linguistic relativity (Jakobsen and Alves 2021, 3). Thus, instead of assuming “a reachable common humanity that makes it possible for us to have similar, explicable and translatable thoughts and experiences” (Jakobsen and Alves 2021, 6), what counts in socio-cognitive translation studies is human sociality, which is the orientation of human beings towards communication and mutual understanding to collaborate with others (e.g. Tomasello 1999). Following this line of thought, the focus of sharedness, or similarity, is not that much on one “truth” (of the individual minds, see Jakobsen and Alves [2021, 4]) but on several co-existing perspectives and the integration of these in an externalized (i.e. observable) negotiation to become an intersubjectively valid reality and a tolerable shared representation – a translation.

Notes

1. The data production was supported by the work of the MUTABLE research assistants, one of whom pointed me to analyze a sequence in the data that thus became Example 3 of this article.
2. For an overview of the AD process data and methodology, see Hirvonen, Hakola, and Klade (2023).
3. The persons in the data are named by pseudonyms.
4. The verbalization *lokkeja* (“gulls”) that Terhi uses to specify the object was not scripted in the AD draft, so Terhi could have decided spontaneously to name the birds as such.
5. The transcript is not included due to space restrictions.
6. Note that the blind describer uses the expression *hinhören* (“listen (in)to/more carefully”), which points again to the importance of auditory perception in making sense of the film.
7. Alex already displayed discontent with this particular description in the interaction earlier, but this is outside the transcription.
8. The real occupation has been concealed for the sake of privacy.
9. The idea of tolerability stems from the linguist Nick J. Enfield (2015, 150) who defines (word) meanings as “tolerable friends”: “the word’s communicative effect is compatible with more than one version of its meaning”. This conceptualization converges with the concept of similarity in translation by Chesterman (1996).

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