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Breakdowns and assemblages: Including machine-actants in sociolinguistic ethnographies of blue-collar work environments

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Abstract

A central concern in sociolinguistic ethnographies has been how people use language to make social distinctions. This article discusses the relevance of paying closer attention to the role of machines as actants in communication and social distinction-making processes. It analyses audio and video-recorded workplace interactions between humans and machines in a metal foundry in the Dutch-German borderland. Specifically, it focuses on several cases of a breakdown of a production process, a frequently observed phenomenon in the foundry. The cases show that: (1) the production work entails many improvised human–human and human–machine interactions as opposed to Taylorised working practices; (2) the machine-actants initiate and afford (re)negotiations of situated, hierarchical workplace relations through these interactions; and (3) the question whether these interactions should be considered 'language-centred' or 'language-marginal' partly depends on an ideological, conceptual distinction between what counts as 'language' and what not.

KEYWORDS

assemblage, blue-collar workplace, ethnography, human–machine interaction, posthumanism, workplace communication

Abstract

Ein zentrales Anliegen der soziolinguistischen Ethnographie ist die Frage, wie Menschen Sprache verwenden, um soziale Differenzierungen vorzunehmen. In diesem Artikel wird erörtert, inwieweit es sinnvoll ist, die Rolle von Maschinen als Aktanten in Kommunikations- und sozialen Differenzierungsprozessen genauer zu betrachten. Es werden Audio- und Videoaufzeichnungen von Interaktionen zwischen Menschen und Maschinen am Arbeitsplatz in einer Metallgießerei im deutsch-niederländischen Grenzgebiet analysiert. Dabei liegt der Fokus insbesondere auf mehreren Fällen eines Produktionsausfalls, einem in der Gießerei häufig beobachteten Phänomen. Die Fälle zeigen, dass: (1) die Produktionsarbeit im Gegensatz zu taylorisierten Arbeitsverfahren viele improvisierte Mensch-Mensch- und Mensch-Maschine-Interaktionen mit sich bringt; (2) die maschinellen Aktanten durch diese Interaktionen (Neu-)Verhandlungen von situativen, hierarchischen Arbeitsplatzbeziehungen initiieren und ermöglichen; und (3) die Frage, ob diese Interaktionen als "sprachzentriert" oder "sprachlich marginal" zu betrachten sind, teilweise von einer ideologischen, konzeptionellen Unterscheidung abhängt, was als "Sprache" gilt und was nicht.

1 | INTRODUCTION

Different work tasks activate different types of language skills, such as reading, writing and communicating in one or several language varieties (Boutet, 2012, p. 208). In some fields of work, such as marketing, translation and customer services, these skills are required for key aspects of the work process and/or the final work product (Heller, 2010). 'Blue-collar' fields of work, such as agriculture, manufacturing and cleaning services, on the other hand, are typically considered 'language-marginal' or 'language-minimal' (McAll, 2003). In these settings, verbal interactions between human beings become prominent mostly when routinised work practices are disrupted (Kleifgen, 2013).

This article focuses on several disruptions, or breakdowns, of a production process in a contemporary metal foundry. It discusses the question how these breakdowns emerge, and how they are interactionally managed. The primary aim of the article is to show the relevance of including machines as agents, or *actants* (Latour, 2005), in sociolinguistic ethnographies. The analysed data underline the agentive role of machines, as initiators and *affordances* (Gibson, 2015), during the emergence and management of breakdowns. Moreover, the data show that the social relations between the various human and non-human participants are not just negotiated through human–human interactions, but also through human–machine interactions. Finally, they provoke the question why only particular workplace

interactions are called 'language' (see also Pennycook, 2021, pp. 231–232), and whether this may serve to legitimise social inequalities between different groups of workers (see also Cornips & Van den Hengel, 2021; Kusters & Lucas, 2022).

The metal foundry is located in the Dutch province of Limburg, a regional minority language area in the Dutch-German borderland. In many ways, Limburg resembles other minority language areas in high-income economies, which are characterised by a loss of sources of income such as mining and manufacturing, and an increasing reliance on alternative sources of income such as tourism (see Heller et al., 2014). The metal foundry is an exception to this, as it has managed to survive thus far. The foundry's use of temporary workers, who often speak other language varieties than Dutch and the regional minority language Limburgish (such as German and Polish), may partly explain this. Other explanations may be *Taylorism*, that is, 'the management practice of segmenting labor into standardized, repeatable tasks in order to maximize efficient production' (Urciuoli & LaDousa, 2013, p. 177), and *mechanisation*, that is, the delegation of human work tasks to machines.

Interestingly, routine disruptions or breakdowns happened practically every day and night during my fieldwork in the foundry, exactly because of its heavy reliance on both machines and temporary labour with diverse backgrounds and high turnover rates. Unexperienced workers were typically able to perform only peripheral aspects of a given practice (Lave & Wenger, 1991), and this very practice sometimes even still had to emerge (King, 2014), for example because it involved a machine that a worker was not yet familiar with, or that was behaving in an unexpected way (see also Hovens, 2020). The analysed breakdowns from this article thus illustrate that the foundry was not necessarily 'language-marginal' or 'language-minimal', even when *language* is defined narrowly. Furthermore, in case *language* is understood more broadly, the foundry arguably stands out as similarly 'language-centred' as most other workplaces.

Language, in a broad sense, can be considered a vital force that makes temporary associations of diverse actants possible (see also Pietikäinen, 2021, p. 4). For the management of breakdowns, this force is crucial. The concept I use to describe these processes in this article is *assemblages* (Bennett, 2010; Deleuze & Guattari, 1980; Latour, 2005), which have been defined as 'ad hoc groupings of diverse elements' whose 'ability to make something happen' is 'distinct from the sum of the vital force of each materiality considered alone' (Bennett, 2010, pp. 23–24). A human–machine assemblage, for example, can make things happen that neither the human nor the machine can do alone. If either the human or the machine breaks down, the production process will be interrupted. In this respect, on a smaller scale, the human and the machine can each be considered assemblages in and of themselves as well (Bennett, 2010, p. 31), as particular parts of a human body may get tired or injured, and as particular parts of a machine may stop working. Similarly, on a larger scale, the human–machine assemblage can be considered part of a broader political-economic assemblage (such as capitalism) or commodity chain (Latour, 2005, p. 178; Thurlow, 2020). In fact, as the COVID-19 crisis has underlined, blue-collar workers constitute a vital part of such larger-scale assemblages, as their work is often deemed 'crucial' for the economy and society.

In brief, this article analyses different breakdowns of a production process in a metal foundry, while highlighting the role of human–machine interactions during the emergence and management of these breakdowns, the social relations that are (re)negotiated through these interactions, and their arguable 'language-centredness'. In the next section, I discuss the previous blue-collar workplace studies that this research builds upon. Afterwards, I introduce the background of the metal foundry, the fieldwork I have executed there, and the data I have gathered in this way. I then present the analysis of the breakdowns in detail, which is followed by a final discussion section with lingering thoughts.

2 | LANGUAGE IN BLUE-COLLAR WORK ENVIRONMENTS

This article is situated in a field of sociolinguistic-ethnographic studies of blue-collar work environments. I am aware that the etic term 'blue-collar' as a general name for this field has been problematised, partly because it comes with connotations of being 'unskilled', an ideology that can serve to legitimise workers' exploitation (Gonçalves & Kelly-Holmes, 2021, p. 2). Still, many researchers, including the critics mentioned, use the term by lack of an alternative that solves such problems, while simultaneously capturing the broad category of workers 'whose job is often, but not always, temporary, and low-status' (Lønsmann & Kraft, 2017, p. 138), as well as physically demanding. Another common observation is that blue-collar workers are often minoritised speakers, as there are typically not enough majoritised speakers who are willing to do blue-collar work (see, e.g., Holm et al., 2020; Kraft, 2019; Piller & Lising, 2014).

Overall, sociolinguistic-ethnographic studies of blue-collar work environments have discussed how people use language to make social distinctions in these settings. To begin with, many studies have discussed the construction of *linguistic capital* (Duchêne, 2011; Goldstein, 1997; Gonçalves & Schluter, 2017; Holm et al., 2020; Kraft, 2019, 2020; Piller & Lising, 2014). A general finding of these studies is that only particular communication skills are constructed as linguistic capital (e.g., English speaking skills), even though many other skills are used in daily working practices as well (including skills that may not be conventionally thought of as 'language'). Despite that, speakers without the skills constructed as valuable capital (i.e., minoritised speakers) usually have few opportunities to acquire this capital, either inside or outside the workplace. Thus, the constructions of linguistic capital often privilege certain workers over others, even though the privileged workers may not necessarily experience this as such (Hovens, 2021).

Second, many studies have discussed the (implicit or explicit) constructions of in-groups and out-groups by blue-collar workers themselves (Baxter & Wallace, 2009; Daly et al., 2004; Gherardi & Nicolini, 2002; Holmes & Marra, 2002; Holmes & Woodhams, 2013; Hovens, 2020; Lucas, 2011). Most of these studies have analysed spoken-English discourse, and they have highlighted the use of out-group comparisons (Lucas, 2011), out-group demonisation (Baxter & Wallace, 2009), in-group swearing practices (Daly et al., 2004), in-group humour (Holmes & Marra, 2002), in-group jargon and interactional norms (Holmes & Woodhams, 2013), in-group senses of workplace safety (Gherardi & Nicolini, 2002), and in-group human–machine interactions (Hovens, 2020) as discursive means to construct particular blue-collar in-groups, which are often called *communities of practice* (Eckert & McConnell-Ginet, 1992; Lave & Wenger, 1991; Wenger, 1998).

Third, some studies have discussed the construction of situated *interpersonal workplace relations* through spoken discourse in blue-collar work environments (Handford & Matous, 2015; Holmes & Stubbe, 2015; Holmes & Woodhams, 2013; Kleifgen, 2013). By giving direct and explicit orders to a factory worker, for example, a manager has been observed (re)producing a particular superior-subordinate relationship (Holmes & Stubbe, 2015, p. 33). The situatedness of such constructions is underlined by analyses of problem-solving interactions at work. Specifically, these studies have argued that the time pressure of a given situation may partly explain why people do not use certain forms of politeness, or interpersonal accommodation, that they may otherwise employ in their talk (Handford & Matous, 2015, pp. 95–96; Kleifgen, 2013, pp. 74–98).

Finally, two recent studies have applied the Foucauldian concept *governmentality* to highlight how various technologies (e.g., safety declarations or work cards signed by employees, supervisors and/or interpreters) are used to live up to a constructed standard of safety in blue-collar work environments (Kraft, 2020; Strömmer, 2021). As Foucauldian frameworks include more than human beings and language in the traditional, verbal sense, these studies already hint towards a *posthumanist* perspective

(Latour, 2005; Pennycook, 2018). Overall, however, the overview from this section shows that non-human actants have not received much attention so far. This article thus adds to existing perspectives by including machines as non-human actants in its analysis of blue-collar work interactions. The next section introduces the fieldwork data that constitutes the basis of this analysis.

3 | BACKGROUND, DATA AND METHODS

The ethnographic fieldwork I have executed in the production departments of the metal foundry took place between 3 July and 15 October 2017. In total, I have made 74 hours of audio recordings and 6.5 hours of video recordings of workplace interactions; I have audio-recorded 11.5 hours of interviews with (former) workers, managers and labour recruiters; I have taken 139 photographs of diverse signs, texts and symbols; I have written approximately 150 pages of fieldnotes, and I have collected a wide range of other data. The current article is primarily based on one audio recording and one video recording.

Speaking language varieties other than Dutch, German and Limburgish was a relatively new phenomenon in the foundry in 2017. Many older production workers from Limburg, who typically spoke Dutch and Limburgish as their first languages, considered this 'new' linguistic diversity problematic (Hovens, 2021). The foundry's management considered it problematic as well, and it made various language-political attempts to construct a work environment in which mostly Dutch would be used, even though this aspiration was far away from the *de facto* language practices in the production departments (Hovens, 2021).

The foundry's production workers were distributed over four different departments: the Core Shooting Department (where sand cores were produced to mould metal); the Melting Department (where the metal was melted); the Casting Department (where the molten metal was moulded using the sand cores); and the Finishing Department (where the metal products, after hardening, were sawn, ground, blasted, welded and quality-checked, among other actions). All production workers in the metal foundry were male.

The current article focuses on one work situation that was audio-recorded in the Core Shooting Department, and one work situation that was video-recorded in the Casting Department. Together with the Finishing Department, the Core Shooting Department stood out as an environment with a relatively large share of temporary workers (around 60%), and – related to that – a comparably large share of workers who spoke neither Dutch nor German nor Limburgish. In the Casting Department, on the other hand, almost half of the workers were temporary (48%), and all workers in this department could speak at least Dutch or German (often in addition to other languages such as Limburgish and Turkish).

Another distinction between the Core Shooting and the Finishing Department on the one hand, and the Casting Department on the other hand, concerns the opportunities for human–human interaction during working hours. The Casting Department stood out as it enabled regular interactions involving more than two workers, because people typically worked in groups (of varying sizes) at a conveyor belt there, while people in the Core Shooting and the Finishing Department typically worked alone or in pairs with a particular machine.

The workers of each production department were divided into different teams, which alternated in different work shifts. During my fieldwork, I spent one week with most teams, and I also worked in different shifts (including night shifts). My participation in these teams implied that I helped out as an additional worker, for example, by helping people lift heavy materials. In the Core Shooting and the Finishing Department, I typically went to look for workers whom I could help myself. In the Casting

Department, where the production work was organised around two conveyor belts, I typically discussed with a team manager where I would go and help out during a particular shift.

Due to the size of the workforce (around 500 people at the time, of which more than 300 were production workers), the high turnover rates and my procedure of regularly changing teams, it was impossible to obtain explicit consent from every single worker before my fieldwork started. Therefore, I worked with implicit consent by hanging up a written announcement in three languages (Dutch, English and German) in the workplace, as all production workers were supposed to understand at least one of these languages. The Ethics Review Committee Inner City Faculties of Maastricht University has officially approved this research practice. Nevertheless, I always asked for people's explicit consent before making an audio or a video recording. Usually, people did not have a problem with being recorded on either audio or video, even though I noticed that they were typically quite aware of the presence of a video camera, which thus might have affected their behaviour. In the next sections, I discuss two recorded work situations in further detail.

4 | 'SCREWED' (I): THE CHALLENGE OF HUMAN–MACHINE INTERACTION AT WORK

The main participant in this section is BEN, a younger (<30), temporary worker from Germany who worked in the Core Shooting Department of the metal foundry. His first languages were German and Turkish, and I did not hear him speak any other language. When I met BEN in July 2017, he was still a relative newcomer in the foundry. During the work shift that I analyse in this section, BEN's team manager had assigned him to work alone with a machine for the first time. This could be considered an important transition point, as it showed that the manager no longer considered BEN a 'peripheral' newcomer who could only work together with other, more experienced colleagues (see Lave & Wenger, 1991).

One primary task of production workers in the Core Shooting Department was to lift sand cores from a platform. These cores were placed on this platform by a core shooting machine (Figure 1). Depending on the characteristics of a particular core type (such as its weight), the workers would either lift them by hand or use a hoist. They then checked the cores for possible flaws, and they often had to do certain things with them, such as removing a burr, or gluing two elements together, while using specific tools that could be found on a table behind them. Afterwards, the workers placed the cores on a wooden pallet, except for the seriously flawed or broken ones, which they threw into a sand waste container. Furthermore, they regularly removed some loose, remaining sand from the cores, the pallets, and the work environment with a high-pressure air sprayer. Finally, a forklift truck would come and bring the

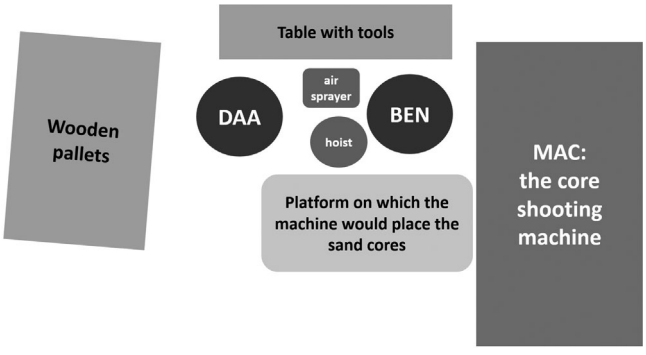

FIGURE 1 The spatial organisation of BEN's workstation. 'DAA' refers to me (Daan Hovens), the author of this article. The sand waste containers were not in BEN's immediate surroundings and, hence, they do not appear on this map

pallets to the next stage of the production process (in the Casting Department). The same truck would also come and empty the sand waste containers every now and then.

When I saw BEN working alone for the first time, I already knew who he was. We had met earlier that week, I had introduced myself and my research project to him back then, and we had decided to speak German with each other. This time, I asked BEN if he would mind me making an audio recording while helping him with his work, for example by lifting the sand cores together. He said that was fine. The only issue was that, with or without my help, he did not manage to be very productive that evening. The machine was producing a lot of broken cores, and he did not understand why this was happening. Therefore, in the end, my help consisted for a large part of throwing broken cores in the sand waste container. BEN seemed to feel quite uneasy about the team manager's possible response to the pile of broken cores that emerged in this way, as he expressed to me in the following line:

> *o:h der chef wird das ja SEHEN (.) dem wird das nicht gefallen (2) dem wird das GAR nicht gefallen (3) im gegenteil der wird sich (gut aufregen)*
>
> **o:h the boss will SEE that for sure (.) that will not please him (2) that will not please him AT ALL (3) on the contrary he will become (quite agitated)**

About 45 minutes after I had joined BEN, the number of broken cores was becoming so big that he decided to stop the production process. Our work assemblage had thus broken down. Since BEN could not interpret any possible signs from the machine indicating what had caused the resistance of this non-human actant in our assemblage, he went to look for help from other, more experienced human workers who might be able to do this interpretation for him.

The first person BEN asked was a younger (<40) man from the Netherlands, who was working with a core shooting machine that was right next to 'ours', and who spoke Turkish as his first, and Dutch as his second language. He was a bit more experienced than BEN, but after they talked with each other in Turkish for a few minutes, it turned out that he could not help. Therefore, BEN went to ask another person. This was WIL, an older (>40) labour migrant from Poland who had worked in the Core Shooting Department for several years already.

WIL spoke Polish as his first, and German as his second language, which he regularly mixed with lexical resources that are typically associated with Dutch. Since Dutch, German and Limburgish are closely related language varieties, however, and since mixing can occur on different linguistic levels (not just the lexical, but also the phonological and syntactical level, etc.), it can be a challenge to categorise specific resources as 'Dutch', 'German' or 'Limburgish' at times (see also Pecht, 2021). For the effectiveness of BEN and WIL's German lingua franca communication, such non-adherence to standardised language norms did not matter though (see also Hülmbauer et al., 2008). A crucial element for the purpose of their communication, on the other hand, was the human–machine interaction that BEN performed in front of WIL by letting the machine produce one more sand core, so that WIL could observe this and hypothesise about the cause. WIL indeed managed to do an interpretation of the machine's utterances in this way, as extract 1 shows. The abbreviation 'MAC' in this extract stands for the core shooting machine, while 'associated with' refers to the lexical level only.

Extract 1. Interpreting machine language

Italics = original transcription (associated with German)

Italics underlined = original transcription (associated with Dutch)

Bold italics = English translation

01	*WIL*:	*wo:w*
	WIL:	***wo:w***
02	***MAC***:	***((makes a snapping sound))***
03	*WIL*:	*wo:w (.) hab ihr nich GESEHEN?*
	WIL:	***wo:w (.) have you not SEEN?***
04	***((5 seconds pause))***	
05	*BEN*:	*A:CH=so=ja:h (.) ja*
	BEN:	***A:H=like that=yeah (.) yes***
06	*WIL*:	*er is undicht (2) au=moet=eh (.) moet wat=eh (.) tuussen zijn*
	WIL:	***he is leaking (2) au=must=eh (.) must something=eh (.) be in-between***
07	*BEN*:	*oka:y?*
	BEN:	***oka:y?***
08	*WIL*:	*e:h (2) tuussen die onderkast (.) bovenkast (.) ist was zwischen*
	WIL:	***e:h (2) between the lower box (.) upper box (.) is something in-between***
09	*BEN*:	*a:h*
	BEN:	***a:h***
10	*WIL*:	*vielleicht e:h (2) ne kleine (ring) ein (xxx) oder so was (xxx) a:h muβ man anschauen*
	WIL:	***perhaps e:h (2) a small (ring) a (xxx) or something like that (xxx) a:h one has to see***
11	***((3 seconds pause))***	
12	*BEN*:	*a:h=nee:h (.) kurz bevor ich auch noch fertig bin (.) kommt das ganze schrott (raus)*
	BEN:	***o:h=no:h (.) just before I am ready on top of all things (.) the entire scrap comes (out)***

According to WIL's observations, MAC was leaking (line 6), and he thought this leakage was caused by something that had somehow got in-between the two boxes that MAC always pressed against each other during the core shooting process (line 8). WIL further speculated that this 'thing' might be a ring (line 10).

Overall, the extract underlines the relevance of including machine-actants in studies of workplace communication. Whereas the use of German as a lingua franca between the two human actants seemed to be relatively unproblematic, the visual, auditory and possibly other signs from MAC were difficult to understand for, particularly, BEN and, to a lesser degree, WIL. Whether this machine produced such signs intentionally or not, or whether it behaved according to some human-made software programme or not, is irrelevant. Clearly, it was not well capable to respond to any circumstantial and interactional details in a way that BEN and WIL did towards each other (Suchman, 2007). This did not discount the fact, however, that the human–machine communication was at least as relevant as the human–human communication for the purpose of letting diverse actants temporarily associate with each other to constitute a new production work assemblage.

5 | 'SCREWED' (II): HUMAN–MACHINE INTERACTION AND POWER DYNAMICS AT WORK

Shortly after the interactions of extract 1, WIL noticed what had been causing the leakage: a crushed screw. BEN asked how this screw could have ended up in-between the boxes of the core shooting machine. WIL said that he had no idea. BEN then asked whether he should go and get the team manager to look at the situation, and WIL replied that he would know what to do indeed. Thus, BEN went to

get the team manager, although he still seemed quite concerned about being blamed, as he expressed to me in the following line:

> *jetzt denkt er sich auch bestimmt (.) denn lässt man den EINMAL alleine arbeiten*
>
> **now he must be thinking as well (.) then you let him work alone FOR ONCE**

The expressed concerns confirm the previously discussed significance of being able to work alone with a machine such as MAC, as this signified the relative independence or maturity of a production worker. Apparently, BEN was afraid that he would fail the 'maturity test' in the eyes of his manager, by not being able to form a production work assemblage with MAC. I responded to BEN by saying that he might become a more technically skilled worker due to experiences such as this one. BEN briefly indicated that he had heard me by saying '*ja'* ('yeah'), but he did not seem comforted.

In the end, it appeared like BEN did not need to worry about being blamed. When the team manager approached our workstation, he started to laugh and said (in German, combined with the Limburgish pronoun 'dae'): '*wo kommt DAE her?'* ('where does THAT come from?'). The team manager was an older (>40) man from Limburg, the Netherlands, who spoke Dutch and Limburgish as his first, and German as his second language, which he regularly mixed with lexical resources that are typically associated with Dutch or Limburgish. Visually, he had the same working outfit as any other production worker, so his distinct position in the workplace had to be (re)produced via other means. His laughter and linguistic accommodation, with which he seemingly tried to comfort BEN, are examples of such means. In this way, the manager discursively (re)produced the idea that he was in the position to declare that there was no reason for BEN to be worried.

After this brief interaction, the manager started to inspect the crushed screw and said (in German) that he needed a screw driver. It appeared that his attempts to comfort BEN had not been sufficiently effective yet, however, as is shown by another brief interaction between BEN and the team manager (MAN) that followed (extract 2).

Extract 2.'That was nobody'

Italics = original transcription (associated with German)
Italics underlined = original transcription (associated with Dutch)
Italics underlined with asterisks = original transcription (associated with Limburgish)
Bold italics = English translation

01	*BEN*:	*ich war das nicht*
	BEN:	***it wasn't me***
02	*MAN*:	*huhahahahahahahahaha (1) das war keiner (5) *den*=e:h (.) hol maar even ne=ne=ne (.) hammer (.) und=ne schraube-zieher*
	MAN:	***huhahahahahahahahaha (1) that was nobody (5) then=e:h (.) just quickly get a=a=a (.) hammer (.) and=a screw driver***

Again, as this interaction shows, the team manager did not seem interested in blaming BEN. Rather, it appeared that he wanted to take care of the issue as quickly as possible so that a production work assemblage could emerge again. Thus, similar to the sites studied by Kleifgen (2013) and Handford and Matous (2015), working speed was of central importance here. To achieve such speed, the team manager tried to take care of both a non-human actant (the crushed screw) and a human actant (BEN). Both resisted a quick emergence of a new work assemblage: the screw due to the leakage it caused, and BEN due to the concerns he expressed about blame. Regarding the first actant, the manager told BEN

to get a hammer and a screw driver, with which he wanted to remove the crushed screw from MAC. Regarding the second actant, the team manager gave a prolonged laugh and said 'that was nobody' in an attempt to remove BEN's concerns about blame.

Unfortunately, it turned out that the resistance of the crushed screw was so strong that the team manager could not remove it with a hammer and a screw driver. Therefore, he decided to use an angle grinder instead, with which he could make the surface of MAC's box even again. This seemed to work well. While the manager-angle grinder assemblage was producing observable effects in this way, BEN asked the manager how the screw could have got inside the machine. Like the crushed screw, BEN's concerns seemed so strong that they could not be easily removed either. Extract 3 shows BEN's question and the interaction that followed afterwards.

Extract 3.'It's better when it's here than there'

Italics = original transcription (associated with German)

Italics underlined with asterisks = original transcription (associated with Limburgish)

Bold italics = English translation

01	*BEN*:	*wie konnte das denn passieren?*
	BEN:	***how could it have happened then?***
02	*MAN*:	*weiß ich nicht (.) WENN (.) ei=eine schraube ist von e:h (1) von die:h (.) der begasswagen der ist (xxx) der seite wo der (.) mit DRÜCK der kern in der abdrück (bleiben) gedrückt (.) dass DE:R rausgelaufen ist (1) (xxx) dazwischen gefallen*
	MAN:	***I don't know (.) WHEN (.) a=a screw is from e:h (1) from the:h (.) the gas carriage it has (xxx) the side where it (stay) pressed the core (.) with PRESSURE into the imprint (.) so that IT leaked out (1) (xxx) fallen in-between***
03	***((3 seconds pause))***	
04	*BEN*:	*(scheiße)*
	BEN:	***(shit)***
05	***((3 seconds pause))***	
06	*MAN*:	*ega:l*
	MAN:	***it doesn't matter***
07	*BEN*:	*(passiert auch immer nur mir so was)*
	BEN:	***(things like that happen only to me all the time)***
08	*MAN*:	**jao:h**
	MAN:	***yeah***
09	*BEN*:	*[hehehe]*
	BEN:	***[hehehe]***
10	*MAN*:	*kann besser HIER liegen als DA*
	MAN:	***it's better when it's HERE than THERE***
11	*BEN*:	*(xxx) (da sein)*
	BEN:	***(xxx) (be there)***

Similar to extract 2, this interaction shows that the team manager did not seem interested in blaming anyone, which he now also made explicit by saying '*egal'* ('it doesn't matter'; line 6). Still, BEN brought up the matter of blame again by saying 'things like that happen only to me all the time' (line 7), as if his presence or involvement had something to do with the screw getting inside MAC. It is not clear if the manager understood these words, but by saying that it is better when the screw is 'here'

than 'there' (line 10), he made another attempt to comfort BEN, by implying that the situation could have been worse still.

Unfortunately, I cannot hear BEN's final response (line 11). Based on what happened afterwards, however, he seemed not to feel at ease still. About 5 minutes after the interaction of extract 3 had occurred, BEN tried to minimise any potential blame again by telling the manager that this was the first time that something like this had happened to him. In response, the manager tried to make clear again that it did not matter. Furthermore, shortly after the manager had left our workstation, BEN told me that he was still wondering how a screw could have got inside the machine. It appeared, in other words, that the manager had not entirely managed to remove BEN's concerns.

Overall, the two 'screwed' sections have shown how a crushed screw initiated a breakdown of a production work assemblage, and how different human actants tried to influence other human and non-human actants so that a new work assemblage could emerge again. The individual responsibilities for this process were more or less taken for granted. Furthermore, the section has shown that BEN and the team manager (re)produced an interpersonal workplace relation that placed the latter in the position to blame any human worker for MAC's resistance, which he decided not to do.

Despite his repeatedly uttered decision, however, the team manager did not successfully remove BEN's expressed concerns about blame, which simultaneously undermined the manager's position to decide about these matters, and which delayed the emergence of a new production work assemblage. The manager made several attempts to comfort BEN by employing, among others, laughter and linguistic accommodation (by using lexical resources associated with German). The fact that these attempts did not turn out to be successful confirm the idea that the manager did not simply 'have' power (Latour, 1986). As with the crushed screw, all he could do was to mobilise certain actants or resources (an angle grinder, extensive laughter) and hope that these would link up with particular other actants (the crushed screw, BEN) and produce a desired effect (as a new production work assemblage). Thus, in the end, MAC's initiated renegotiation of BEN's newly obtained position as a less peripheral worker also led to a (re)negotiation of the team manager's position as the ultimate judge with regard to matters of blame.

6 | 'STOPPEN' (I): HUMAN–MACHINE INTERACTION AS INTER-ACTANT RELATIONS AT WORK

The situation analysed in this section is set in the Casting Department of the metal foundry. As discussed previously, this department provided more opportunities for work interactions between more than two human actants. Whereas people typically worked alone or in pairs in the Core Shooting Department, most people in the Casting Department worked in one out of two groups, each of which worked at a different conveyor belt. At the first, larger conveyor belt, people placed sand cores (which forklift truck drivers brought from the Core Shooting Department) onto the belt. This belt transported the sand cores to the casting machine, which cast the foundry's metal products. The products, when cast, were transported by hooks (which were connected to rails in the ceiling) to the second, smaller conveyor belt. The main task of people working at this second belt was to cut certain redundant parts off the products. Hence, this belt was commonly referred to with the Dutch noun '*kniptafel*', which literally means 'cutting table' (Figure 2).

Figure 2 shows the spatial organisation of the workers at the cutting table during one night shift, when I briefly participated in their work practices. This organisation seemed to follow a hierarchical logic, (re)producing interpersonal workplace relations. At the head of the table was NED, an older (>40) worker from Germany who had worked in the foundry for many years already, and who spoke German as his first, and Dutch and Limburgish as his second languages. His task was to take the metal

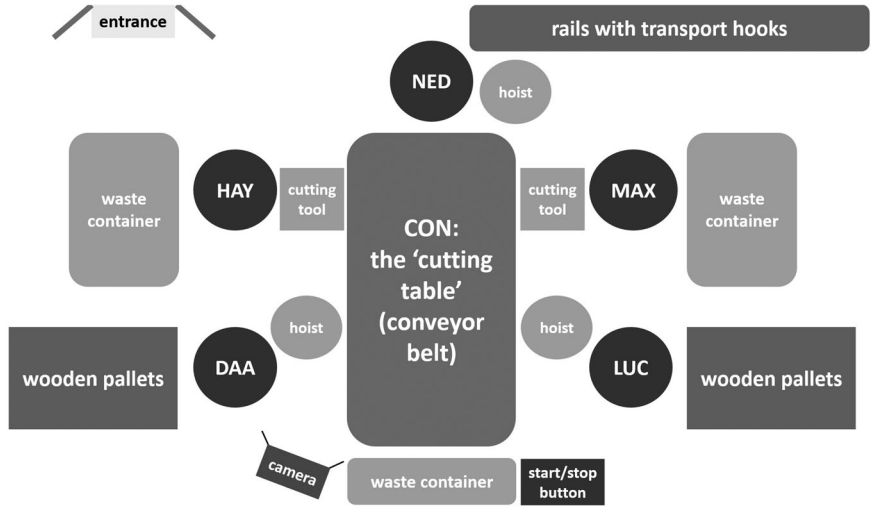

FIGURE 2 The spatial organisation of the workers at the cutting table

products off the transport hooks and place them on the cutting table. The products would then first pass HAY and MAX, who were both relatively experienced workers as well, and who were doing the cutting job. HAY was an older (>40) worker from the Netherlands whom I believe could speak Dutch and Limburgish as his first, and German as his second language, but I hardly heard him speak overall. MAX was a somewhat older (>30) worker from Germany who spoke German as his first language, and he also used specific words that are typically associated with Dutch or Limburgish at times (see further below). At the end of the table were LUC and I (DAA), two relative newcomers who would lift the metal products from the belt and place them on wooden pallets behind us. LUC was an older (>40) worker from Germany who spoke German as his first language, and I did not hear him speak any other language. I was a younger (<30) worker from the Netherlands at the time, and I spoke Dutch and Limburgish as my first, and German as my second language.

While I was working at the cutting table, the conveyor belt (hereafter: CON) had to be paused several times, because the two newcomers (i.e., LUC and I) could not keep up with its speed. As far as I understood, the speed could not be changed. CON thus did not accommodate to us, but instead communicated the norm for our working speed. One of the few ways to go against such norms was to press the 'on/off' button. Typically, NED and MAX said when this button had to be pressed. In this way, they placed their own authority above that of the belt. Hence, in the work assemblage that these human and non-human actants constructed that night, HAY, LUC and I were trying to obey CON's speed dictations, unless NED and/or MAX said that it should be paused. Thus, we were (re)producing particular situated, hierarchical interpersonal – or rather: inter-*actant* – workplace relations with NED and MAX on top, CON in the middle, and HAY, LUC and I at the bottom.

Similar to the team manager from the previous section, however, NED and MAX did not simply 'have' power. Instead, they were depending on the cooperation from diverse human and non-human actants for the work assemblage and its inter-actant relations to emerge and be reproduced. When it comes to CON, I did not detect any resistance (such as a technical issue) against this organisation during the work shift. HAY seemed to be cooperative as well. As for myself, I was cooperative too, since I was quite happy about everyone agreeing with me making a video recording. Therefore, in order to maintain my 'research assemblage', I did not want to cause any trouble.

LUC, on the other hand, resisted several times, as the next section will show. He thus did not take the situated, inter-actant workplace relations for granted. LUC was working right next to CON's 'on/off' button (Figure 2). Hence, when NED and MAX thought that the belt had to be paused, one of them – but mainly MAX – would usually order LUC to press this button. Interestingly, even though LUC, NED and MAX all spoke German as a first language, and even though I never heard LUC speak any Dutch, MAX used Dutch words when he ordered LUC to turn on CON (in which case he would use the verb '*lopen!'*, which literally means 'walk!', and which could be translated as 'let it run!'), or to turn off CON (in which case he would use the verb '*stoppen!'*, which means 'stop!'). One possible interpretation of this is to consider these verbal resources as institutional key words from a shared repertoire in the Casting Department's community of practice, and MAX's orders might have been a way to share such resources with LUC. An alternative or additional interpretation is that MAX used these words as a means to present himself as a member of this in-group, thereby legitimising or (re)confirming his hierarchical position at work. In that sense, MAX's utterances were examples of strategic code-switching (Muysken, 2000) as opposed to the more improvised languaging practices from the participants in the previous sections.

Overall, this section has underlined the relevance of including machine-actants when analysing the construction of situated, interpersonal workplace relations, which I have called 'inter-*actant* workplace relations' for that reason. Clearly, CON played a key role in the emerging hierarchical constellation of the observed production work assemblage. For MAX, it appeared to be of central importance that several actants in this assemblage would link up in such a way that CON either 'ran' or 'stopped' after he said so, while CON itself, when actively running, communicated a working speed norm. For LUC, this constellation did not seem to be acceptable, however, as the next section will show in further detail.

7 | 'STOPPEN' (II): HUMAN–MACHINE INTERACTION AS A RENEGOTIATION OF INTER-ACTANT RELATIONS

The first time the work assemblage at the cutting table broke down happened about 7 minutes after I had joined. LUC and I could not keep up with CON's speed, and therefore, MAX ordered LUC to stop the belt (using the Dutch verb '*stoppen!'*). LUC was busy trying to keep up with the speed, however, so he did not respond and continued his work. With an angry voice, MAX made clear to LUC in German what he was supposed to do: '*drück doch auf aus!'* ('just press off!'). In response, LUC questioned (in German) the assumption that he would always have to be the one pressing this button: '*tu das selber eben mal!'* ('do it yourself just once!'). However, when MAX pointed at the products that were about to fall off CON (while saying something I cannot understand), LUC decided to press 'off' in the end, and so the assemblage broke down.

When LUC and I had managed to catch up a bit, NED ordered LUC to make CON start again by using the German verb '*laufen!'* (which means 'walk!' as well). MAX followed quickly, and used (with a louder voice) the Dutch verb '*lopen!'* several times. LUC did not respond verbally, however, and continued what he was doing (fixing some wooden pallets behind him). About 30 seconds after receiving the orders from NED and MAX, he decided to press the 'on' button, underlining his individual agency as a human actant in this work assemblage.

The second breakdown happened more or less 4 minutes later. This time, LUC initiated a renegotiation of the inter-actant relations in the work assemblage by pressing the 'off' button on his own initiative. Interestingly, this resistance from a human actant and relative newcomer such as LUC would not have been possible without CON enabling people to press an 'on/off' button. Indeed, if CON's job (i.e., transporting products) had been done by, say, a line of human workers instead, LUC would have

had to put much more effort into causing a breakdown. In other words, CON, as a machine-actant, afforded LUC's resistance. Extract 4 and Figures 3 and 4 (below) show the interactions that followed upon this resistance. As opposed to the previous extracts, I have presented this one in a table-like manner, highlighting the simultaneity of the ongoing verbal and non-verbal interactions that were captured on video.

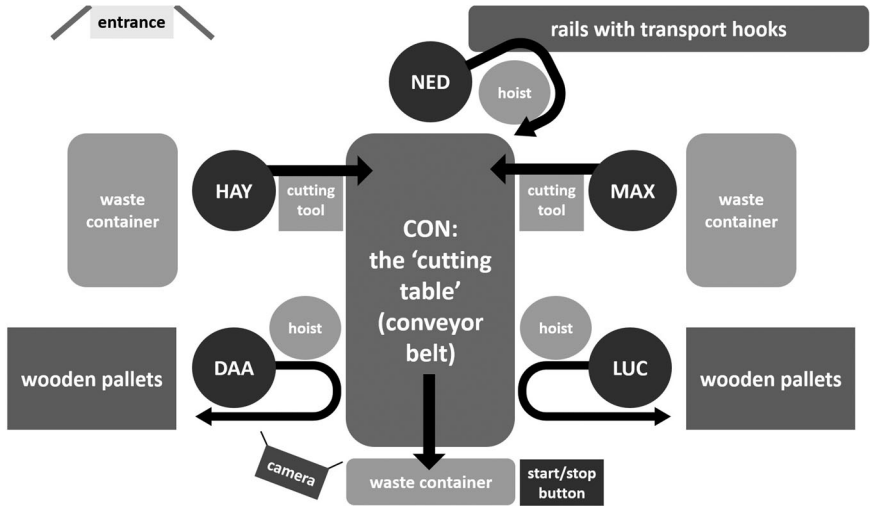

FIGURE 3 The spatial organisation of the workers at the cutting table during line 1 of extract 4. The arrows indicate the direction of the work actions and the gazes of the human participants, as well the running direction of the conveyor belt (CON)

Extract 4. LUC's resistance

Text with no special fonts = description of non-verbal action
Empty cell = the same description as above still applies
Italics = original transcription (associated with German)
Italics underlined = original transcription (associated with Dutch)
Bold italics = English translation

	CON	NED	HAY	MAX	DAA	LUC
1	running	places products on CON	cut products		lift products from CON	
2					do not keep up with CON'sspeed	
3					continues lifting products from CON	presses the 'off' button, lets his hoist swing in the air, and starts fixing some pallets behind him

4	stops running					still fixing the pallets
5		look at LUC				
6			looks at NED			
7				turns around, looks at LUC and says:*MAAR MAAR MAAR MAAR MAAR* ***MY MY MY MY MY***		
8			look at LUC			
9		says with a soft voice: *was ist los? (.) (kraan kaputt?)* ***what is going on? (.) (hoist broken?)***		looks at CON and continues cutting		
10		looks at HAY, then at MAX	looks at NED	laughs out loud		
11		looks at LUC with anannoyed facial expression and his arms hanging passively alongside his body	look at CON and continue cutting			
12				looks at LUC, says with a loud voice: *hey was ist los (.) KRAAN kaputt?* ***hey what is going on (.) HOIST broken?***		

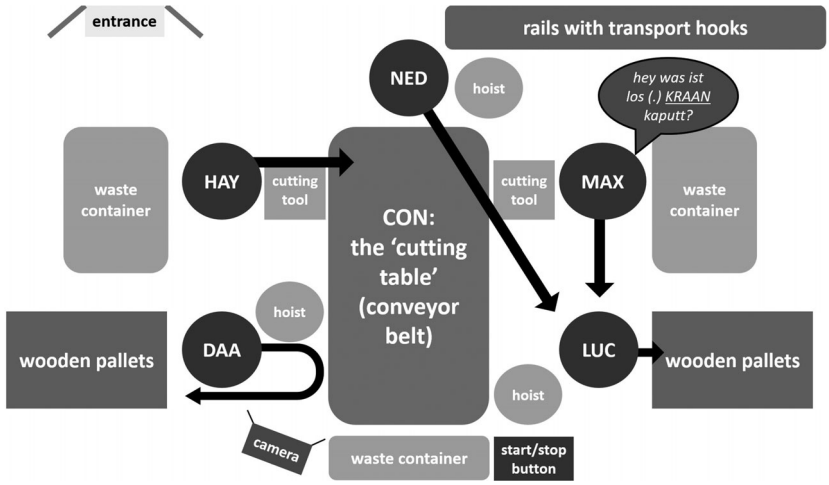

FIGURE 4 The spatial organisation of the workers at the cutting table during line 12 of extract 4. The arrows indicate the direction of the gazes of the human participants. The text balloon shows the verbal utterances from MAX ('hey what is going on (.) HOIST broken?')

	CON	NED	HAY	MAX	DAA	LUC
13		looks at CON		looks at LUC		starts lifting products from CON again
14		starts placing products on CON again				
15		cannot place products on CON anymore, looks in the direction of MAX and LUC	stops cutting, looks at CON	looks at LUC with one hand resting on his waist, such that his arm forms a triangular shape		
16				looks at HAY, pauses, then looks at NED, and pauses again		
17		looks at MAX and nods his head, while raising his eyebrows and moving his lips		looks at NED		
18			looks at LUC	looks at LUC and says: *LOPEN* **LET IT RUN**		
19		look at CON				presses the 'on' button
20	starts running	continues placing products on CON	continue cutting			continues lifting products from CON

Similar to the previously analysed case from the Core Shooting Department, extract 4 shows that the breakdown was followed by a moment of people observing a resisting (in this case human) actant (lines 5 and 7). HAY's quick gaze at NED (line 6) may also indicate who was considered responsible for dealing with the resisting co-worker (i.e., NED). MAX appeared to be more pro-active in this respect again, however (line 7). Furthermore, the interactions from extract 4 show the diverse interactional resources that primarily NED and MAX employed in their attempts to break LUC's resistance, so that a production work assemblage could emerge again with a working speed dictated by CON, or perhaps NED and MAX, but at least not by LUC. One such resource was the act of looking at LUC (e.g., in lines 5 and 8), which might have made him feel more self-conscious. One additional resource was body language (in lines 11 and 15), with which both NED and MAX signified non-verbally that LUC was making them wait, and that they were annoyed by that. Moreover, NED and (particularly) MAX were also employing Dutch language resources again (although the Dutch noun '*kraan'*, in lines 9 and 12, may be interpreted as the German noun '*Kran'* as well), thereby presenting themselves as members of an in-group.

'*Maar maar maar maar maar'* (line 7) literally means 'but but but but but'. Its prosodic structure appears to be more important than its literal meaning, however, which is why I have translated it as 'my my my my my'. More specifically, it functioned as a running joke in the Casting Department, where it was typically used to mock someone who had just done something wrong (such as dropping something). Hence, this phrase can be considered a verbal artifact from a shared repertoire in the Casting Department's community of practice. Probably, a repetitive phrase like this could thrive there as it enabled understanding in a work environment with loud sounds from tools and machines, and sometimes large physical distances between people. The exact origins and spread of the phrase are unknown, but it is commonly used in the Dutch province of Limburg. Thus, by using it, MAX once again positioned himself as a member of an in-group, which could be interpreted as an attempt to legitimise the situated, hierarchical inter-actant workplace relations that night.

Despite the numerous interactional attempts from NED and MAX to discipline LUC, however, the latter continued focussing on his tasks while not giving any verbal response. Only in line 19, after MAX had used the Dutch verb '*lopen!*' again, LUC indicated that he had noticed his co-workers by pressing the 'on' button. During the break that followed upon these interactions, and during which we gathered at a smoking section outside the foundry building, LUC explicated his frustrations to MAX (in German) by angrily telling him that his continuous shouting got on his nerves, while he should have some understanding for the fact that there were two newcomers (i.e., he and I) working at the cutting table that night. In other words, despite obeying the order from MAX in line 19, LUC underlined that MAX did not simply 'have' power, although his demand for understanding arguably implied that he did consider MAX to be in the position to grant him the status of a legitimate peripheral participant whose comparably low working speed should be temporarily tolerated (Lave & Wenger, 1991).

Overall, this section has highlighted the role of machine-actants as affordances for the renegotiation of inter-actant workplace relations in a production work assemblage, while it has also shown how human actants may discursively try to restore a previous constellation when someone (in this case, LUC) starts such as renegotiation. A final question is how much the behaviour of LUC, MAX, and the other human actants was affected by the presence of my video camera. In several non-analysed parts of the recording, there are moments when MAX shows that he is aware of this camera, as he for example points at it or verbally refers to it. Since it was not unusual for people to think that my recordings would reach the foundry's management (even though I always denied that this would be the case), it is possible that MAX showed what he might have thought of as desirable behaviour in the eyes of the management. Hence, he might have felt more pressure to go against any breakdown of the work assemblage, and more eager to use Dutch rather than German words. As for LUC, he might

have felt more strongly that he did not want to be humiliated by MAX while being filmed. Thus, it seems plausible that the video camera, as a non-human actant in the emerging assemblages, amplified or exaggerated certain behaviours among the human actants, and in that way also affected the data that I have discussed here.

8 | LINGERING THOUGHTS

Overall, sociolinguistic-ethnographic studies of blue-collar work environments have discussed how people use language to make social distinctions between people at work. In this article, I have discussed the relevance of including machine-actants in these studies, as they appear to play an active role in social distinction-making processes. In this final section, I discuss a few lingering thoughts.

First of all, the article shows that it may be fruitful to not only think about *linguistic capital* as certain language varieties being more 'valuable' than others, but also in terms of which communication practices are considered *language* in the first place (see also Cornips & Van den Hengel, 2021; Kusters & Lucas, 2022). Defining what counts as *language*, and what not, is not politically innocent, but related to a long history of ideas where language is associated with rationality, intelligence, and distinctions from non-human nature (Cornips & Van den Hengel, 2021, pp. 179–183). Hence, just like we may have to critically evaluate whether to continue using the term 'blue-collar' or not (Gonçalves & Kelly-Holmes, 2021), we may have to ask whether we should continue using terms like 'language-marginal' and 'language-centred'. The empirical data from this article have shown that communication entails very diverse actions, ranging from a human actant producing gestures to a machine-actant producing sounds, and that all these actions matter for the achievement of specific communicative purposes, no matter whether they are produced intentionally or not. Thinking about communication in this way may require a new way of thinking about proficiency (Canagarajah, 2018), and, by implication, an expanded, critical evaluation of which types of proficiencies are considered 'valuable' linguistic capital.

Second, the article has shown a number of possibly fruitful directions to take when machines are considered *actants* in sociolinguistic ethnographies. One such direction is to consider the impact of machine-actants (which may produce loud sounds, and which may afford expeditious work practices with large physical distances between people) on the verbal resources that are used at work (e.g., '*stoppen!'* and '*maar maar maar maar maar'*). Another direction is the inclusion of machine-actants in discourse-analytical studies of *inter-actant* (rather than *inter-personal*) *relations*. Considering, for example, that the team manager (MAN) did not seem capable of removing BEN's expressed concerns about being blamed, one wonders who or what really was discursively placed in the position to decide about BEN's status at work: MAN or MAC? Similarly, both in theoretical and methodological terms, it may be valuable to consider what inter-actant relations with a video camera are being (re)negotiated in a video-recorded interaction. Finally, one direction is to consider the role of machines as experts sharing resources with newcomers in a *community of practice*, as I have done elsewhere (Hovens, 2020). After all, and as the current article has shown as well, the very least we can say is that machines share resources in the sense of observable data that we, sociolinguistic ethnographers, can further discuss and reflect upon in our work.

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CONFLICT OF INTEREST

Not applicable.

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APPENDIX A

Transcription conventions

The transcription symbols used in this article belong to the conventions from the *Gesprächsanalytisches Transkriptionssystem 2* (GAT 2; Selting et al., 2009). Due to specific workplace conditions (such as loud sounds) and the general aims of this article, I have made a few minor adjustments to these conventions. For example, I have not counted the syllables of unintelligible speech, and I have not differentiated between pauses shorter than 1 second.

Pause in seconds	(1)
Micro pause (shorter than one second)	(.)
Overlapping speech	[hehehe]
Transcriber unsure	(quite agitated)
Unintelligible speech	(xxx)
Contiguous utterance	=
Sound lengthening	:
Emphasis	SEE
Questioning intonation	?
Additional description from transcriber	((makes a snapping sound))