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Journal of Pragmatics

journal homepage: www.elsevier.com/locate/pragma

Directives in the construction site: Grammatical design and work phases in second language interactions with crane operators

Paweł Urbanik

Center for Multilingualism in Society Across the Lifespan, University of Oslo, Postboks 1102, Blindern, 0317 Oslo, Norway



ARTICLE INFO

Article history:

Received 4 September 2020

Received in revised form 11 February 2021

Accepted 12 February 2021

Available online 27 March 2021

Keywords:

Directives

Construction site

L2 Norwegian

Conversation analysis

Overall structural organization

Grammatical design

ABSTRACT

The paper investigates directives addressed to tower crane operators by a construction worker. By examining grammatical variation in connection with load relocation tasks, the study shows how the design and the sequential positioning of directive turns vary systematically according to a particular phase of the work task and the overall structural organization of the activity. The worker's selection of lexico-syntactic forms and embodied actions displays an orientation to the different stages of the work task being carried out. The sequential, compositional and morpho-syntactic differences in the formation of directives serve to manage and display task progressivity. The worker speaks L2 Norwegian with several unidiomatic features, but nonetheless displays a systematic differentiation between the forms in orienting to the sequential and phase-structural characteristics of the actions being performed.

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1. Introduction

The language is meant to serve for communication between a builder A and an assistant B. A is building with buildingstones: there are blocks, pillars, slabs and beams. B has to pass the stones, and that in the order in which A needs them. For this purpose they use a language consisting of the words "block", "pillar", "slab", "beam". A calls them out; B brings the stone which he has learnt to bring at such-and-such a call. Conceive this as a complete primitive language. (Wittgenstein, 1953/1958:3)

In this well-known example of a basic language game, Wittgenstein mentions two general characteristics that explain the rules of the game. The first one, elaborated in many philosophical studies, concerns the use of single words for objects – sufficient to be recognized as directives given their contextual adequacy and the distribution of agency. The second one, paid less attention to but directly connected to the relevance of words for objects after each call, concerns the “order in which A needs” particular objects, pointing in fact towards the sequential organization – or, in Garfinkel's terms (2019), “the constitutive order” – the whole game is built upon. This reveals a crucial feature of the game – a link of interdependence between the structural order of routinized work and the design of commands (cf. Sacks, 1992/1995:163).

E-mail address: p.k.urbanik@iln.uio.no.

<https://doi.org/10.1016/j.pragma.2021.02.016>

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On construction sites, directives are most often used to make things happen in the course of joint projects. Thus, rather than merely getting others to do something, they normally serve to coordinate and link the stages of joint actions in which each step is supposed to lead to a concrete, pre-determined aim and the entitlement to expect compliance is warranted by the institutional roles associated with the division of labor. Routine here not only reduces linguistic redundancy but also carries projections of subsequent stages. Since effectiveness and good orchestration are crucial in this kind of tasks, directives are usually short, lexically and syntactically simple as well as highly routinized, just like the ones from *Philosophical Investigations*.

However, the question that remains unanswered is: How is it that so simple forms are enough to carry out complex tasks that require temporal and spatial synchronization of work with big machines as well as collaborative precision? What, in other words, are the formal properties of a work routine that facilitate linguistic simplicity? And finally: How are directives used when one of the workers is a second language speaker? Multilingual workers are commonly present in many construction sites nowadays, which at first glance seems to make the whole game more complex, as even grammatical simplicity may be realized differently. Therefore, one step further in explaining the “completeness” of the language in the construction site is to explore the significance of its variation in relation to the progression of the task and how this becomes or is made relevant in a language that is not the speaker's first language.

Although Wittgenstein's constructed example has been foundational in reorienting linguistics and philosophy towards language in actual use, very few researchers have gone into the field to investigate how directives are actually realized on construction sites. The present study does exactly this by analyzing an empirical corpus of naturally occurring directives formulated by a construction worker to crane operators in order to relocate various building materials. The construction worker is a Pole ('Tomasz') who has learned Norwegian as a second language (L2) 'in the wild', that is, mainly by interacting with Scandinavians at workplaces in Norway. The analysis focuses on the lexical and morpho-syntactic variation in directives used in communication with tower crane operators to coordinate load relocation. A closer look is taken at how directive formats that almost exclusively build up interactional sequences with the crane operator reveal Tomasz' orientations to work phases and the details of local configurations. The aim of this study is twofold. First, by outlining the repertoire of directives from load relocation tasks, it seeks to uncover the structural order that underlies the selection of certain lexico-syntactic forms and thus reveals how the details of task progressivity are recurrently made relevant in Tomasz' L2 Norwegian. Second, by applying Conversation Analysis (CA) to the demarcation and systematic analysis of work phases, the study aims at formally describing sequential properties of directives in the overall structural organization of this workplace activity.

2. Directives in the workplace – from sociolinguistics to conversation analysis

With a growing body of conversation-analytic research on directives in recent years, we have been provided with a more diverse and complex picture of their use in a variety of settings – from everyday interactions in the kitchen to surgical operations at a hospital. However, construction sites have been absent from this spectrum. Yet, there are some studies examining directives in other workplace settings, ranging from blue-collar contexts where work activities involve manual, physical labor (Bernsten, 1998; Weigel and Weigel, 1985; Holmes and Stubbe, 2003) to white-collar contexts where work activities comprise administrative and managerial tasks (Holmes and Stubbe, 2003; Koester, 2010; Saito, 2011; Vine, 2004, 2009). Most of this research is done within interactional sociolinguistics, explaining the selection of formats through the prism of power relations, politeness and some general contextual features such as urgency, division of responsibility, affective motivations, discourse genre and the like. By providing overviews of distributional and contextual patterns, researchers have observed, for instance, that imperatives and other “direct” forms are common particularly among blue-collar workers, especially when used to subordinates, and in routine tasks (Bernsten, 1998; Weigel and Weigel, 1985; Holmes and Stubbe, 2003). On the other hand, the so-called indirect forms (more typical of white-collar settings) are claimed to follow affective motivations and politeness concerns related to the division of roles (Holmes and Stubbe, 2003; Koester, 2010).

A number of conversation-analytic studies of directives have already shown that such explanations are not exact enough and do not provide valid distinctive reasons for the grammatical variation of directives. Recent studies of everyday and institutional settings have demonstrated how the intersubjective relevance of various configurational features is consequential for the choice of a directive format. Urgency, noted in numerous studies in pragmatics dating back to the 1980s, may be one of them, explaining why, say, a factory worker uses imperatives to his colleague. But imperatives are easily chosen when urgency is absent and there is neither hierarchical asymmetry between workers nor emotions in play. Here CA comes with several explanatory solutions. First of all, it emphasizes the importance of collaborative joint actions as situational frames in which compliance is expected and warranted by mutual commitment to a common goal (Rossi, 2012; Zinken and Ogiermann, 2013), which explains why the frequency of imperatives in task-related interactions in blue-collar settings is high. Furthermore, as for grammatical variation, CA directs attention to the speaker's local claims of entitlement (Craven and Potter, 2010; Curl and Drew, 2008; Heinemann, 2006; Lindström, 2005), his/her orientation to (potential or real) contingencies (Craven and Potter, 2010; Fox and Heinemann, 2016; Urbanik and Svennevig, 2019), agency and responsibility distribution (Clayman and Heritage, 2014; Enfield, 2014; Zinken and Ogiermann, 2013), spatio-temporal constraints (Fox and Heinemann, 2020; Mondada, 2014) and material configurations (Urbanik, 2020), among others. These studies emphasize that prior talk, participation framework, the material environment of interaction, the activities participants are involved in and the embodied and social actions they perform may be consequential for the shape of directive turns. Finally, studies on directives within certain activities, such as card games or surgical operations, point to the significant role of directive formats in the

temporal organization of the on-going project, the management of its progressivity, and action projection (Mondada, 2014; Raevaara, 2017; Taleghani-Nikazm et al., 2020).

Although the present study primarily focuses on the design of directives in work phases, it also touches upon the issue of second language in interaction. To my knowledge, the only study that provides an overview of the repertoire of directives used in authentic interactions in the workplace by a second language user is Streeck (2017), although it does not systematically examine the sequential organization and contextual features of directive turn designs. Recent conversation-analytic research on L2 interactional competence (Hellermann et al., 2019; Pekarar Doehler, 2013), including learning in the wild (Svennevig, 2018; Wagner, 2015) and requesting (Al-Gahtani and Roever, 2012, 2013; Taleghani-Nikazm and Huth, 2010), shows that a systematic sequential analysis of the resources L2 speakers employ in interaction provides insight into how they – by means of these resources – adapt to local circumstances in order to deal with their interactional needs. The current study contributes to this research by demonstrating that grammatical variation in L2 directives follows recurrent patterns and reveals the L2 speaker's locally relevant orientations to the structural characteristics of his work activities.

3. Overall structural organization and action formation

Although the significance of overall structural organization was emphasized in the early days of conversation analysis (Levinson, 1979; Sacks, 1992/1995:157; Schegloff and Sacks, 1973), a relatively small number of distinct activity types have so far been examined. Yet, the studies have demonstrated that the underlying pattern of higher-level structures is jointly oriented to by participants and is relevant for the linguistic choices they make. Based on those results, one can identify several characteristics of the structural organization of activity types.

First of all, activities tend to be organized around overarching goals (Levinson, 1979; Mazeland, 2019; Zimmerman, 1992). The path leading to the achievement of a superordinate goal can be organized as a series of smaller sequential structures – sub-activities or phases with their own aims. Such phases usually have their own internal arrangement and more or less clear boundaries participants orient to when transitioning from one phase to another (Kuroshima, 2014; Levinson, 1979; Mazeland, 2019; Robinson, 2003; Robinson and Stivers, 2001). Some verbal and nonverbal resources can be particularly designed to mark transitions between activities (Robinson and Stivers, 2001) or to “sustain orientation to the activity” (Heritage and Sorjonen, 1994). The underlying organizational patterns of activities jointly shared and oriented to by participants form the basis for “the constitutive expectancies” (Garfinkel, 2019) and thus rules of inference (Levinson, 1979). This, in turn, not only facilitates action and activity recognition but provides space for action projection, structural repetition and progressivity management by means of the mutual monitoring of coherence and organizational and linguistic adequacy (Kuroshima, 2014; Levinson, 1979; Mazeland, 2019; Robinson, 2003; Zimmerman, 1992). Finally, activities differ in their type of underlying structure and reliance on accompanying activities. Some of them follow the order of practical actions they grow out of and are bound up with while other activities are constituted merely by the sequences of talk (Mazeland, 2019). A high degree of reliance on the structure of accompanying practical tasks allows, at least in some settings, less flexibility in terms of contributions and spatio-temporal constraints.

Mazeland (2019) uses the Goffmanian notion of “situated activity system” (Goffman, 1961/1972) to conceptualize the routinized formation of superordinate structures. Clearly, participants navigate within activities at the lowest level of interactional organization – through a turn-by-turn and sequence-by-sequence order of emerging contributions and joint coordination of them. At the same time, they reveal orientations to what is the expected product at a higher structural level, making use of standardized tools, and relying on schematic, recurrently redistributed scenarios (as orientation frames).

An aspect that has not so far received attention is how these linguistic routines reveal orientations to higher-level structures when the whole activity's structural organization is based on a single type of action (and a few grammatical formats). This is the case of directive-based activities in the present study where the speaker produces threads of directives and the recipient merely performs the indicated actions. Recent studies on directives within activities do mention and acknowledge the role of the “presupposed underlying pattern” (Garfinkel, 1967:78) or “underlying structure of activity” (Taleghani-Nikazm et al., 2020) to which actions are adjusted (Goodwin and Cekaite, 2014; Raevaara, 2017) but they mainly focus on how directives contribute to and build up this structure, much less on how the whole activity and its phases also participate in shaping the formatting and the sequential position of “allowable contributions” (Levinson, 1979). This study fills this gap by systematically analyzing the activities of load relocation in their complete structural organization (from opening to closing), looking at how their bottom-up structuring interplays with their top-down constraints. Thus, rather than taking the *within-activity* perspective, the study employs a *throughout-activity* perspective in the sequential analysis of directives (cf. similar approaches in Kuroshima, 2014; Robinson, 2003; Zimmerman, 1992).

The notion of activity used here encompasses both a superordinate structure (a whole task or a mega-activity – i.e. a sequence of activities) and a sequence of directive sequences with demarcated boundaries (cf. Robinson, 2013). The latter is associated with a work phase because the unfolding of such a sequence is tightly related to a thread of consecutive practical actions composing its baseline (Mazeland, 2019). In other words, the analysis follows workers' orientations to two levels of overall structural organization – a mid-level (phase) and a higher level (task).

4. Data and methods

The data consist of video recordings collected in two construction sites in Norway (Kraft, 2016).¹ The recordings were made by Tomasz himself who wore an action camera installed on his helmet. A large part of the footage (approx. 185 min) documents coordination of load relocation between different formworks in the construction site. Tomasz is then the one who (un)hooks the load (a slinger) and who communicates with tower crane operators (henceforth CO) via a two-way radio in order to administer load relocation tasks (a signaler). At the verbal level, this communication is mostly one-directional: Tomasz formulates directives, while the CO silently complies by performing the indicated actions.

Workers who give signals to COs are specially trained to do this kind of work. The training includes both radio and embodied signaling to crane operators, although there is no formal requirement to use specific and standardized wordings. The list of verbal commands recommended by the Norwegian Crane Technology Association (*Kran Teknisk Forening*, KTF) consists of short and simple directives, designed as imperatives or verbless forms (see Appendix A). Some of the commands are particularly recommended in order to avoid miscommunication. For instance, the officially proposed command to cease lowering or hoisting is *Stans* ('Cease') instead of *Stopp* ('Stop') because the latter could be misheard as the Norwegian word *opp* 'up' (cf. KTF, 2018:16, 51).² Apart from the verbal signals, a signaler is trained to communicate the commands non-verbally, using arms, hands and fingers (KTF, 2018:49–50). This ability is required in case of radio break-off and emergencies. However, in the data there are no cases where the signaler makes directives with gestures only.

Fig. 1 is from a usual day in a construction site where crane work is involved. The CO sits in the cabin and relocates various loads (such as reinforcing bars) from one place to another by using the crane's travel units: the jib (a long-travel unit), the trolley (a cross-travel unit) and the hoist with a hook (a vertical-travel unit). In the data Tomasz' main tasks include: 1) recruiting the CO if needed, 2) hooking and unhooking the load, and 3) directing the work of the CO before, during and after load relocation. In practice, this means that Tomasz tells the CO where to (un)load and how to adjust the travel units so as the whole work goes smoothly and without any delays. The task may be one-time (from place A to place B) or cyclic (A-B-A...), depending on the load type and the amount of load units.

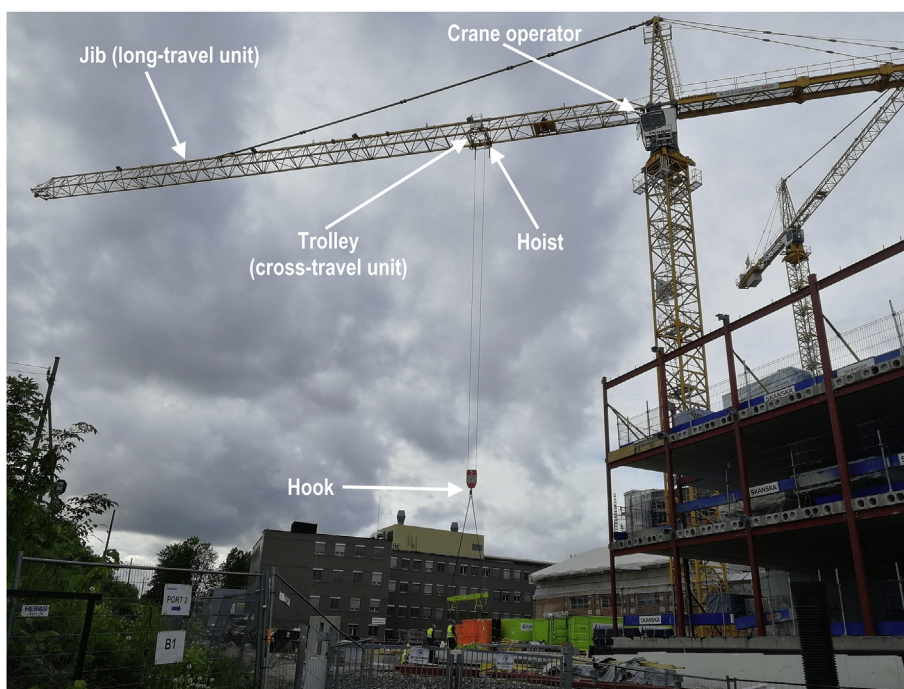


Fig. 1. A crane in a construction site in Norway (photo by P. Urbanik).

¹ The recordings have been collected by permission of the Norwegian Center for Research Data (NSD). The participants received oral and written information about the research project before signing their consent to voluntary participation in the study. They also provided written consent for the video recordings and photos to be used for academic dissemination in anonymized form (see also Kraft, 2016).

² This was confirmed in personal communication with KTF. I thank Trond Fossheim for clarifying the procedures for me.

The study employs Conversation Analysis as a method, focusing primarily on the lexical and grammatical repertoire but taking into account temporal, spatial and embodied resources mobilized in the load relocation process. The transcripts follow CA conventions developed by Jefferson (2004) and multimodal conventions developed by Mondada (2016) with * marking head movement, Δ marking arm movement, and + marking other embodied actions (more details in Appendix B).

5. Analysis

The activity involves a rather limited set of directives with regard to both grammatical formats and lexical variation within each format. Table 1 outlines the forms employed by Tomasz as directives (N = 188).

Table 1

Distribution and lexico-syntactic variation of forms used by Tomasz (N = 188) – from most to least frequent in each category. The overview does not include hybrid formats (e.g. *det er bra senke* 'that is good lower-INF') that make up 6,4% (see the analysis below).

Infinitive 58,5%	Declarative 11,7%	Verbless 11,2%	Imperative 10,1%	Interrogative 2,1%
komme (ned/hit/tilbake) 'to come (down/here/back)'	det er bra høyde 'that is good height'	sakte opp 'slowly up'	senk 'lower'	kan du X? 'can you X?'
senke (ned) 'to lower (down)'	det er bra 'that is good'	løpekatt inn/ut 'trolley in/out'	sving 'turn'	
heise (opp) 'to hoist (up)'		men først den 'but first this'	vent 'wait'	
vente 'to wait'		en meter ned 'one meter down'	heis 'hoist'	
lifte/løfte 'to lift'		litt inn 'a bit in'		
legge (ned) 'to lay (down)'		maksimum inn 'maximum in'		
kjøre inn/ut 'to drive (in/out)'		åkej opp 'okay up'		
fortsette (ned) 'to continue (down)'				
holde 'to keep'				
svinge 'to turn'				

The predominant form is the infinitive which Tomasz normally uses in other settings, too.³ Although bare infinitives can be employed in Norwegian in certain situations (see Johannessen, 2016), they are unidiomatic in the context of load relocation where the imperative is the unmarked form (cf. Appendix A). In Tomasz' repertoire, by contrast, imperatives belong to rather infrequently selected formats. Moreover, apart from the syntactic variation which also includes interrogative, declarative and verbless constructions, we find notable lexical variation, especially in the group of infinitive directives. As we shall see, although the forms are not all idiomatic in Norwegian, Tomasz uses them in a systematic way relative to the various activity phases and other contextual characteristics. We will now go on to see how they are manifested in the various stages of the task performance.

In the data, load relocation tasks are organized according to three superordinate work stages. In the first stage, the construction worker initiates the relocation process by recruiting the CO to move a load from one place to another. In the second stage, he coordinates crane work and load relocation. In the third stage, he marks the end of the task and initiates the next task (circuit) or completes the whole project. This section describes each stage by focusing on distinct work phases that constitute the process of load relocation and carry diverse interactional, material and spatio-temporal properties.

³ In most cases, infinitive forms in Norwegian are made by adding the infinitive suffix *-e* to the stem of a verb. An imperative construction, on the other hand, normally equals the stem of a verb. Second language learners of Norwegian are taught that in order to form imperatives they usually need to cut off the suffix if a polysyllabic verb lexeme ends with *-e*.

5.1. Initiation

In this stage, the construction worker recruits the CO to relocate the load. Sometimes he also recruits another worker (slinger) from a different place at the construction site to attach the load that is to be transferred to the place where he is working. In the data, he organizes the opening sequence in two different ways, using two diverse grammatical formats of directives. Extract 1 presents a situation where he initiates a task with a directive in the infinitive.

Extract 1 (0765)

```

01      + (4.8)      * (1.1)  * (0.3) *
    tomasz  +>>walks fwd----->
    tomasz                *raises%*lowers*
    fig                        %Fig. 2a
} (7.1)

02      (0.3) * (0.6)+
    ----->+
           *raises-->
}

03 Tomasz: %anton komme ↑me:g på høyre.
           NAME come-INF me on right
           Anton come (to) me on the right.
    fig      %Fig. 2b

04      (0.2)* (1.9) Δ(0.9)*
    ----->*keeps up----->*
           Δraises & keeps up-->
} (3.0)

05 Anton: *jeg koΔmmer.
           I come-PRS
           I am coming.
    tomasz  *lowers & turns right---->
    tomasz  ----->Δ

```



Fig. 2a



Fig. 2b

Before uttering the directive, Tomasz raises his head twice (Fig. 2a and b), checking whether the CO is available, which is what he does each time right before initiating a task. Then, he summons the crane operator by an address term and immediately produces the directive. The fact that he does not establish contact by a separate summons-answer sequence, shows that he treats the CO as available and ready to provide service (cf. Lerner 2003). Furthermore, the unmodulated form of the directive does not orient to contingencies and thus presents the directive as legitimate and unproblematic.

In Extract 2, the structural organization of the opening sequence reveals different epistemic and deontic orientations.

Extract 2 (0770)

- 01 Tomasz: *raises---->
%hallå mads.
hello NAME
Hello Mads.
fig %Fig. 3
- 02 (0.4)
- 03 du er på krAnA:?
you be.PRS on crane-DEF
You are on the crane?
- 04 (0.5)*(0.6) * (3.4)
---->*lowers* } (4.5)
- 05 Mads: >hallå hallå¿<
Hello hello¿
- 06 +(1.1)+(0.7)
+turns+walks fwd-->6.13 } (1.8)
- 07 Tomasz: kan du svinge på bakside?
can.PRS you turn-INF to rear.side
Can you turn to the rear side?
- 08 (0.4)
- 09 på dekket?
on deck-DEF
On the deck?
- 10 (0.7)
- 11 jeg skal løfte en paket.
I will.PRSlift-INF ART package.
I am going to lift a package.
- 12 (0.3)
- 13 e armering.+
reinforcement
Reinforcing bars.
----->+
- 14 (0.3)Δ(0.1)
Δpoints--> } (0.4)
- 15 derΔ på *dekkebord.
there on table.formwork
There on table formwork.
-->Δ
*raises----->



Fig. 3

Tomasz begins with a summons-answer pre-sequence to first check whether the CO is available (Schegloff, 1968, 2002; Lerner, 2003). Through the pre-sequence he reveals two epistemic orientations: 1) that he has knowledge about which of the COs is (supposed to be) on the radio, which he marks with the address term directly following the greeting; 2) that he has no certainty about whether this particular CO is on the crane at that moment, which is why he designs his second TCU (line 03) as a question about presence (formatted declaratively). Only after receiving the CO's response does he produce a directive, formulating it as a *Can you*-interrogative (line 07) and complementing it with an account (lines 11, 13, 15) that explains the whole task. This format presents the service as contingent on the CO's availability: Although the CO is on the crane, it is not self-evident that he can do the task. Tomasz displays that the task is not a part of their on-going joint activity and that he enlists the CO to assist him in this task (Zinken and Ogiermann, 2013).

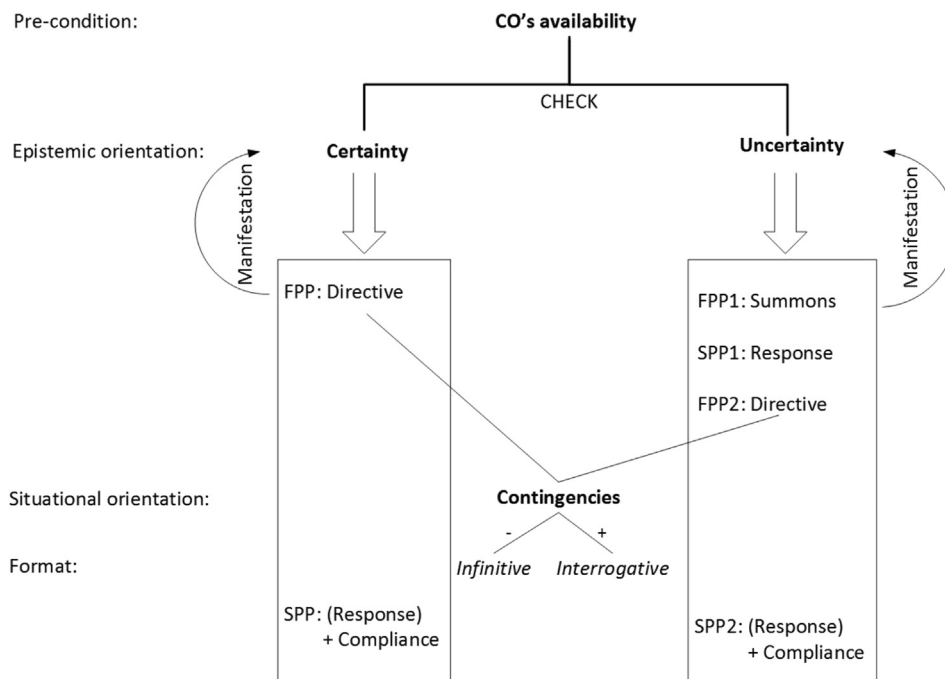


Fig. 4. Variation in the structural and grammatical organization of initiation phase.

In the two extracts the selection of one or another syntactic design reveals Tomasz' different deontic orientations to the task and the role of the CO. Importantly, by virtue of his professional status, Tomasz is generally entitled to use the crane service whenever he needs it. However, because he is not the only signaler who can ask for such support in the construction site, his access to this service depends on the CO's availability at a given point. While producing the infinitive, Tomasz marks a presumption of availability and treats the task as the CO's duty, displaying high entitlement to expect compliance. The interrogative displays that the CO's readiness to do the work is not taken for granted. As a result, Tomasz enlists the CO to assist in the task in the face of some potential contingencies (such as the CO's possible engagement in another task). These findings resemble those reported by Zinken and Ogiermann (2013) in their study on imperatives and second-person polar questions in Polish and English. The difference is that the work of imperatives (i.e. introducing a task as belonging to the recipient's duties) is in our case done by infinitives. *Can you*-interrogatives are, in turn, applied in their base environment (Sacks, 1992/1995:9), i.e. when the speaker recognizes obstacles that threaten compliance and introduces a task as contingent on the recipient's decision (cf. Urbanik and Svennevig 2019 on interrogatives in Norwegian). Fig. 4 presents a scheme of grammatical and sequential variation in the initiation phase, as identified in the data.

Some of the features observed here seem to be characteristic of and specific to phase openings in the data. Verbal initiations are always preceded by a head raise (see Figs. 2a, b and 3), being the first step to check the CO's availability. Furthermore, this is the only phase where Tomasz exclusively uses interrogative directives and adds accounts to them in order to warrant the task that is not introduced as a joint project but as an individual initiative (cf. Streeck, 2017). Finally, it is here that COs tend to provide verbal responses (also to directives), which does not happen in the subsequent sequences of relocation tasks (with some exceptions in the closing phase). These local features also reveal orientations to higher organizational structures of what is planned. By way of constituting the opening sequence, directives introduce a longer joint activity. The logic behind this introduction is that compliance with the opening directive, although satisfying the expectations

at the phase level, does not meet the goal at the task level. Consequently, the directive automatically projects the next steps of load relocation process and an acceptance response commits the CO to co-participation in the whole task.

5.2. Coordination

In the coordination stage, the construction worker controls and guides the process of load relocation from place A to place B. This reveals different orientations that organize and compose larger sequential chunks (phases). Tomasz marks these orientations through embodied and linguistic resources. First, he needs to adjust the crane, then he has to attach the load and after that, he administers its relocation. Below I describe each phase type in this stage. Throughout the analysis section, I mainly follow the task initiated in Extract 2 and labelled (0770). Extracts with different labels are taken from other tasks in the data and are used to exemplify additional observations and a potential deviant case.

5.2.1. High-level crane adjustment

The crane is adjusted at the beginning and at the end of the coordination stage. In order to attach or detach the load, the construction worker first needs to direct the CO to the place where the load lies or is to be laid down. In order to do that, he coordinates the positioning of the jib (long-travel adjustment), the trolley (horizontal adjustment) and the hook (vertical adjustment). Extract 3 exemplifies this phase.

Extract 3 (0770)

```

16      ((37.5 seconds omitted))

17      +(19.1)      +*(1.3) *(0.4) *
      +unties rods+
              *raises*lowers*

18      +(13.3)      +*(0.8) Δ(1.1)
      +unties rods+
              *raises----->
              Δholds arm up-->
  } (36)

19 Tomasz: %å løpe*katt ut.
      and trolley out
      And trolley out.
      ----->*lowers---->
      fig %Fig. 5a

20      (0.5)* (0.9)Δ (0.4)Δ(1.3)
      ---->*
      ----->ΔlowersΔ

21      *(1.4)          *Δ(2.0) Δ
      *turns and raises*
              ΔstretchesΔ
  } (9.2)

22      %+(2.7)
      +holds hook-->
      fig %Fig. 5b

23 Tomasz: >det er brå høyde.<
      it be.PRS good height
      That is good height.

```



Fig. 5a

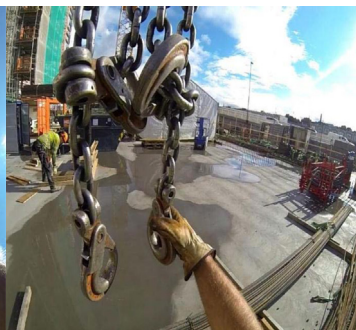


Fig. 5b

Before Tomasz utters the first directive, he regularly monitors the movement of the crane while doing other things (e.g. preparing the load for travel by untying chains around the rods). Repeated head raising (line 17 and 18) preceding verbal commands and accompanied by arm raising is typical of this phase and is tightly related to the spatio-temporal constraints of this contextual configuration. Here, the spatial distance between Tomasz and the jib is relatively large while the control of crane travel requires good timing so that the CO hits the target. When Tomasz utters the verbless directive *å løpekatt ut* ('and trolley out') in line 19, he in fact marks two actions he expects the CO to perform: to cease the long travel (a directive for desistance) and to begin the cross travel (a directive for action) that normally is accompanied by the vertical travel (lowering of the hook). In other words, he indicates transition between the movements in this particular phase. The next directive in line 23 is also two-way. When the hook reaches the optimal height, Tomasz marks the cessation of the travel on the one hand and the transition to the next phase on the other. Here he uses the directive *det er bra høyde* ('that is good height') to indicate the optimal position of the hook. Fig. 6 illustrates the schematic sequential organization of directives in this phase.

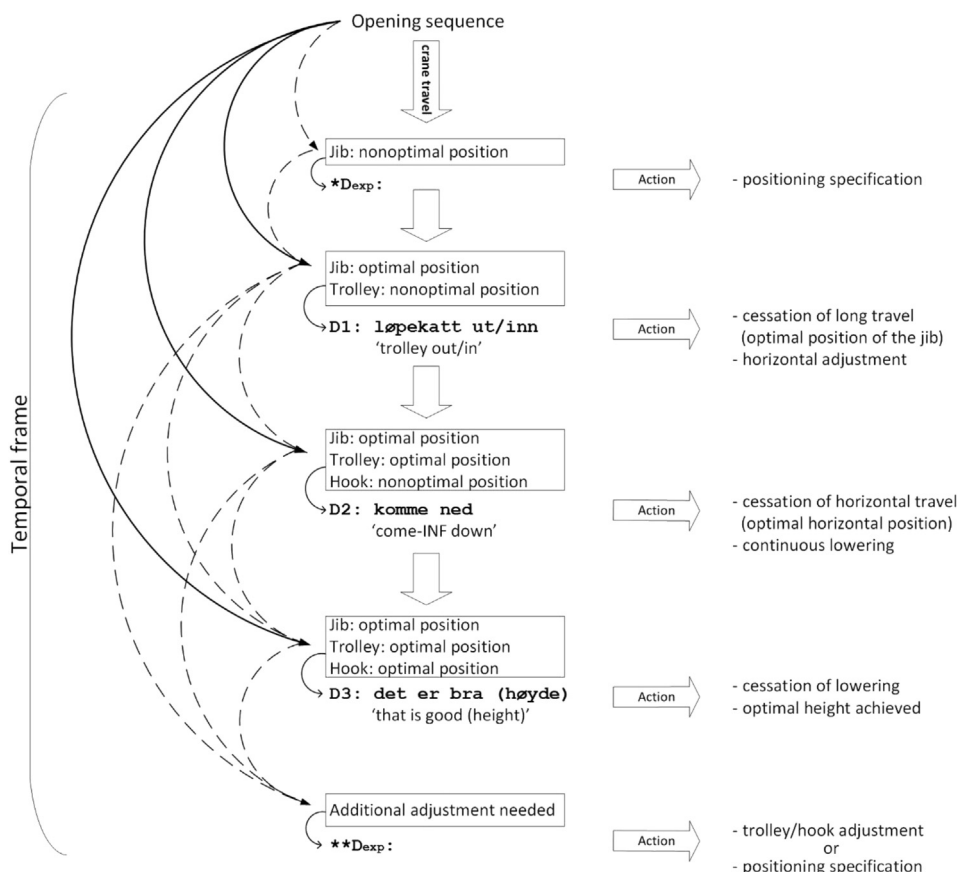


Fig. 6. Structural unfolding of the adjustment sequence. * denotes potential directive pre-expansion, while ** denotes potential directive post-expansion. – means possible succession.

A prototypical course of crane travel consists of three stages that directives coordinate, responding to the positions of crane travel units. Thus, after the initiation phase, as soon as the jib reaches the right position, the first directive ceases the long travel and initiates the horizontal travel. The second directive ceases the horizontal travel and initiates the vertical travel. Finally, the third directive ceases the vertical travel, marking the optimal position of the hook and transition to the next phase (load attachment). However, this three-directive string can be, and often is, reduced when the CO manages to perfectly synchronize the travel of more than one unit, which makes a particular directive next needless. This happens, for instance, when the CO simultaneously adjusts the jib and the trolley or the trolley and the hook (cf. Extract 3). Moreover, depending on the local circumstances, the whole sequence can be pre-expanded with a directive specifying the direction of travel or load destination (*Dexp in Fig. 6). It can also be post-expanded with directives additionally adjusting the trolley and the hook if the previous coordination sequence turned out to be inexact (**Dexp in Fig. 6).

5.2.2. Load attachment

In this phase, Tomasz continues adjusting the hook at a lower level in order to attach the load. Importantly, he now operates within different spatio-temporal constraints, which he orients to linguistically and bodily. Extract 4 demonstrates how these orientations are manifested.

Extract 4 (0770)

24	(0.4)+ (1.2) + (0.5) ---->+hooks rods+	}	(2.1)
25	Tomasz: lifte li:tt, lift-INF a.little Lift a little,		
26	(1.5) Δ(0.9) Δ+(2.5) + ΔstretchesΔ +grasps chains+	}	(6.2)
27	*(1.3) * *turns right & back*	}	
28	Tomasz: åkej vent_ okay wait.IMP Okay wait_		
29	Δ(0.4) Δ+(0.4) + (1.8) ΔstretchesΔ +grasps chains+walks fwd	}	(29.5)
30	+(11.3) +(6.5) +(7.6) +ties rods+turns & walks fwd+ties rods	}	
31	+(1.5) +walks fwd-->	}	
32	Tomasz: >senke ned < lower-INF down Lower down_		
33	(0.5)+ Δ(0.6) Δ+(3.4) + (0.7) ---->+ ΔstretchesΔ +pulls hook+hooks chain	}	(15.6)
34	+(0.7) Δ(0.5) Δ+(0.9) +(1.3) +walks fwd---->+bends down+unhooks rod ΔstretchesΔ	}	
35	+(1.6) +Δ(0.4) Δ+(0.8) +walks fwd+ ΔstretchesΔ +hooks chain	}	
36	+(1.9) +(2.3) +straightens up+walks fwd-->>	}	

Directives in this phase seem specifically designed to coordinate the CO's work in narrower space. This is because the spatio-material configuration of the task has now changed from distal to proximal. The direct consequence of this is that arm raising and vertical head movements are absent from this setting, as they do not serve the local purposes. What Tomasz focuses on is the exact position of the hook in a closer relation to the load. Therefore, directives indicating vertical adjustment, such as *lifte/løfte/heise* ('lift')⁴ and *senke* ('lower'), are often additionally modified with the adverb *litt* ('a little'), as in line 25. In fact, 82% of all verbs followed by the adverb ($n = 33$) belong to the attachment/detachment phase. The use of the modifier serves two main aims: 1) it indicates that the CO is expected to move the hook just to an indeterminate degree (in contrast to continuous movements); 2) it marks incompleteness of Tomasz' on-going work and a need for further adjustment. However, the first function normally signals that the vertical movement is temporally limited and monitored by Tomasz so that the CO does not have to make an independent assessment of how long it should be (cf. Mondada, 2014). This results from the sequential order in which directives mark out the temporal frames of the indicated action – the first directive initiates the movement (line 25), while the next marks its end (line 28) or continuation.

⁴ The Norwegian word for the infinitive 'to lift' is 'å løfte'. Tomasz mainly uses 'lifte' as the infinitive directive.

The design of the latter directive (including its turn-compositional features and the semantics of the action verb used) is consequential for the work progress and the CO's spatio-temporal orientation. In the extract above, the directive is formed in the imperative prefaced with *âkej* ('okay'). The presence of the preface explicitly marks attendance to what was projected in the previous directive and closes down the indicated action, projecting transition to a new one (Beach, 1995). In this particular situation, however, the verb *vent* ('wait') aims at suspending the vertical movement. This form was used whenever the action of attaching the load was structurally complex. In the extract above, Tomasz has already hooked long rods in the middle of their length (line 24), but he also has to tie their ends with chains and attach the chains to the hook so that the load is stable during relocation. This needs work that consists of several sub-phases. Thus, the imperative form marks that only a part of a key task is done and some more attachment work yet needs to be done, which projects longer waiting time for the CO. The infinitive format *vente* ('to wait') or *vente litt* ('to wait a little') projects, on the other hand, shorter pauses and a need for smaller adjustments in less complex attachment tasks.

The temporal frame marked by two directives (the first one indicating movement and often modified with the adverb *litt* and the next directive) during load attachment/detachment can be organized in different ways, depending on the local circumstances. In Extract 5 taken from a different task sequence, what comes after the modified directive (line 14) is the infinitive directive *komme ned* ('come down') prefaced with an assessment *det er bra* ('that is good') in line 16.

Extract 5 (0515-e4-02)

12	Tomasz: °senke litt ° lower-INF a.little <i>Lower a little</i>	
13	(12.3) +(4.4) +holds the upper part of rebar-->	} (16.7)
14	Tomasz: senke litt daniel, lower-INF a.little NAME <i>Lower a little Daniel,</i>	
15	(4.8)	
16	Tomasz: >det er bra komme ned,< it be.PRS good come-INF down <i>That is good come down,</i>	
17	(3.8) +(21.3) + ----->+shakes rebar+	} (25.1)
18	Tomasz: (det er) bra. vente, it be.PRS good wait-INF <i>(That is) good. Wait,</i>	

In this sequence the meaning of *det er bra* ('that is good') is specified by the meaning of the turn construction unit (TCU) that comes next. In line 16, *komme ned* ('to come down') indicates that the vertical movement should continue, which means that the trajectory of the hook is optimal. Yet, in the next turn the directive that consists of (*det er*) *bra* ('that is good') followed by *vente* ('to wait') marks the optimal height of the hook and indicates the cessation of movement and a need for further adjustment. This difference demonstrates a crucial mechanism of meaning making that consists in the dynamic diversification of TCUs' compositional arrangement. It reveals how Tomasz, by means of a few verbs and conventionalized phrases, manages to direct the CO and obtain precision through linguistic approximation. Thus, for instance, the core meaning of *det er bra* (*høyde*) 'that is good (height)' denotes optimality. When the construction stands alone, it becomes a directive for desistance (cessation of movement). When it is followed by a verb indicating motion (e.g. *komme ned* 'to come down', *fortsette* 'to continue'), it marks the optimal trajectory of the hook. However, when it is followed by the verb *vente* 'to wait', the directive marks a temporary cessation of movement due to further adjustment work needed.

Fig. 7 presents three possible nexts in response to load travel that follows an adjustment directive. They mark out the temporal frame of vertical movement and carry distinct actions.

The worker's orientation to the activity level of structural organization in this phase is manifested through the designs of directive turns that respond to the proximal constraints in the spatio-material configuration. Within these constraints, directives serve to temporally manage the local adjustment of the crane. Grammatical variation results from local assessments made by Tomasz and marks situated details that he makes relevant for the CO.

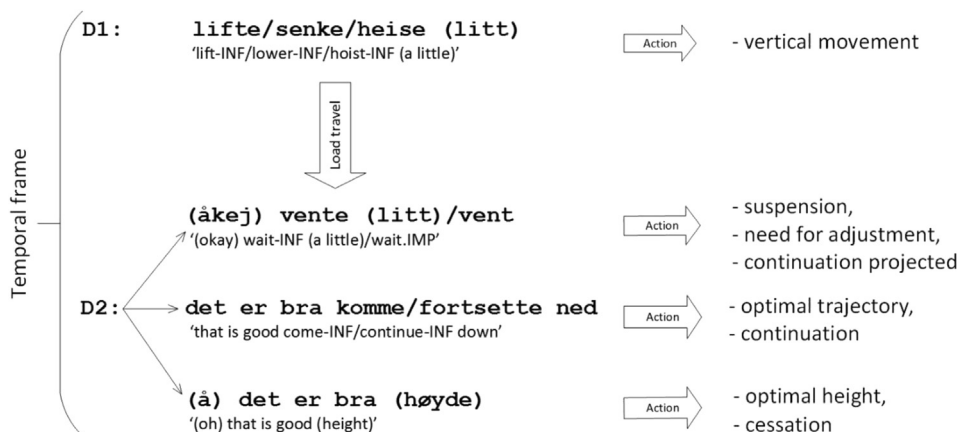


Fig. 7. Grammatical and pragmatic variation of a directive next during the process of adjustment in the temporal frame of load movement.

5.2.3. Relocation

In the last phase of the coordination stage, Tomasz directs the relocation of the load from one place to the other by telling the CO when to start hoisting/lowering and where to travel with the load. Extract 6 exemplifies this phase.

Extract 6 (0770)

```

37 Tomasz: heise opp,
           hoist-INF up
           Hoist up,

38         (1.3)+(1.5)+ (8.5) +(1.9)
           ---->+turns+         +walks fwd

39         +(5.2)             +Δ(0.4) Δ(1.5) Δ
           +holds down load+
                               Δkeeps upΔlowersΔ

40         *(0.6)             *Δ(0.5)
           *turns right*
                               Δraises-->

41 Tomasz: denΔ pAket  ligge::+ circa
           that package lie-INF about
           This package lie about
           -->Δpoints fwd----->
                               +walks fwd->

42         (0.6)

43 Tomasz: på miΔkten deΔkket.
           on middle deck-DEF
           in the middle of the deck.
           ---->Δlowers-Δ

44         (1.7) *(0.8) *(10.4)+*(1.6) *(0.4) *
           *raises*             *raises*lowers*
           ----->+

45 Tomasz: +>komme ned_<
           come-INF down
           Come down_
           +walks fwd-->
    
```

Annotations in the original image:

- A bracket on the right side of lines 38-40 is labeled (21.4).
- A bracket on the right side of lines 44-45 is labeled (14.9).

The first directive (*heise opp* 'to hoist up' in line 37) Tomasz uses in this phase marks continuous hoisting without projecting any cessation. This particle verb was consistently selected to indicate that the attachment (or detachment) process was

over and the relocation of the load could begin, thus announcing phase transition. The directive *komme ned* ('to come down') in line 45, which is not an idiomatic phrase in Norwegian for this type of context,⁵ is, on the other hand, used to announce that the load has reached the optimal position during the long travel. The function of this directive is different from the similar one in the previous phase in that it marks a change in crane travel (from long-travel and/or horizontal to vertical), projecting continuous lowering (contrary to the infinitive *senke* 'to lower' which was never used in this phase).

The lexico-semantic difference in the use of action verbs is particularly striking when comparing this work phase with the previous one. A closer look at the differences between the phases but also at the use of variant directives in this phase reveals fundamentally different orientations. The verbs *heise opp* (alternatively *lifte opp* 'to hoist up') and *komme ned* ('to come down') were conventionally used by Tomasz to denote continuous movements. Now, since the relocation phase consists of such movements, it has become a base environment for these verbs. Importantly, they mark continuous hoisting and lowering as contingent on the CO's control, as the whole relocation process is within his domain of action. By contrast, the verbs *lifte/løfte/heise* ('to lift') and *senke* ('to lower') often modified with *litt* ('a little') in the previous phase indicated and projected actions contingent on the signaler's control and responsibility. This was because the local adjustment required a degree of precision that was beyond the CO's control and had to be performed by the signaler. The lexical change is accompanied by a compositional change. Directives for relocation lack the modifier *litt* ('a little'), which results from the shift in the spatio-material configuration of coordination work that now again is done from distance and is not within Tomasz' control.

To exemplify the claim that the lexico-semantic change in this phase reflects the change in the scope of control and responsibility, we will now look at one of two similar sequences from the data where a variant directive is used in this phase, namely *lifte* ('to lift') instead of the particle verb *heise/lifte opp* ('to lift/hoist up'). In Extract 7, Tomasz attaches the hook to a load on slings. Because the whole package is not stable, he must first make sure that it is safe to relocate it.

Extract 7 (0519-e7-01)

01	+ (0.9)	+ (1.0)	+ (1.0)		}	(3.8)
	+holds hook+	hooks load+	holds hook			
02	+ (0.9)	+			}	(3.8)
	+step back+					
03	Tomasz: lifte _ǃ					
	lift-INF					
	Lift _ǃ					
04	(4.7)	+ (1.1)	+ (0.2)	+ (0.8)	}	(9.2)
	+holds load+	++++	+.....			
05	%+ (0.4)	+ (0.5)	+ (1.5)		}	(9.2)
	+strikes sling+	+++++++	+holds load---			
fig	%Fig. 8a					
06	Tomasz: li:fte					
	lift-INF					
	Lift ₋					
07	(1.0)	%+ (0.5)	+		}	(1.5)
	----->	++++	+			
fig	%Fig. 8b					



Fig. 8a

Fig. 8b

⁵ The idiomatic imperative verbs used to indicate load lowering are rather *senk*, *lår* or *vinsj ned* (see also Appendix A).

The directive that initiates the relocation phase (line 03) is uttered with a slightly rising final contour while Tomasz observes the load. Then he strikes the sling to tighten it around the pile (see Fig. 8a) and holds the pile until it reaches a certain height (Fig. 8b), uttering the second directive. What we thus see is that the attachment phase where actions are indicated as contingent on Tomasz' control is prolonged and overlaps with the relocation phase. Although this is not unusual in terms of embodied actions, it deviates from the predominant pattern of directive use. Here, Tomasz does not seem to leave the control of and the responsibility for hoisting to the CO, what he otherwise does by using particle verbs. Instead, he marks that he is still coordinating the hoisting, controlling and taking responsibility for its initial stage (cf. the adjustment of the crane units at the local level in 5.2.2). This explains the prosodic pattern of the first directive that marks conditional hoisting and projects a potential cessation in case something wrong happens.

In this phase, embodied resources again become salient, either as orientation means (head raising) or signals to the CO (pointing, cf. line 41 in Extract 6). In the latter case, they are accompanied by additional directives specifying the direction of travel and the load's final destination (see Extract 6, lines 41–43). The crane adjustment sequence or some of its elements may be a part of this phase when Tomasz is the one who detaches the load. Otherwise, when the load is detached by a different slinger at a different place, Tomasz may mark whether the on-going task is a part of a cycle or whether it ends after the detachment. In order to either specify the travel direction or get the CO to return, he constantly uses the imperative directive *sving* ('turn'), as in Extract 8, line 03.

Extract 8 (0782)

```
01      det er  +bra høyde, +
        it be.PRS good height
        That is good height,
        +turns right+

02      (0.3)

03 Tomasz: +ΔsvingΔ%  på høyΔre side_Δ
           turn.IMP on right side
           Turn to the right_
           +walks fwd----->>
           ΔliftsΔpoints fwdΔ,,,,,,Δ
fig      %Fig. 9
```



Fig. 9

However, in one case (of all 8) presented in Extract 9 Tomasz uses the infinitive form of the same verb, i.e. *svinge* ('to turn'). This raises a question whether this selection is random or whether it reveals different orientations, again pointing towards the meaningful role of forms used outside their base environments as grammatical variants. In Extract 9, Tomasz walks towards the place where the load is to be detached, following the travel of the crane with regular head raising. At one point, he looks upwards raising his arm (Fig. 10) and produces the infinitive directive (line 03).

Extract 9 (0772)

```

01      +Δ(0.4) *(0.3)Δ(0.2)*%(0.8) *(0.5)Δ*
      +>>-walks fwd----->
      Δraises-----Δkeeps up----->Δ
      *raises-----*keeps up*lowers*
      fig                                %Fig. 10
02      (0.7)
      ----->
03 Tomasz: svinge venstre.
      turn-INF left
      Turn left.
      ----->>

```

} (2.9)



Fig 10

The directives from both extracts belong to the same phase, but the contextual configurations and Tomasz' temporal and embodied orientations in these phases differ. In Extract 8, he first changes his position and begins walking forward. The imperative directive is added as an instructive announcement providing information to which the CO did not have epistemic access. This makes the construction as if it was *outside* the progression of the task, as it does not serve to directly coordinate the travel but to inform the CO and get him prepared to travel in the indicated direction. In Extract 9, on the other hand, Tomasz is already on his way to the destination place and before uttering the directive, he checks the position of the jib that is also in movement. In other words, he coordinates the on-going travel of the jib, adjusting it to his own

position. Thus, the directive here is *embedded* in the progression of the task and marks that the crane is not moving in the expected direction, which is typical of local adjustment where directives respond to and correct imprecise positions. Consequently, the infinitive construction displays retrospective temporal orientation which the imperative construction lacks.

Fig. 11 illustrates the schematic organization of the relocation phase.

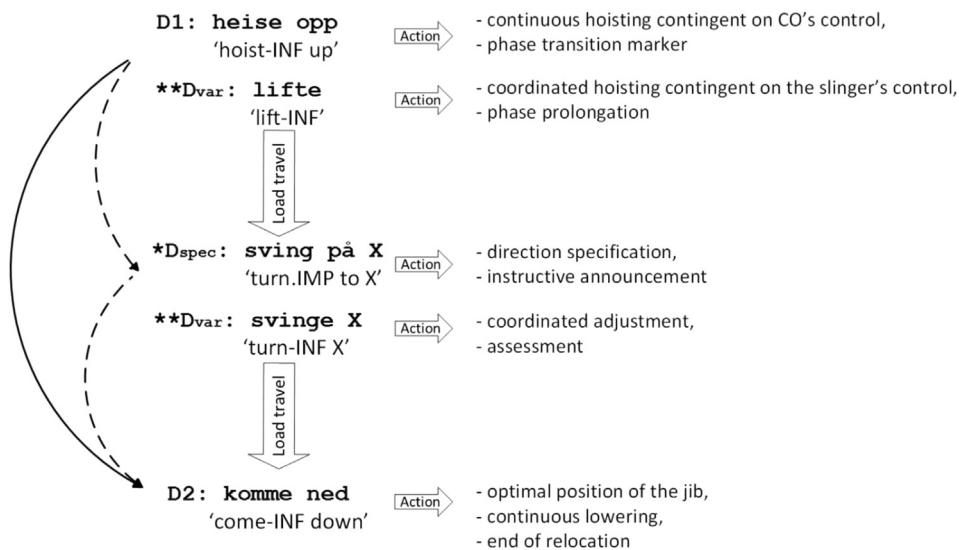


Fig. 11. Structural unfolding of the relocation phase. — means possible succession. *Dspec denotes an optional directive that specifies movement direction, while **Dvar denotes a variant directive form in the actual sequential position.

As demonstrated in this section, our signaler's orientation to the activity level of structural organization in this phase is essentially reflected in the significant lexical and compositional change of directive turns as compared to the previous phase.

5.3. Completion

In the completion stage, Tomasz coordinates the process of load detachment. This normally consists of the local adjustment of the crane units (particularly the trolley and the hook), the final placement and detachment of the load, and further instructions or a closing turn. In other words, completion includes a phase highly similar to the attachment phase although this time with an inverse goal and thus organized slightly differently.

5.3.1. Load detachment and closing

In Extract 10, the load is being continuously lowered to the point where Tomasz can keep hold of it, taking over the responsibility for local coordination. Then he adjusts the load to the desired position by turning it and controlling the crane movements.

Extract 10 (0770)

```

46      (1.8)+ (1.4) * (1.5) * (0.5) * (1.5)      *
      ---->+
           *raises*lowers*turns right*
47      (1.5) * (0.7) * (0.8) * (3.0) * (0.5)
           *raises*lowers*      *raises----->
48      *Δ(0.8)* (4.8)Δ(2.0)      +(4.9)
      *lowers*
      Δkeeps up-->Δholds down load----->
           +walks fwd->
    
```

(25.7)

```

49 Tomasz: %senke litt.
      lower-INF a.little
      Lower a little.
      fig %Fig. 12a
    
```

```

50      (0.9)+ (7.6)Δ+(1.9)      +*(2.0)
      ----->Δ
      ---->+      +walks fwd+holds down load-->
           *turned left----->
    
```

(12.4)

```

51 Tomasz: %↑senk
      lower.IMP
      ↑Lower_
      fig %Fig. 12b
    
```

```

52      (3.6)*(0.5) * (0.8)      * (0.3)
      ---->*lowers*turns left*
53      *(1.1)      * (0.6) * (1.3)      * (1.4)+
      *turns right*      *turns left*
      ----->+
54      Δ (1.2) Δ+(1.2)
      ΔstretchesΔ
           +unhooks chain->
55      +(2.9)      * (0.3)+ (.) *
      +holds chain and walks fwd+
           *turns left*
    
```

(15.2)

```

56 Tomasz: +sakte ↑opp. (.) takk for hjelpe.
      slowly up      thanks for help
      Slowly ↑up. (.) Thanks for help.
      +walks fwd----->
    
```

57 (1.3)

```

58 CO: (bare hyggelig.)
      just nice
      You're welcome.
    
```

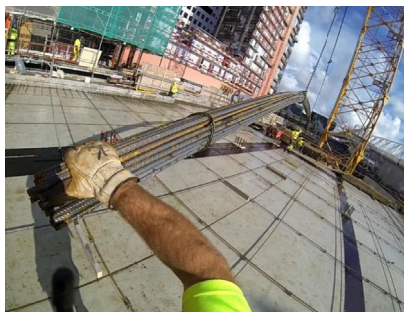


Fig. 12a

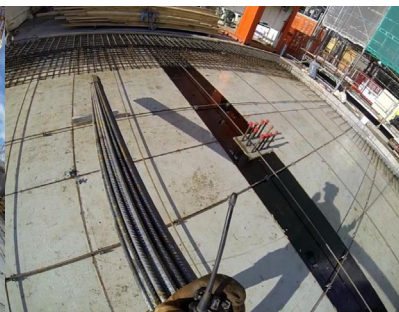


Fig. 12b

The first directive in line 49 marks the end of the physical adjustment (turning the load, see Fig. 12a) and indicates a short vertical movement projecting a need for further adjustment. During the lowering, Tomasz holds the load and inspects whether the trajectory of the movement is right, as the reinforcing bars are to be laid down on pieces of wood. Only after making sure that the position of the load is adjusted does he utter the imperative directive *senk* ('lower') from line 51 (see also Fig. 12b). In the data corpus as a whole, he employs this imperative form almost exclusively to indicate a continuous and terminal vertical movement, thus marking optimal positioning and trajectory as well as projecting the end of the detachment phase and the whole relocation task. Consequently, the format mostly appears as the last directive before detachment (but see below) – either after necessary local adjustment (most of the cases, $n = 7$) or right after the relocation phase, following high-level adjustment when Tomasz does not project any additional coordination at the local level (2 cases).

After the load is detached, Tomasz closes the task by indicating that the hook can be hoisted (line 56). All the directives he employs in the closing phase mark continuous hoisting contingent on the CO's control. They include verb-based and verbless constructions with the adverb *opp* ('up'), i.e. *lifte/heise opp* ('lift/hoist up'), *sakte opp* ('slowly up') or just *opp* ('up'). Their use again demonstrates that the adverb in Tomasz' repertoire plays a central role in not only indicating continuous movement but also in marking a change in the division of responsibility (see 5.2.3). In the extract above, the directive from line 56 appears when Tomasz does not orient to the hook any longer, leaving the control of hoisting to the CO.

When the task is a part of a cycle, a directive in this phase is followed by additional directives regarding the next task sequence (e.g. the CO is told to return in order to relocate more load). Otherwise, Tomasz tends to close the phase by thanking the CO for the help (cf. line 56), which clearly refers to the whole task, not the preceding action, marking thus closing at the highest, suprastructural level (cf. Mazeland, 2019). Fig. 13 presents the schematic organization of directive sequences in the completion stage.

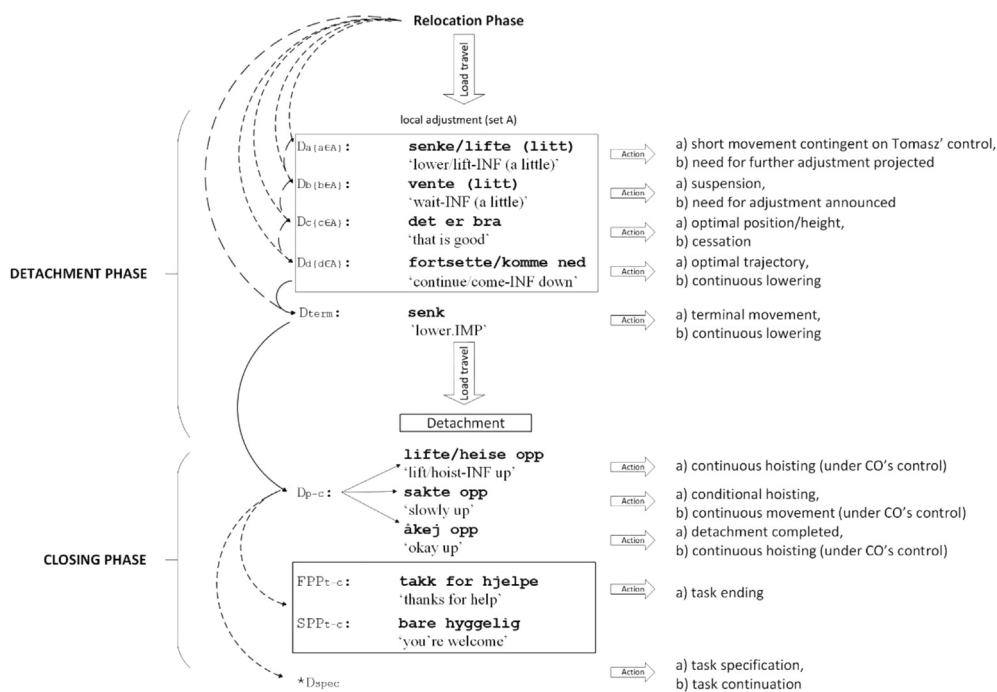


Fig. 13. Structural organization and grammatical variation of directives in the completion stage. — means possible succession. Set A includes directives typical of local adjustment. Dp-c denotes a phase-closing directive, FPPt-c and SPPT-c denote first and second pair part in a task-closing sequence, *Dspec denotes an alternative closing when the load relocation is to be continued.

5.3.2. Potential deviant case

In one case, the imperative *senk* ('lower') is not used in the detachment phase to indicate a terminal movement, thus constituting a potential deviant case. We will now look more closely at the extract in order to find out why the imperative is used outside its base environment.

In Extract 11, Tomasz employs the imperative directive *senk* ('lower') in the attachment phase when he hooks two packages of reinforcing bars. The extract begins after he has attached the first one and instructed the CO to hoist the load. Then, holding his arm up (line 03), he tells the CO to travel to the place where the second package lies.

Extract 11 (0772)

```

Δ>>holds load-->
01 Tomasz: ↑vente:Δ li:tt,
            wait-INF a.little
            Wait a little,
            ----->Δmoves down-->

02          (0.7)      Δ+(1.1)Δ(0.2) Δ(0.3)
            Δholds loadΔ,,,,,ΔraisesΔholds up---->08
            +walks fwd----->06
            } (2.3)

03 Tomasz: anton ↑komme hi:t,
            NAME come-INF here
            Anton come here,

04          (0.7)

05 Tomasz: til andre paket,%
            to second packet
            To the other packet,
            fig %Fig. 14a

06          (0.8)+ (0.2) *(0.6)
            ---->+
            *raises
            } (1.6)

07 Tomasz: *å løpekatt ut.
            and trolley out
            And trolley out.
            *keeps up----->

08          (0.6)Δ(0.3)*(0.8) * (5.7) Δ(1.2)
            ---->Δ Δraises
            ----->*lowers*

09          Δ(2.1) Δ(1.1) Δ(0.2)
            Δholds upΔgrasps & turns loadΔ,,,,,
            } (14.6)

10          Δ(0.5)Δ(0.8) Δ(0.2)
            Δ.....Δgrasps & turns loadΔ,,,,,

11          Δ(0.6)Δ(0.5)
            Δ.....Δholds load--->

12 Tomasz: %↑senk,
            lower.IMP
            Lower,
            ----->>
            fig %Fig. 14b
    
```



Fig. 14a

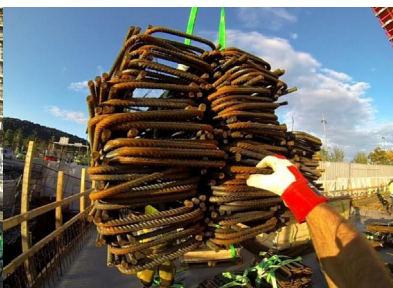


Fig. 14b

The whole attachment phase requires a short travel of the crane that constitutes sub-phases at the local level. After Tomasz has attached the first package, he coordinates its relocation to the place where the second package is to be hooked. This involves directives typical of the initiation of a new task in lines 03–05 (note the infinitive *komme* ‘come’ prefaced with an address term, marking no orientation to contingencies and high entitlement to expect compliance, cf. Extract 1 in 5.1) and of high-level crane adjustment in line 07. When the crane units reach their optimal position, Tomasz produces the imperative directive to indicate the final continuous lowering before attaching the second load. Thus, one possible explanation is that the imperative serves here to finalize the local relocation as a new task. In other words, the form that normally finalizes a whole task sequence marking the last vertical movement seems to be extrapolated to a sub-phase that structurally resembles the organization of a whole load relocation task. Consequently, just as this imperative was used after crane adjustment in the relocation or the detachment phase (cf. Fig. 13) it seems to be employed on similar terms in this case.

6. Conclusions

The study has examined the lexical and grammatical variation of directives addressed to crane operators in different phases of the load relocation process in construction sites. It has shown that the design of directive turns follows the structural order of work, responding to and progressing the sequential unfolding of the activity. By routinized selection of certain lexico-syntactic forms of directives, the Polish signaller marks actions relevant to his local aims, composing sequential chunks that reveal his orientations to work phases. The analysis furthers knowledge about language use and organization of human interaction in the workplace in three aspects.

First, the study has shown how the overall structural organization of relocation tasks is consequential for the design of directive turns. This has required considering the character of the whole activity that shapes the collaborative interaction between the one who operates the crane from above and the one who is assigned to coordinate its work from below. In order to achieve the ultimate aim of the task (relocation), the two workers jointly accomplish minor goals in the course of the activity, such as recruiting the CO, optimally positioning the crane units, attaching the load and so on. It is this collaborative pursuit of partial, structurally embedded goals that shapes the design of directive turns: Each action is indicated at a point that is assessed as and made locally salient for the achievement of a larger milestone in the whole task (cf. Levinson, 1979; Mazeland, 2019; Robinson, 2003). Thus, the use of given formats and the sequential organization of them depend on the unfolding of the activity and the relevance of action indication, being modified in response to the CO's actions and local conditions within their spatio-temporal constraints. Consequently, the signaller's orientation to work phases is marked at a structurally higher level, in a thread of directives demarcated by the nearest goal that they cumulatively serve to reach (cf. Mazeland, 2019).

The basis for this “supra-sequential coherence” (Robinson, 2013) is naturally the general work order that implements shared institutional and experiential norms of how things are done. This linear structure of events marks constraints as to what goal needs to be achieved first so that the next can be obtained, being a consecutive step towards the achievement of the overarching goal. Although the actual unfolding of work is decisive in designing directive turns, it is the overall structure of phase routine that delimits the repertoire of forms (cf. e.g. opening sequences with their formal and structural alternatives). A crucial variable related to this level of organization that turns out to underlie the lexico-syntactic variation as well as the relevance of embodiment in the data is the spatial arrangement of local actions. Distinct conventions have been established to make relevant proximal and distal coordination in order to regulate the temporality of work (short vs. continuous movements) and modulate the division of control and responsibility between the slinger and the CO.

Yet, linearity is not the only constraint put on directives. Another one, although related to the former, is the structural similarity of events and actions in the course of activity. Sequences representing certain trajectories of actions were partially or fully replicable to similarly built events. For instance, directives for crane adjustment appeared whenever crane adjustment was needed, whether this was before load attachment, by the end of load relocation or elsewhere. Similarly, directives for continuous movements appeared whenever such movements could be made relevant. This redistribution of directive threads and their structural embeddedness partly explain why workers rely on relatively few resources they can routinely apply to recurrent and organizationally analogous events, which amply recalls script/frame theories (Fillmore, 1976; Schank and Abelson, 1977).

Second, the study has demonstrated that the few directive formats from Tomasz' repertoire carry numerous functions depending on the phase they appear in, their sequential position and their turn-internal composition. In other words, their “interpretive valence” (Drew and Heritage, 1992) is determined by configurations deriving from different levels of structural organization. While some patterns in this interplay are flexible and mobile, others are fixed, which is why certain formats are conventionally assigned to certain phases and do not normally appear in other phases. For instance, *Can you*-interrogatives appeared only in the initiation phase because, as it seems, they emerge when the speaker's deontic authority to require compliance and epistemic access to the co-worker's availability are limited. This is normally the case when the signaller and the CO are not yet engaged in joint action (cf. Zinken and Ogiemann, 2013).

Distinct directive formats not only serve to indicate different actions (e.g. short vs. continuous movements) but also to differentiate the progressivity of actions (e.g. cessation vs. continuation). Moreover, with exception of the ones formatted as being outside the progression of the task, directives operate in a two-way system in the sense that they both act on the previously indicated action and project another action. At the same time, two two-way directives following each other in a sequence mark out the temporal frame of the action indicated in the former and delimited in time by the latter. Now, depending

on the semantic design of a turn and its sequential position, a directive can also mark reasons for its relevance and projections of task progressivity by revealing why it appeared (e.g. the crane's optimal position) and what it implies as forthcoming (e.g. need for further adjustment, structurally complex task etc.). Fig. 15 summarizes the results for each relocation phase.

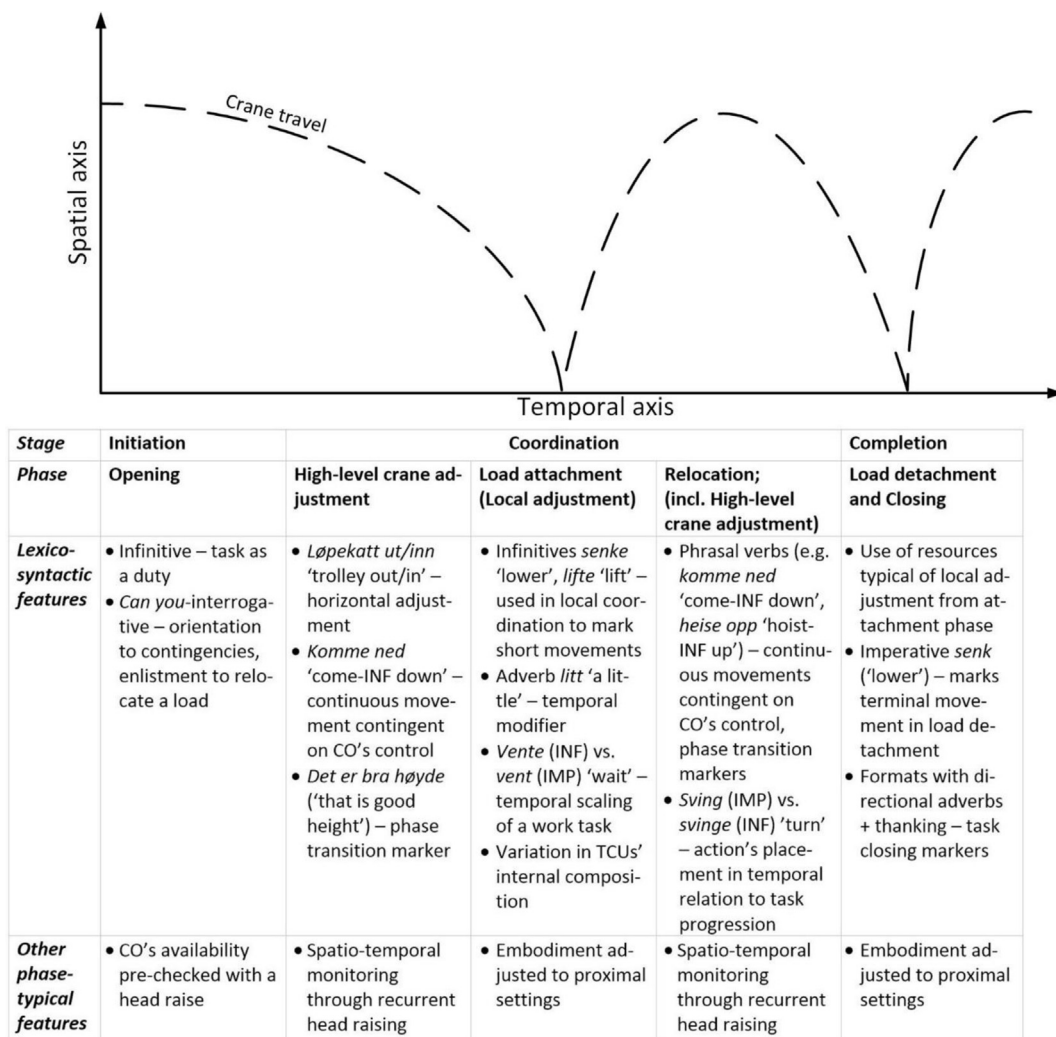


Fig. 15. Linguistic, embodied and contextual features of work phases in a relocation task.

Third, the present study has outlined the features of Tomasz’ L2 Norwegian in interactions with COs, showing that his employment of directives follows certain principles, making up a system. In this system, less frequent and thus more marked forms in given phases seem to provide additional meanings through which certain orientations are made locally relevant. To express directives and mark meaningful details, Tomasz makes use of standard (idiomatic) and non-standard forms. He employs *Can you*-interrogatives in their base environments, i.e. when orienting to contingencies. He also consistently uses modifiers in the phases they structurally belong to. When the crane movement is to be continuous, which in fact means a shift in the scope of control and responsibility, he usually changes the verb lexeme and always adds an adverb of direction. His predominant use of infinitives suggests that they are applied as unidiomatic substitutes for imperatives that would most probably be used in similar environments by Norwegian workers. However, he regularly marks more complex aspectual meanings by employing some verbs in the imperative as variants. These signify a continuous, terminal movement in the whole task (the imperative *senk* ‘lower’), longer duration of the following action due to its complexity (the imperative *vent* ‘wait’) and the externality of the indicated action with regard to here-and-now coordination (the imperative *sving* ‘turn’). These patterns provide an insight into the fundamental principles of linguistic navigation that underlie L2 acquisition and use. They demonstrate that the lexico-syntactic variation in our Polish worker’s L2 Norwegian is far from being random but responds to the structure of work order and his local orientations, and that this variation contributes to making these orientations manifest to his interlocutors.

The study has demonstrated the significant role of the overall structural organization in workplace interaction and in second language use. It has been shown that the mechanisms of turn design draw on configurational defaults created by higher-level structures to which participants orient and which they manifest locally. The conversation-analytic approach is a powerful tool to identify and examine the constitutive rules of these mechanisms and thus the rules of the game in the Wittgensteinian sense by systematically analyzing step-by-step details of interactional sequences and providing a thorough account of linguistic patterns and their sources. Adding a new perspective on the grammar of directives in the workplace through a phase analysis, the study shows that the explanation of lexico-syntactic variation in routine activities requires determining not only what a form does in a sequence but also how it functions in relation to its base activity.

Funding

This work was partly financed by the Research Council of Norway, project number 302219.

Declaration of competing interest

The author declares that there is no conflict of interest.

Acknowledgements

I thank Kamilla Kraft and Jan Svennevig for granting me access to the recordings. My great thanks also go to Jakob Steensig, Jan Svennevig and Jessica Hansen for their comments on drafts of this article and to the two anonymous reviewers. I am also grateful to the Norwegian Crane Association (KranTeknisk Forening) for answering my questions about procedures and practices in communication with crane operators.

Appendix A. Commands as recommended by the Norwegian Crane Technology Association for radio signaling to crane (KTF, 2018)

Command in Norwegian	Official English translation
<i>Hiv/Vinsj opp</i>	Lift load
<i>Lår/Vinsj ned</i>	Lower load
<i>Løpekatt ut</i>	Trolley out
<i>Løpekatt inn</i>	Trolley in
<i>Sving høyre</i>	Swing to the right
<i>Sving venstre</i>	Swing to the left
<i>Stans</i>	Stop movement immediately
<i>Pent/Fint/Rolig</i>	Calm movement
<i>Slakk av</i>	Facilitate disconnection of the hook
<i>Fri krok</i>	Raise up free hook

Appendix B. Transcription conventions

CA transcriptions	
(1.1)	silence in seconds and tenths of a second
↑	sharp change in pitch
?	strongly rising intonation
ˆ	rising intonation
˙	slightly rising intonation
–	flat intonation
˘	falling intonation
°senke°	quieter talk
e:	sound stretching
KRANA	louder sound
<u>der</u>	stress
><	faster talk
(det er)	unclear/uncertain fragment
Multimodal transcriptions	
*	head movement
Δ	arm movement
+	other embodied actions
word	two identical symbols delimit embodied actions
>>	the action begins before the excerpt's beginning

- Mondada, Lorenza, 2014. Requesting immediate action in the surgical operating room: time, embodied resources and praxeological embeddedness. In: Drew, P., Couper-Kuhlen, E. (Eds.), *Requesting in Social Interaction*. John Benjamins, Amsterdam/Philadelphia, pp. 269–302.
- Mondada, Lorenza, 2016. Conventions for multimodal transcription. https://franzoesistik.philhist.unibas.ch/fileadmin/user_upload/franzoesistik/mondada_multimodal_conventions.pdf. (Accessed 16 August 2020).
- Raevaara, Liisa, 2017. Adjusting the design of directives to the activity environment: imperatives in Finnish cooking club interaction. In: Sorjonen, M.-L., Raevaara, L., Couper-Kuhlen, E. (Eds.), *Imperative Turns at Talk: the Design of Directives in Action*. John Benjamins, Amsterdam/Philadelphia, pp. 381–410.
- Robinson, Jeffrey D., 2003. An interactional structure of medical activities during acute visits and its implications for patients' participation. *Health Commun.* 15 (1), 27–59. https://doi.org/10.1207/S15327027HC1501_2.
- Robinson, Jeffrey D., 2013. Overall structural organization. In: Sidnell, J., Stivers, T. (Eds.), *The Handbook of Conversation Analysis*. Wiley Blackwell, Chichester, pp. 257–280.
- Robinson, Jeffrey D., Stivers, Tanya, 2001. Achieving activity transitions in physician-patient encounters: from history taking to physical examination. *Hum. Commun. Res.* 27 (2), 253–298. <https://doi.org/10.1111/j.1468-2958.2001.tb00782.x>.
- Rossi, Giovanni, 2012. Bilateral and unilateral requests: the use of imperatives and mi X? Interrogatives in Italian. *Discourse Process* 49 (5), 426–458. <https://doi.org/10.1080/0163853X.2012.684136>.
- Sacks, Harvey, 1992/1995. *Lectures on Conversation: Volumes I & II*. Blackwell Publishing, Malden.
- Saito, Junko, 2011. Managing confrontational situations: Japanese male superiors' interactional styles in directive discourse in the workplace. *J. Pragmat.* 43, 1689–1706. <https://doi.org/10.1016/j.pragma.2010.11.008>.
- Schank, Roger C., Abelson, Robert P., 1977. *Scripts, Plans, Goals and Understanding: an Inquiry into Human Knowledge Structures*. Lawrence Erlbaum Associates, Hillsdale.
- Schegloff, Emanuel, 1968. Sequencing in conversational openings. *Am. Anthropol.* 70 (6), 1075–1095.
- Schegloff, Emanuel, 2002. Opening sequencing. In: Katz, J.E., Aakus, M.A. (Eds.), *Perpetual Contact: Mobile Communication, Private Talk, Public Performance*. Cambridge University Press, Cambridge, pp. 326–385.
- Schegloff, Emanuel, Sacks, Harvey, 1973. Opening up closings. *Semiotica* 8, 289–327.
- Streeck, Jürgen, 2017. *Self-Making Man: A Day of Action, Life, and Language*. Cambridge University Press, Cambridge.
- Svennevig, Jan, 2018. "What's it called in Norwegian?": acquiring L2 vocabulary items in the workplace. *J. Pragmat.* 126, 68–77. <https://doi.org/10.1016/j.pragma.2017.10.017>.
- Taleghani-Nikazm, Carmen, Huth, Thorsten, 2010. L2 requests: preference structure in talk-in-interaction. *Multilingua* 29, 185–202. <https://doi.org/10.1515/mult.2010.008>.
- Taleghani-Nikazm, Carmen, Drake, Veronika, Golato, Andrea, Betz, Emma, 2020. Mobilizing for the next relevant action: managing progressivity in card game interactions. In: Taleghani-Nikazm, C., Betz, E., Golato, P. (Eds.), *Mobilizing Others: Grammar and Lexis within Larger Activities*. John Benjamins, Amsterdam/Philadelphia, pp. 47–81.
- Urbanik, Paweł, 2020. Getting others to share goods in Polish and Norwegian: material and moral anchors for request conventions. *Intercult. Pragmat.* 17 (2), 177–220. <https://doi.org/10.1515/ip-2020-0009>.
- Urbanik, Paweł, Svennevig, Jan, 2019. Managing contingencies in requests: the role of negation in Norwegian interrogative directives. *J. Pragmat.* 139, 109–125. <https://doi.org/10.1016/j.pragma.2018.10.014>.
- Vine, Bernadette, 2004. *Getting Things Done at Work: the Discourse of Power in Workplace Interaction*. John Benjamins, Amsterdam/Philadelphia.
- Vine, Bernadette, 2009. Directives at work: exploring the contextual complexity of workplace directives. *J. Pragmat.* 41, 1395–1405. <https://doi.org/10.1016/j.pragma.2009.03.001>.
- Wagner, Johannes, 2015. Designing for Language Learning in the Wild: creating social infrastructures for second language learning. In: Cadierno, T., Eskildsen, S.W. (Eds.), *Usage-Based Perspectives on Second Language Learning*. De Gruyter Mouton, Berlin, pp. 75–102. <https://doi.org/10.1515/9783110378528>.
- Weigel, Margaret M., Weigel, Ronald M., 1985. Directive use in a migrant agricultural community: a test of Ervin-tripp's hypotheses. *Lang. Soc.* 14 (1), 63–79. <https://doi.org/10.1017/S0047404500010940>.
- Wittgenstein, Ludwig, 1953/1958. *Philosophical Investigations*. Basil Blackwell, Oxford.
- Zimmerman, Don H., 1992. The interactional organization of calls for emergency assistance. In: Drew, P., Heritage, J. (Eds.), *Talk at Work: Interaction in Institutional Settings*. Cambridge University Press, Cambridge, pp. 418–469.
- Zinken, Jörg, Ogiermann, Eva, 2013. Responsibility and action: invariants and diversity in requests for objects in British English and Polish interaction. *Res. Lang. Soc. Interact.* 46 (3), 256–276. <https://doi.org/10.1080/08351813.2013.810409>.

Paweł Urbanik is a Postdoctoral Researcher at the Center for Multilingualism in Society across the Lifespan (MultiLing) at the University of Oslo. His research focuses on the sequential analysis of phases in institutional settings (police interview, construction site), grammatical variation and configurability in interaction, interplay between gestures and grammar, and directives in Polish and Norwegian. Recent publication: "Getting others to share goods in Polish and Norwegian: Material and moral anchors for request conventions" (*Intercultural Pragmatics*, 2020).