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Other-initiated repair as an indicator of critical communication in ship-to-ship interaction

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Abstract
Communication is an essential part of most joint activities, and effective means to identify and rectify misunderstandings are necessary to reach mutual understandings. In the maritime domain, faulty communication is often a contributing cause to ship accidents, potentially putting human lives, vessels, and the environment at risk. This study explores the use of other-initiated repair in maritime ship-to-ship communication. The purpose is to classify and analyse other-initiated repair and describe the specific practices used to initiate repair and rectify mistakes. Based on an analysis of authentic communication between vessels involved in icebreaker operations, findings indicate that other-initiated repair occurs less frequently in this corpus compared to other corpora of naturally occurring conversations. A possible reason is that radio communication, which is highly structured, has other means to identify communicative errors. More than half of the repair initiations use open requests to identify a trouble turn, and the most common repair solution is a full or partial repeat. Furthermore, maritime radio communication has an inherent slowness due to technical limitations that do not permit simultaneous talk. It is argued this refrains speakers from using long or complex messages, as the listener has no way to indicate trouble until next turn.

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1. Introduction

People make mistakes when communicating with each other and without means to deal with such miscommunication and ways to rectify errors joint activity could easily become an insurmountable task (Albert and de Ruiter, 2018). Weigand (1999, p. 769) defines a number of features of what she calls “the standard case of misunderstanding”. As such, a misunderstanding occurs when the interpreted meaning deviates from the one intended by the speaker and the interlocutor is unaware of this fact. Furthermore, in contrast to a misunderstanding which relates to the ability of the hearer, Weigand (1999) uses the term miscommunication to emphasise the interactive phenomenon including both the speaker and the hearer and their coming to an understanding. Similarly, Healey et al. (2018) stress the interactive nature of communication arguing that miscommunication should not be regarded as noise; on the contrary, miscommunication, or more accurately the means to rectify it, is what gives human communication its flexibility and an ability to respond constructively in unfamiliar situations.

The notion of linguistic repair rests heavily on turn-taking, a concept originally developed by Sacks et al. (1974) which describes the organization of talk. Based on audio recordings of naturally occurring conversations, Sacks et al. (1974) developed a model accounting for (among other things) turn order, turn size and turn-allocation techniques. Without
attempting to offer a complete account of the model, they concluded that: overwhelmingly, only one person speaks at a time; however, during brief periods it is not uncommon for more than one person to speak simultaneously; turn order and turn size are not fixed beforehand; turn-allocation techniques include ways to obtain the next turn, e.g. current speaker selects next speaker by asking a question, or self-selection. Even though there are exceptions, Sidnell (2010) stresses that people generally interact in a way to minimize gaps where no one is talking and overlaps where more than one person is talking at the same time. In ship-to-ship communication, which is the focus of attention in this paper, the role of turn-taking is less prominent mainly because radio communication often (but not exclusively) only involves two parties and overlap is not possible, thereby creating a natural order where the speakers take alternating turns. Still, efficient turn-yielding at sea can be facilitated through the use of lexical devices denoting performative power, e.g. the word “over” (Bocanegra-Valle, 2011; Pritchard and Kalogjera, 2000), by clearly posing a question which requires an answer, or by using closed-loop communication (Boström, 2020). The latter is a circular communication mode where messages are repeated with the aim to avoid misunderstandings. Instead of simply acknowledging a message by replying “ok”, a reply where all or part of the original message is repeated provides a confirmation on whether the received message has been interpreted as intended. At sea, closed-loop communication is for example often used during routine communication between vessels and monitoring stations within a congested traffic area (Brödje et al., 2013) and has potential to increase the safety of maritime operations (Grech et al., 2008).

The concept of repair addresses the ways people deal with miscommunication (Albert and de Ruiter, 2018). Sometimes the term correction is used interchangeably with repair. However, a repair is neither a response to an error nor a mere replacement (Schegloff et al., 1977), it is something that advances the conversation. Communication is used to coordinate joint activity (Clark, 1996) and people tend to move a conversation forward one turn at a time as long as there is no evidence for a misunderstanding, something known as joint activity (Clark, 1996) and people tend to move a conversation forward one turn at a time as long as there is no evidence of a misunderstanding, something known as the principle of progressivity (Albert and de Ruiter, 2018). Drawing from observations of naturally occurring communication, repair describes the methods used to identify and resolve troubles of speaking, hearing and understanding (Schegloff et al., 1977). Different types of repair are differentiated by two dimensions: i) who initiates a repair, i.e. identifies a misunderstanding, and ii) who repairs it, i.e. resolves the misunderstanding. Each dimension is performed by either “self” or “other”. However, in addition to simply mending broken communication, a repair or correction may serve additional purposes. Jefferson (1987) found patterns of attendant activities such as instructing, complaining, admitting, and forgiving, just to mention a few. The repair brings the previous conversation to a halt and the correcting itself becomes the interactional business (Jefferson, 1987). This is known as exposed correction and can be used for example to express disagreement (Sidnell, 2010). In contrast, when a repair merely mends the conversation allowing the talk in progress to continue, that is known as embedded correction, a “by-the-way occurrence in some ongoing course of talk” (Jefferson, 1987, p. 95).

Studying repair in general is valuable to researchers since it operates on the surface level of communication. According to Albert and de Ruiter (2018), repair provides analysts with empirical evidence of what the participants view as problematic. A repair illustrates the aspects of the communication that are of importance to the participants and whether or not a mutual understanding is reached. As pointed out by Schegloff et al. (1977), there is a preference for self-initiated self-repair in conversations due to its speediness; the repair is often executed within the same turn as the problem is identified. Consequently, many situations that potentially could prove troublesome for the receiver never get problematic and the momentum of the conversation is maintained. However, the focus of the present paper is on other-initiated repair. Even though not as frequent as self-initiated repair, other-initiated repair is an efficient way for the recipient of a message to signal problems of understanding or hearing. As a system, other-initiated repair has been well described for communication in English (Drew, 1997; Kendrick, 2015b; Schegloff et al., 1977) as well as other languages. Contrary to previous assumptions of cultural variation, other-initiated repair is not language specific. By studying and comparing 12 different languages, Dingemanse et al. (2015) showed that other-initiated repair is frequently used and largely follows the same principles across languages. Three main types of repair initiators are used universally to signal problems of understanding: open request, restricted request, and restricted offer, and they differ in the amount of information they provide to the speaker about what part of a prior turn is being interpreted as problematic. An open request signals a problem without specifying what or where it is while a restricted request asks for clarification of a particular part of the message. A restricted offer provides an interpretation of the message which can be confirmed or corrected by the initial speaker (Dingemanse et al., 2015). These types of repair will be further described in Section 2. Furthermore, people generally tend to be as specific as possible when initiating repair, minimizing the joint effort of all conversational partners.

A common denominator for a majority of research on other-initiated repair from Schegloff et al. (1977) and onwards is the use of naturally occurring conversations as language source. Furthermore, practices of repair have mainly been studied in the context of face-to-face interaction or telephone conversations (Earnshaw, 2017). One distinguishing characteristic between these two modes is the location of speakers; unlike many modes of technologically mediated communication that only rely on verbal communication, co-located speakers can make use of visual cues. This distinction is important since previous research has shown that a bodily-visual cue can function as a repair initiator on its own (Seo and Koshik, 2010) or in combination with verbal cues (Li, 2014; Rasmussen, 2014). This warrants more research of repair practices from contexts in which speakers are unable to use visual cues for information.

The study presented in this paper is based on recorded ship-to-ship communication, which differs greatly from everyday conversations. Communication through a marine radio is restricted to verbal interaction since the interlocutors are not co-located and simultaneous or overlapping talk is made impossible due to technical properties of the radio equipment. What is more, even though English is the maritime lingua franca (Molt, 2006), almost 90 percent of speakers at sea are non-
natural English speakers (Johnson, 1999; Pritchard, 2003). This poses a challenge as seafarers with different English language skills are expected to communicate successfully with each other (IMO, 2001). Furthermore, communication in the maritime industry is generally task oriented; the coordination of work tasks between ships is a crucial component in avoiding disastrous accidents (Froholdt, 2016). These challenges, as well as others, have unfortunately led to numerous shipping accidents. Language misunderstandings are frequently found to be the main or contributory cause to accidents (Bocanegra-Valle, 2011; MARCOM Project, 1999). Pyne and Koester (2005) propose means to minimize the number of accidents related to poor communication, for example through training, improved communication procedures, and improved design of communication equipment. However, knowledge of crew interaction dynamics is crucial and should be taken into consideration when improving communication. The present paper adds to this knowledge by providing an analysis of authentic maritime communication.

The aim of the study presented in this paper is to describe the use of other-initiated repair in maritime ship-to-ship communication. More precisely, the study intends to address the following research questions: i) to what extent is other-initiated repair used in the context of icebreaker operations? ii) what are the specific practices of open request, restricted request and restricted offer? iii) what practices of other-initiated repair are used to rectify miscommunication so that the conversation can proceed? The rationale for studying the communication taking place during icebreaker operations instead of any other form of maritime communication is that icebreakers generally operate close to other vessels and consequently there is little room for error. A deviation from or a delayed response to an instruction could have a substantial impact on the safety of human lives at sea. Nonetheless, the findings presented are not limited to maritime operations and are likely applicable to other safety critical domains as well.

The remainder of the article is arranged as follows. Section 2 provides the necessary background on maritime communication and the concept of repair, followed by a description of the method for data collection and analysis in Section 3. Subsequently, Section 4 presents the way other-initiated repair is used to signal misunderstanding in maritime communication while Section 5 shows how problematic communication is resolved. Finally, Section 6 offers a concluding discussion as well as recommendations for future research, e.g. further studies on repair in safety critical communication.

2. Background

2.1. Properties of maritime communication

Within the Global Maritime Distress and Safety System (GMDSS) there are numerous means for a ship to communicate with other ships or shore stations. General radio communication includes communication which "concern[s] the management and operation of the ship and may have an impact on its safety" (IMO, 2015, p. 11) and such communication may be conducted through any channel. However, short-range ship-to-ship communication is often facilitated by Very High Frequency (VHF) radio telephony, which shares many properties with a conventional phone in that the communication is technologically mediated and the speakers are distributed in different locations and rely exclusively on verbal communication (i.e. no body language). However, at least two features of the VHF distinguish it from a conventional phone. First, most VHF channels are half-duplex channels where both transmitter and receiver operate on a single channel (frequency) making simultaneous talk impossible (Pritchard and Kalogjera, 2000). Consequently, speakers cannot signal their understanding (or lack of) by verbal fillers or interruptive comments. Second, the range of a VHF is considerably shorter compared to a conventional landline telephone. Two factors determining the range include the radio transmitter’s output power and antenna placement; furthermore, the VHF requires an uninterrupted line-of-sight between transmitter and receiver (Worley, 2011). Meteorological conditions further affect the range and may distort the radio signal, producing unwanted disturbing noise and presenting a constant risk of poor radio signals (van Kluijven, 2003). Another source of disturbing noise can be caused by interference, either from several radio transmitters operating on the same frequency (i.e. the same VHF channel) (Sheikh, 2004), or from light emitting diode (LED) lighting installed too close to radio equipment on board ships (USCG, 2018). Finally, there is also the possibility of interference from other conversations taking place on the same channel.

2.2. Standard Marine Communication Phrases

In addition to the technical aspects governed by GMDSS, verbal communication at sea is expected to adhere to IMO’s Standard Marine Communication Phrases as adopted by the 22nd Assembly in November 2001 as Resolution A.918(22), also known as the SMCP (IMO, 2001). This resolution provides seafarers with a standardized language intended to reduce the risk of misunderstandings, which potentially could impede the safety of people, vessel, or environment (IMO, 2001). Regarding language proficiency, it holds a dual purpose. In addition to setting a minimum standard of proficiency, the intention of the SMCP is to persuade native or near-native English speakers to refrain from using idioms or too eloquent language (Johnson, 1999). That way, mariners with different English skills are expected to find common ground for safe communication. To assist mariners in doing so, they are provided with a large number of specific phrases suitable for situations requiring both external and on-board communication (IMO, 2001; Johnson, 1999). However, in addition to these phrases, the SMCP resolution also provides general guidelines aiming to optimize the communicative performance (Bocanegra-Valle, 2011). These include, for example, that one should provide fully worded answers to yes/no-questions and instructions, also known as closed-loop communication.
Closed-loop communication is a device that provides feedback on messages. It encompasses a three-step process in which “a message is sent by a team member, another team member provides feedback regarding the received message and the originating team member then verifies that the intended message was received” (Flin, O’Connor and Crichton, 2008, p. 105). This is common practice within maritime traffic monitoring systems (Brødje et al., 2013) and between vessels during icebreaker operations (Boström, 2020). Still, even though the IMO (2001) emphasizes that messages should be repeated in full, research shows frequent deviations from this practice (Boström, 2020; Froholdt, 2016; John et al., 2019). However, the practice extends well beyond maritime communication. Closed-loop communication is widely used in health care (El-Shafy et al., 2018; Schuenemeyer et al., 2017) as well as in aviation (Barshi and Farris, 2016). Due to its inherent ability to enable repair of an incorrectly repeated message (Froholdt, 2016), its usefulness might be applied to all safety critical operations. Finally, in light of the focus of repair employed in this study it should be noted that close-loop communication is linguistically similar to a variety of self-initiated self-repair, namely third position repair, discussed in more detail below.

2.3. Types of repair

Depending on whether the initial speaker of a message or the receiver initiates the repair and/or resolves the issue, repair can be defined using a four-way taxonomy (Albert and de Ruiter, 2018; Schegloff et al., 1977). A self-initiated self-repair, where the speaker both identifies and repairs the message, is often manifested as a repetition or modification of part of the message. In a self-initiated other-repair, the speaker might hesitate mid-sentence indicating a problem, which is repaired by the recipient, e.g. by filling in a missing word. In other-initiated self-repair, the receiver could signal uncertainty, e.g. by uttering “Huh?” This could indicate a hearing problem or ambiguity with the prior turn, allowing the speaker to repeat or rephrase the message in the subsequent turn. Finally, other-initiated other-repair is used by the recipient to both identify and repair an element in a prior turn, e.g. replacing the speaker’s incorrect grammar during foreign language acquisition.

Even though most self-initiated self-repair is carried out in the same turn as the trouble source (Schegloff et al., 1977) there is an alternative to this practice relevant to this study and the structured nature of maritime communication. This is the case in which a first speaker delivers a turn that he or she deems adequate, and the receiver identifies no problem. Hence, the receiver proceeds by producing a next turn reflecting his or her understanding of the previous message. However, from the response, the first speaker is able to identify a problematic understanding which is then addressed in the subsequent turn (Albert and de Ruiter, 2018). Since the repair takes place in the third turn counting from the trouble source, Schegloff (1992) named this third position repair. Closed-loop communication, used for example for confirmation of instructions, can be viewed as a type of third position repair since the initiation of a repair is dependent on the utterance produced in the second turn. However, in natural conversations, the second turn where the receiver shows his or her understanding can take many forms. In contrast, closed-loop communication is a highly structured way to communicate where interlocutors are expected to repeat received messages; essentially, there is a built-in mechanism for repair. Finally, there is a natural sequential order of possible initiations of repair (Albert and de Ruiter, 2018). First, the current speaker may self-initiate a repair in the same turn, reducing the possible source of misunderstanding. If that is not done or the current speaker does not deem it necessary, the next speaker is given the opportunity to other-initiate a repair, creating an opportunity for either the receiver or the initial speaker to provide a solution. Lastly, if those checks fail there is the possibility for third position repair.

Icebreaker operations are cooperative endeavours that require the participants to have a mutually agreed understanding of the planned action. Often, verbal VHF communication is used to facilitate this understanding (Boström, 2018), and other-initiated repair provides a means for mending faulty communication as “[t]he practices of other-initiation of repair locate the source of trouble in a prior turn (e.g., pinpointing a specific word) and in some cases also characterize the type of trouble (e.g., as one of hearing or understanding)” (Kendrick, 2015b, p. 166). Three basic types of other-initiated repair initiators can be used by others to signal misunderstandings (Dingemanse et al., 2015; Drew, 1997):

- **Open request:** This signals a problem with the previous turn but without offering any clue as to where or what the problem is, e.g. “Huh?” or “I beg your pardon?”
- **Restricted request:** This repair initiation calls for a clarification of a specific part of the message, e.g. “Who?” or “At what time?” It signals that the receiver understood some parts of the message but missed a specific detail.
- **Restricted offer:** The receiver is uncertain about the correctness of a message. An interpretation of the message is proposed as a way to ask for confirmation, e.g. “You will be there at noon?”

These initiators range from least specific (open request) to most specific (restricted offer) in the amount of information they provide about the communicative problem and its solution, and there is a preference for using more specific (stronger) initiators over less specific (weaker) ones (Schegloff et al., 1977). If one employed an individualistic stance, the simplest solution would be to address any trouble source with an open request such as “Huh?”; that would certainly be taking the line of least resistance. However, for the speaker of the trouble source it would result in excessive work and therefore, according to the principle of least collaborative effort, people generally choose the repair initiator which requires the least joint effort (Dingemanse et al., 2015). This is also known as the strongest initiator rule; providing as much information about the problematic communication as possible, e.g. using the stronger initiator “You met who?” instead of the weaker “Pardon?”, leads to briefer and more accurate repairs (Clark and Schaefer, 1987). Finally, the source of trouble can also be viewed as one of
hearing, understanding or acceptability. Svennevig (2008) showed that there is a preference for initially taking the least serious approach, i.e. viewing the problem as one of hearing rather than understanding or acceptability. Taking this apparent easy way out has two advantages for participants of conversations. First, a mere repetition of the message, temporarily halting the conversation, might be enough for the repair initiator to figure out the meaning of the original utterance. Another advantage of initially treating a problem as hearing related is that it provides the speaker with an opportunity to prevent further problems of understanding or acceptability by modifying the utterance. Also, having the possibility to modify a previous statement allows participants to address delicate problems without risk of losing face.

3. Methods and procedures

3.1. Data collection

The data consists of verbal VHF communication between one icebreaker and all merchant vessels receiving icebreaker assistance from that particular icebreaker for a 40-day period during the winter of 2017. To reduce researcher interference, a non-reactive research method was used (Webb et al., 1966). A recording device was installed on board the icebreaker continuously recording the external communication for the whole duration of the winter. That design offered several advantages. First, not having the researcher present on board is likely to have made the crew less self-conscious about their speech, minimizing the risk of study subjects modifying their behaviour under observation (Marrelli, 2007). Furthermore, the long recording period made the crew grow accustomed to the recording device as well as provided a wealth of material. However, a disadvantage of the continuous recording is the difficulty of accurately calculating the amount of actual talk during a period. Therefore, the number of turns will be used as a quantifier instead of the number of hours of conversation.

3.2. Procedure of analysis

The analysis of data was completed in several steps. Initially, a simplified or denaturalized transcript was produced in which “idiosyncratic elements of speech (e.g., stutters, pauses, nonverbals, involuntary vocalizations) are removed” (Oliver et al., 2005, p. 1273). This first step was taken to facilitate the transcription of a large amount of data, while at the same time allow the researcher to get a sense of the data set as a whole. Then, the other-initiated repair sequences were identified. Central for this is the definition of other-initiated repair: “a sequence in which a turn T0 signals some trouble in a prior turn T-1 and is treated as making relevant the provision or ratification of a repair solution in a next turn T+1” (Dingemanse and Enfield, 2015, p. 99). Thus, during several readings of the transcript, the repair initiators were identified (marked as T0 below). Relative to T0, the trouble source (T-1) was then identified as well as the repair solution (T+1). These are often, but not always, located in the turn prior to and after T0, respectively (Dingemanse et al., 2016).

Subsequently, the repair sequences were thoroughly transcribed using Conversation Analysis (CA). Although CA originates from the sociological study of everyday life, the method has spread to other fields within the humanities and social sciences (Sidnell, 2016). Within the maritime field, CA has been used to analyse interaction within a bridge team (Bailey et al., 2006), and interaction between speakers who are not co-located (Froholdt, 2016). Froholdt has also used CA to analyse coping strategies during a maritime hijacking situation (Froholdt, 2017) as well as sense making processes during technologically mediated non-routine interaction (Froholdt, 2019). The method is data driven and focuses on observation. In this paper, CA is used “to locate and describe the practices of human conduct” (Sidnell, 2010, p. 28) to observe what the interlocutors find problematic. CA rests on an empirical tradition; by providing readers with ample material, they will be able to assess the reported analyses themselves (Sidnell, 2010). For this to be possible, the transcripts need not only show what is being said, but also how it is being said, i.e. highly detailed transcripts which allow an analysis of how people interact (Nevile and Walker, 2005; Tannen, 2005). The detailed repair sequences were then coded according to the type of repair initiator, e.g. open request, restricted request, or restricted offer, and the type of repair solution, e.g. a full or partial repetition of the original message or a modification of it.

3.3. Ethical considerations

At the beginning of the season, the entire bridge team on the icebreaker (i.e. all crew members that were likely to operate the VHF radio) were informed about the aim of the study and consented to having their communication recorded. Moreover, they were informed that their participation was voluntary and that the recording device offered a simple way to temporarily stop the recording without indicating who had done so if anyone would decide to opt out. However, the records show no such disengagement, possibly because the communication took place on an open radio channel available to anyone with a VHF receiver within acceptable range. Furthermore, the data presented in this study has been de-identified by the removal of names of persons, ships, and ports.

4. Other-initiated repair in ship-to-ship communication

This section presents the practices for other-initiated repair in this specific corpus. First, a quantitative distribution of the results is shown to provide an overall view of other-initiated repair (OIR) in this corpus. Then, a more detailed account of the
different practices is given with illustrative examples; the categories used are the same as those identified by Dingemanse et al. (2015) as universal principles across numerous languages: open request, restricted request and restricted offer. The examples used are truncated excerpts from authentic radio communication used to illustrate a specific point. However, it should be noted that most excerpts are part of longer conversations where other fragments have been omitted. For example, in most examples the initial call procedure has been removed.

The corpus used in this study is made up of the verbal communication between one icebreaker and the vessels receiving assistance from that particular icebreaker during a 40-day period from the winter of 2017. However, this 40-day period is not characterized by continuous talk. The amount of communication between the icebreaker and the vessels receiving assistance was substantially smaller and talk is sporadic and unevenly distributed during the period. Table 1 illustrates the distribution of talk, both in terms of number of turns per day and number of words per turn. Even though the length of the turns range from 1 to 133 words per turn, it should be noted that the data is skewed and there is a high proportion of relatively short turns. The median represents the middle value, while the lower and upper quartiles mark the bottom and top 25% of the observations respectively; this means that half of the turns contain six words or less, and a quarter of the turns contain three words or less. In total, the corpus comprises of 8,366 individual turns over 40 days.

Table 1
The distribution of talk during icebreaker operations.

<table>
<thead>
<tr>
<th></th>
<th>Number of turns per day</th>
<th>Number of words per turn</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum value</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Lower quartile (Q₁)</td>
<td>76</td>
<td>3</td>
</tr>
<tr>
<td>Median (Q₂)</td>
<td>174</td>
<td>6</td>
</tr>
<tr>
<td>Upper quartile (Q₃)</td>
<td>264</td>
<td>13</td>
</tr>
<tr>
<td>Maximum value</td>
<td>811</td>
<td>133</td>
</tr>
</tbody>
</table>

Table 2 illustrates the overall distribution of practices for other-initiated repair during icebreaker operations. The data shows that there is an OIR in approximately every 100 turns of radio communication. In contrast, Dingemanse et al. (2015) showed the occurrence of an OIR once per 1.4 min in informal social interaction across several languages. The difficulty in comparing these two figures should be born in mind, i.e. comparing number of OIRs per time unit to number of turns; still, the results indicate that OIR is less frequent in ship-to-ship communication than in general conversations. One possible reason for this difference is that radio communication is a highly structured form of conversation with other means to rectify miscommunication. This will be further discussed in Section 6.2.

Table 2
The distribution of practices for other-initiated repair during icebreaker operations.

<table>
<thead>
<tr>
<th>Other-initiated repair</th>
<th>Frequency</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open request</td>
<td>45</td>
<td>52.9%</td>
</tr>
<tr>
<td>Restricted request</td>
<td>14</td>
<td>16.5%</td>
</tr>
<tr>
<td>Restricted offer</td>
<td>26</td>
<td>30.6%</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>100%</td>
</tr>
</tbody>
</table>

4.1. Open request

The open request is the most common type of repair in this corpus, making up more than half of the repair situations. In contrast to naturally occurring conversations in English where common open requests include interjections like “Huh?” and question words like “What?” (Kendrick, 2015b), the two most common open requests in this study are the phrases “repeat” and “say again”. Both these phrases are standard phraseology within the SMCP and the following extracts provide examples of how they are used. In Extract 1, an icebreaker (IB) officer and a maritime pilot discuss the available water depth, and Extract 2 concerns safety precautions during vessel towing.

Extract 1: 2017-03-01

1 Ship: “Ok (.) we do so” (0.4) but ahh (0.2) by the way (0.5) water level is (0.8) plu::s twenty centimetres. T-1
2 IB: Could you please repeat? T0
3 (1.4)
4 Ship: Water level (.) plu::s (0.2) twenty centimetres. T+1
5 (0.5)
6 IB: Ok >1 understand< plus twenty centimetres very good to know.
The corpus shows that the phrases “repeat” and “say again” can either stand alone or appear together with a formulaic expression such as “sorry?”; a display of courtesy such as “please”, or the modal verb “could”. According to Robinson (2006), the use of an apology-based open-class repair initiator is a way of managing trouble responsibility. While a repair initiator such as “What?” implies that the responsibility for the trouble belongs to the speaker, a polite version communicates a shift in responsibility towards the repair-initiator. In the maritime context, polite talk has also been observed in bridge team interaction as a way to smooth order giving (Bailey et al., 2006). Both examples of politeness can be argued to mitigate the risk of losing face in the multicultural environment often associated with ship operations. Furthermore, the different practices of open request observed in this corpus can likely be accounted for by the properties of the VHF radio and the importance of timing of OIR. Interlocutors strive for a minimum gap between turns in a conversation (Sacks et al., 1974) and even though the gap between a trouble turn and OIR is generally longer (~700 ms) than between other turns (Kendrick, 2015a) it still constitutes only a brief gap in the conversation. Since a VHF half-duplex channel is limited to only one speaker at a time (Pritchard and Kalogjera, 2000) and a push-to-talk button has to be released before it can be activated by next speaker (van Kluijven, 2003), brief and correctly timed open requests like “Huh?” are difficult to achieve. Also, single word turns might easily go unnoticed on a ship's bridge with ample ambient noise.

Vessel operations involve a multitude of both cognitive and physical tasks. Keeping a proper watch on the VHF radio is a continuous task which has to be undertaken simultaneously with many other tasks (Boström, 2018). To initiate a communication sequence the recommended method is to address and identify which includes calling the desired ship by name (i.e. address the other) and subsequently stating one’s own ship name (i.e. identify oneself). The receiving ship will then acknowledge the call by using the same method (van Kluijven, 2003) and the conversation can then proceed. The process of address and identify is important since it guarantees that the message is intercepted by the right interlocutor as several vessels might be listening on the same channel. Adhering to this practice also gives the addressee a moment to prepare for receiving the message. Research shows, however, that there exists deviations from this proposed method (Milena, 2013), often as a shortening of the initial adjacency pair of address and respond (Pritchard and Kalogjera, 2000). The analysis of the present corpus confirms a frequent deviation from the ideal message initiation; in reality, it is not uncommon for the message to be included in the same turn as a ship is being addressed, i.e. the conversation is started before the call has been acknowledged. Two examples of this practice are offered below. In extracts 3 and 4, no other talk has preceded the following communication.

**Extract 3: 2017-02-23**

1 IB: [ship’s name] [icebreaker’s name] half ahead please half ahead. T-1
2 (3.5)
3 Ship: Uh say again […] [icebreaker’s name]? T0
4 IB: Half (0.2) ahead (0.4) half ahead. T+1
5 (5.7)
6 Ship: Ok half ahead.
7 (1.2)
8 IB: >Very nice<.

**Extract 4: 2017-02-12**

1 Ship: [icebreaker’s name] [ship’s name] our cables are fast. T-1
2 (7.0)
3 IB: (telephone rings)) ‘ehh’ sorry [ship’s name] say again. T0
4 (1.5)
5 Ship: We are cables fast, T+1
6 (0.5)
7 IB Cables fast,
Not only do Extracts 3 and 4 deviate from the prescribed protocol for addressing another ship, the examples also highlight an acute risk associated with such behaviour; there is a high risk of such a combined message to become problematic. Out of 45 open requests in the corpus, 13 were preceded by an improper address and identify sequence as shown in Extracts 3 and 4, possibly causing miscommunication simply because the receiver did not expect a message at that time in the conversation.

While the previous examples involve only two vessels, the same problem can be observed when more than two vessels operate together, e.g. while travelling in a convoy. A convoy is a group of vessels travelling together for mutual support or efficiency. This is useful during icebreaker operations as it enables an icebreaker to assist multiple vessels simultaneously. However, convoy operations are among the most hazardous situations during icebreaker operations owing to the difficulty of maintaining a suitable distance between the vessels (Valdez et al., 2015). Extract 5 shows the confusion which follows in the wake of the icebreaker which, after acknowledging a previous message from one vessel (line 1), suddenly addresses another vessel (line 2), all within the same turn.

**Extract 5:** 2017-03-04

1. IB: Ten point five ok (0.3) I will set eh the speed (0.6) to ten knots T-1
2. (0.5) ehh [ship's name] did you got that too,
3. (5.6)
4. Ship: ehh [ship's name] (.), please repeat how many knots? T0

Since the distance between vessels in a convoy is small, it is imperative that all parties mutually agree upon what speed to maintain to minimize the risk of collision. Throughout the corpus, there are several instances where three parties do manage to communicate successfully, and on those occasions there is a clear call procedure before the message; the icebreaker officer gets the attention of both assisted ships before issuing an order. However, the contrary can also be observed, as in the example above where the icebreaker suddenly shifts focus from one party to another who is not properly addressed and therefore might not have been listening actively. Even though the above extract is a restricted request and not an open request, it illustrates the issue of a trouble source becoming aggravated by a substandard address and identify procedure.

Overall, the practice of open request is more frequently used in ship-to-ship communication than in general conversations in English (cf. Kendrick (2015b)). However, in natural occurring conversations there is a preference for brief utterances like “What?” and “Huh?”, while communication at sea relies heavily on slightly longer phrases. A possible reason for this might be that the latter is technologically mediated. With ambient noise and no way to produce simultaneous talk, brief utterances can easily go unnoticed. Also, Kendrick (2015b) observed a practice of a bodily-visual cue in combination with a verbal OIR. Since this way of enhancing the spoken word is not possible through a radio the talk itself must initiate the repair, necessitating slightly longer and more elaborate wordings.

### 4.2. Restricted request

Compared to open requests, restricted requests offer a clue as to what the receiver finds problematic with the trouble source. One way this is done is with an interrogative word (a question word such as “what”, “where”, “when”, “who”), as illustrated in Extracts 6 and 7 below.

**Extract 6:** 2017-03-12

1. Ship: Yes one question will we make (.), towing (0.5) ‘or’ (.), not? T-1
2. (1.5)
3. IB: Make what? T0
4. (1.0)
5. Ship: Towing towing, T+1
6. (0.8)
7. IB: No towing.
8. (1.1)
9. Ship: Ok,

**Extract 7:** 2017-03-22

1. Ship: Eh I have one request if you can to send to me your particular. T-1
2. (4.7)
3. IB: Can you re- repeat ehh what do you want me to send. T0
4. (0.7)
5. Ship: The ship’s particulars, T+1

When interrogative words are used to initiate repair they can either stand alone, such as “Who?”, or be used with a partial repeat of the trouble source, e.g. “Who did you meet?”, and Kendrick (2015b) showed in his corpus of informal English talk that both options were roughly equally common. In the icebreaker corpus, however, all interrogatives were coupled with a partial repeat as in the examples above, i.e. there were no instances of a stand-alone question word. A possible explanation is
the radio’s limitation of only one speaker at a time. Responding with a stand-alone interrogative word requires the interlocutors to recall to what that word refers. Since the next speaker has to wait for his or her turn and cannot interrupt, a longer wait might call for a partial repeat as a way to refresh one’s mind. One could also argue that the speakers strive to be as specific as possible to minimize the joint work (Clark and Schaefer, 1987). In Extract 7, “What do you want me to send?” would have been and as a result the first speaker can easily respond with minimal effort.

Another way to make a restricted request is by giving a temporal indication as in Extract 8.

Extract 8: 2017-03-06

1 Ship: Yes good evening so hh (0.3) now we have departured (0.2) T-1
2 from (0.2) [place] and (0.5) I guess you are (0.9) more or less at the turning point. (3.1)
3 IB: Uh::hh you have departured now and wh- what did you say (;) last? T0
4 (1.2)
5 Ship: Eh (;) are you:: more or less at the turning point. T+1

Instead of indicating what the trouble source is, a temporal clue informs the sender of a message where, sequentially, the trouble source is located. This is especially evident in turns containing more than one piece of information. For example, in Extract 8 a maritime pilot informs the icebreaker that they have departed from the harbour but in the same turn also states (or indirectly asks) what they believe to be the icebreaker’s location (a place known to both parties as ‘the turning point’). The first part of the message is confirmed while the second part of the message, the trouble source, is expressed with a temporal indication.

So far, the examples offered have been practices of restricted requests and how repair is initiated. However, the analysis also showed a specific situation to be extra problematic; spoken letters and numbers seem to be a common trouble source, as in Extracts 9 and 10.

Extract 9: 2017-02-25

1 IB: The next waypoints is latitude n:grth (0.3) six four degrees (0.7) T-1
2 three seven minutes (0.7) and point one (1.0) and longitude is (0.2) T0
3 two three (0.9) six (0.3) zero ehh (0.5) minutes. (12.5)
4 Ship: Please repe:at coordinates /C14 waypoint /C14. T+1
5 (1.0)
6 IB: Yes latitude north…
7 T+1

Extract 10: 2017-03-01

1 IB: Ok understood because:: (0.5) we have a (.) narrow passage (1.0) T-1
2 in-in this lead and I have:: eight point one five metres in draft
3 for the moment. (5.5)
4 Ship: (yeah) ‘ what you say’ eight po:nt (0.4) one- (0.7) five or one. T0
5 (0.8)
6 IB: Yes that’s correct e-eight metres ehh point fifteen centimetres. T+1

Several of the restricted requests in this corpus concern numbers, e.g. an instruction on what course to steer, or letters, e.g. the spelling of a ship’s name or an e-mail address. The fact that this is a concern for ship-to-ship communication is evident in the way the correct pronunciation of letters and numbers is emphasized within the SMCP; in particular, a few numbers have a modified pronunciation compared to general English, e.g. the number three should be pronounced as “tree” and nine as “niner” to avoid confusion with other similar sounding words. Furthermore, instructions dictate when numbers should be grouped (as in “rudder fifteen degrees to starboard”) or spoken in separate digits (as in “course one five zero”) (IMO, 2001). However, the IMO (2001) does not provide empirical support for the claim that most digits are to be spoken separately. In contrast, research on aviation found only limited evidence that a grouped message format improved pilot memory and produced fewer requests for clarifications (Prinzo and Morrow, 2002). What is more, Bostrom and Østerman (2017) showed that technical solutions, which provided crew members with necessary information (e.g. a ship’s position) without having to verbally ask for it, helped immensely when encountering language difficulties. Naturally, finding ways to circumvent unnecessary communication would reduce the amount of misunderstandings like those described above.

4.3. Restricted offer

If the receiver of a message has a general understanding of the message content but is unsure of the accuracy of the interpretation he or she can proffer a reply indicating that understanding, also known as a candidate understanding (Kendrick, 2015b). Compared to a restricted request, a restricted offer has a higher degree of specificity, offering effective guidance to the speaker who, ideally, simply can confirm or reject the candidate understanding.
In Kendrick’s (2015b) corpus of English language, the most frequent practices for offering a candidate understanding are replacement, continuation and insertion. Most of these OIR practices are brief instances, where the next speaker “proffers a turn component that continues the grammatical structure of the trouble source” (Kendrick, 2015b, p. 175). In the present corpus of icebreaker communication, such brief practices are rare, likely due to the technical limitation of the VHF radio making simultaneous talk impossible. Instead, full or partial repetitions of the trouble source are frequently used together with a marker indicating uncertainty, e.g. initiating a turn with “I think you said”, “Did you say” or “So you mean”, or ending the turn with “is that correct?” or “yeah?” The latter is illustrated in Extract 11.

**Extract 11: 2017-02-14**

1. IB: Yes (.) so you (0.3) just keep your present course for the moment and T-1
2. ) (1.6)
3. Ship: Oke::y you go to starboard yeah? T0
4. (0.5)
5. IB: Yes (.) I go to starboard and you just (0.2) ‘hh continue your T+1
6. voyage hh ↓ southbound,

Just as there are certain situations that seem to be more likely to produce a repair in the form of a restricted request, there seems to be two situations that prove troublesome and often prompt a restricted offer response. The first situation is related to trouble of hearing as a result of bad radio reception and is exemplified in Extract 12.

**Extract 12: 2017-03-01**

1. Ship: Yeah around (1.9) less than (.) one mile I think that some- T-1
2. something like ( ) more accurate. (0.6)
3. IB: It’s reading you:: we-weak again it was one mile (.) ahead of me that T0
4. (.) the track should go. (0.8)
5. Ship: Around one mile (.) ahead of you is (.) turning to starboard. T+1

In the above example, the trouble of hearing is clearly manifested in the turn following the trouble source (line 4). In addition to explicitly stating that the reception is bad, the receiver forms an understanding based on the available information and offers a candidate understanding by filling in the blanks. Extract 13 exemplifies another type of situation that often results in a repair in the form of a restricted offer.

**Extract 13: 2017-02-16**

1. IB: I will lead you into the ice track of [ship’s name] (0.8) and (0.4) T-1
2. I will turn to starboard and you follow the ice track (0.3) ‘hh and
3. then you change (.) VHF channel (0.3) nine zero nine, (0.5) that T0
4. is the assisting channel for (.) icebreaker [icebreaker’s name].
5. Ship: E::h (0.2) yeah well please repeat I (0.4) I only understand that I T0
6. have to change channel (.) channel nine is that correct?

Here, the trouble source is a compound message, i.e. a long or complex message. The receiver is unable to receive the whole message and therefore picks out what is believed to be the essential part of that message and tests his or her understanding by initiating a repair (lines 5–6). It is then up to the first speaker to either confirm, correct, and/or repeat until a mutual understanding is reached.

The practices used for initiating a repair with a restricted offer generally seem to spring from the technical limitations of the VHF radio, either in the form of weak reception of the radio signal that makes hearing difficult, or as a limitation from not being able to talk simultaneously. The next section will examine the means used to restore a mutual understanding and progress the conversation.

5. How the problem is resolved

To resolve a trouble turn, the most common method in this corpus is for the first speaker to repeat the original message either as a full repeat including all elements of the original message or as a partial repeat. Omissions of minor dispensable items are acceptable while still categorizing the repair solution as a repeat (Dingemanse et al., 2016). Out of 85 OIR turns, 63 are solved by a full or partial repeat. An open request OIR primarily prompts a full repeat, while restricted request or restricted offer OIRs are more likely to produce a partial repeat. This difference is likely linked to the specificity of the repair initiation. Since an open request does not point to a specific problem, the natural solution for the first speaker is to repeat the message in full. Contrary to that, a restricted request or a restricted offer is by nature more specific, reducing the need for a full repeat. Furthermore, many repair solutions also include some kind of modification; in the present corpus, modifications are
manifested either through the addition of a new element to the original message or as one part of the message being rephrased. Extract 14 exemplify several aspects of OIR mentioned so far.

**Extract 14:** 2017-03-21

1 IB: Good evening Sir question (.) what is your flag.        T-1
2 (2.7)
3 Ship: Sorry? T0
4 (0.3)
5 IB: What is your nationality (. ) your flag. T+1/T-1
6 (11.0)
7 Ship: [Ship's name] please repeat more once time "please" T0
8 (1.1)
9 IB: Question what is your flag (. ) your home port. T+1
10 (0.7)
11 Ship: My flag is (. ) [country] <.

An icebreaker officer is asking about a vessel's flag. The flag state of a vessel, or more colloquially just 'the flag', is the country in which a vessel is registered and also gives the vessel its nationality. Essentially, the vessel falls under the jurisdiction of that nation. The first message in the example above is met with an OIR in the form of an open request (line 3). As a repair solution, the icebreaker officer repeats the message with additional information, which aims to clarify that it is the vessel's nationality that is being requested (line 5). When the desired response is still not received (line 7), the message is once more modified with additional information (line 9) and the desired result is reached (line 11).

In the present data material, almost all OIR sequences are resolved by the repair solution following directly after the trouble source having been identified by the second speaker (T+1). There are a few instances where both interlocutors seem to have a problem associated with hearing, possibly due to unwanted radio noise resulting in a back-and-forth open request OIR until either party takes alternative action. For example, Extract 14 exemplifies a situation that requires several turns to be solved but not necessarily due to problems in hearing. The first repair solution proposed by the original speaker is unsuccessful and consequently viewed by the receiver as a new trouble source; line 5 is therefore marked as both T+1 and T-1. The back-and-forth conversation continues with a new repair initiation and solution until the receiver signals his or her understanding (line 11); at that moment, progressivity is resumed and the communication can move forward.

Another way to resolve a trouble turn is by confirming (or rejecting) a response offered by the receiver of a trouble source. In the analysis of the icebreaker corpus, there were 17 confirmations, all acknowledging a previous candidate understanding. These instances confirm that people often adhere to the principle of least collaborative effort (Dingemanse et al., 2015). By providing a restricted offer, i.e. a strong repair initiator with as much detail as possible, the first speaker can easily confirm or reject this candidate understanding; that way the mutual effort is kept to a minimum.

Finally, there is one more repair solution that needs to be mentioned. Extract 15 illustrated the practice of providing a completely new message instead of repeating or modifying the previous one.

**Extract 15:** 2017-03-01

1 Ship: [icebreaker's name] [ship's name] uh (0.7) uh do you (. ) her me now. T-1
2 (5.6)
3 IB: Could you please repeat? T0
4 (0.6)
5 Ship: How this radio working. T+1
6 (0.5)
7 IB: This one ehh (. ) is better.

By providing a new message, the first speaker abandons the original message and tries out a new solution to get the intended meaning across. Another example is shown in Extract 16. Here, a ship has been assisted by the icebreaker for the past 2 h. The ship has repeatedly become stuck in the ice and is now following close behind the icebreaker but is having difficulties steering straight in the ice channel, something that increases the risk of becoming stuck once again.

**Extract 16:** 2017-03-07

1 IB: [ship's name] try and stay (. ) aligned with the icebreaker (. ) try and use your rudder and stay aligned with the icebreaker. T-1
2 (2.0)
3 Ship: Sorry (. ) say again? T0
4 (2.0)
5 IB: Hard for starboard hard to starboard please. T+1
6 (0.7)
7 Ship: Rudder hard to starboard all time,

When the first message is unsuccessful in delivering its intended instruction, the speaker tries a simpler and more direct approach. To a crew with only limited experience of ice navigation, lines 1–2 in the extract above are likely viewed as
extremely vague; the phrase “to stay aligned with something” is not among the recommended expressions in the SMCP, and the instruction “use your rudder” does not inform the recipient of how this should be done. As a result, the icebreaker regresses to providing simple instructions in the form of a direct rudder order (line 6). However, a more experienced ice navigator might have understood the initial complex message. Boström and Osterman (2017) showed that the experience of crews navigating in ice varies greatly and with thorough knowledge about what to expect when following an icebreaker one is more likely to grasp a wider array of expressions.

6. Concluding discussion

Departing from a quantification of the use of other-initiated repair, this study has aimed to describe the use of other-initiated repair in maritime ship-to-ship communication by means of conversation analysis. Three research questions were used to further break down the aim: i) to what extent is other-initiated repair used in the context of icebreaker operations? ii) what are the specific practices of open request, restricted request and restricted offer? iii) what practices of other-initiated repair are used to rectify miscommunication so that the conversation can proceed? First, the results showed that other-initiated repair is used to a lesser extent in maritime communication compared to informal social talk. Still, it is used at a rate of approximately once every 100 turns. Second, a full account of the distribution of practices used to initiate repair was presented in Table 2. Nevertheless, the results showed that an open request is the most common way to signal misunderstandings, often done by using the standard phrases “repeat” or “say again”. When a restricted request is used, it is often coupled with a partial repeat to assist the first speaker by providing as much information as possible about what has, or has not, been understood. A restricted offer, i.e. when the receiver offers a reply for verification, is typically the result of problems of hearing due to bad radio reception or difficulty recalling all information from a long message. Third, the results showed that the most common repair solution is a full or partial repeat of the original message. This agrees with the high number of open requests in the corpus. Since an open request provides no guidance as to what the receiver finds problematic, the obvious solution is to repeat the message in full.

The empirical data for the study has been drawn from authentic ship-to-ship communication. To some extent, similar principles of initiating repair and correcting trouble conversations were observed in this corpus, compared to that of Kendrick (2015b). Nonetheless, the results indicate a different relative distribution of the practices; in particular, a larger proportion of open request other-initiation repair was observed, partly due to technical limitations of the VHF radio, e.g. bad reception. Even though this study has focused on communication during icebreaker operations, the findings are likely applicable to other domains as well. The operation of icebreakers is characterized by small margins and severe consequences in case of an accident, characteristics shared by several other safety critical domains.

6.1. Imbedded slowness in radio communication

One-way radio communication has an inherent slowness stemming from its inability to facilitate simultaneous talk. Even though turn-allocation techniques seldom are a concern in maritime radio communication since there often are only two speakers involved (and when more than two parties are involved, current speaker selects next or self-selection is often used successfully), speakers still have to wait for their turn. This has a number of implications for how conversations are conducted. First, since the silent listener has no means to indicate their understanding (e.g. by saying “what?” or by nodding), long or complex messages easily become problematic. This confirms previous findings by Froholdt (2010) who noted that with an elongated turn, for example when a speaker seeks confirmation of several actions at once, not having means to reciprocate can promote difficulty in providing a relevant answer. More recently, Boström (2020) showed that longer messages were poorly repeated, relative to brief and simple ones. Second, the relatively long pause in between turns tend to deter the use of a single interrogative word as a restricted request; instead, the interrogative word is coupled with a partial repeat, clearly addressing a specific problem. By being aware of these implications caused by the slowness of radio communication, both speakers can proactively contribute to effective communication. The initial speaker should keep messages brief, splitting long message into appropriate individual messages that can be acknowledge one by one; and the receiver should always be as specific as possible when initiating repair, providing ample information to facilitate an optimal repair solution.

Not being able to see each other clearly affects the communication process. Seo and Koshik (2010) showed that nonverbal cues alone could be understood as initiating repair, a practice done by both native and non-native speakers. Even though Kendrick (2015b) only found two instances of pure bodily-visual cues to initiate repair, there were 24 instances out of 227 other-initiated repair in which visual cues were observed in combination with a verbal repair initiation. Gestures are different from talk in that they exist on a different level and can co-occur with talk without interrupting it. This also means that a gesture can be extended beyond the point of indicating a problem until the targeted problem has been solved (Seo and Koshik, 2010). For example, when a frowning face or tilted head returns to a normal posture, that cue could signal understanding. That way, visual cues have the potential not only to speed up repair initiations but also to signal understanding and indicate when a conversation is once again back on track. Marine radio communication lacks this possibility since the speakers are separated in different locations. Not only must an agreement be derived solely on verbal information, the receiver also has to wait for the speaker to hand over the turn before an acknowledgement can be made. Both these restrictions hamper the talk by creating an inherent slowness.
6.2. Implications for practice

Ship-to-ship communication, which has been the focus of this study, differs from many other types of naturally occurring conversations in several ways: it is technologically mediated and the interlocutors are not co-located, which in turn excludes the use of nonverbal communication. What is more, maritime communication is a highly structured form of communication. When a speaker addresses another ship, this is done with a specific purpose, e.g. to give an instruction or ask for information, small talk is hardly ever the reason. Furthermore, based on previous experience and the situation at hand, the receiver is likely to have at least some idea about the topic of the conversation ahead. But it is not only the content that is predetermined, the form of the conversation is structured as well, mainly by the use of closed-loop communication, and this has implications for the way communication is repaired.

Closed-loop communication has an inherent mechanism for rectifying trouble communication. The fact that a message is repeated by the receiver offers a suitable way for the first speaker to either acknowledge the correctness of the repeated message or to correct it (Flin et al., 2008). This way of correcting mistakes corresponds to what Schegloff (1992) termed self-initiated third position repair. By making efficient use of closed-loop communication, many mistakes will be identified and corrected by the first speaker in the third position after the trouble source. Furthermore, that is a possible reason for the lower number of other-initiated repairs observed in this study of ship-to-ship communication compared to the higher frequency in naturally occurring conversations reported by both Kendrick (2015b) and Dingemanse et al. (2015). Conclusively, closed-loop communication is such a fundamental element of ship-to-ship communication that messages routinely are repeated. Hence, depending on the receiver’s own interpretation of the message there are two possible outcomes that include a repair. Either, the receiver is uncertain of the message and indicates this by issuing an other-initiated repair. Or, if unaware of a faulty interpretation, the repeated message gets corrected by the first speaker. In either case, the repair solution is executed in the third position following the trouble source.

In light of this study, there are a number of areas that could benefit from further research. A similar analysis of critical communication from another icebreaker, or from another domain, could assess the generalizability of the results. Furthermore, by examining the use of repair as a function of experience of the domain, e.g. experience of ice navigation, the linkage between experience and training on the one hand and communication practices on the other, could be strengthened. This could in turn inform decision makers and training institutions in their roles of setting appropriate safety standards and designing effective training. Finally, it is worth noting that this study has used a combination of a simplified transcript, which enabled transcription of a large quantity of talk, and conversation analysis, which provided detailed transcriptions of certain parts of it. However, the amount of freely available detailed transcripts of maritime communication is scarce. Still, for studies that do not require the same level of detail there is a plethora of accident transcripts provided by various national accident investigation authorities. Further research could investigate whether such transcripts might be used for studies of repair, similar to the one presented in this paper.

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References


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