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**How transactivity in learner group talk affects collective knowledge construction.**

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Philosophy



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## Abstract

This linguistic-based study aims to contribute to scholarship in the field of the learning sciences by investigating how collective knowledge construction (CKC) is affected by transactivity in spoken interaction among learners working in small groups. Data was collected for the study by audio recording spoken interaction among learners in an English for Academic Purposes (EAP) setting.

Following the work of Berkowitz and Gibbs (1983), Teasley (1997), Stahl (2006), and Van Heijst et al. (2019), transactivity is defined in the present study as the notion of relating to others by making one's reasoning explicit and showing openness whilst engaged in epistemic interaction; i.e. speaking which aims to develop knowledge. This concept has been linked to collective knowledge construction in learning settings (Schwarz & Baker, 2017). In the present study, a conversation analysis-informed approach was applied with the objective of providing an understanding of how learners understand each other (Koschmann, 2011, p. 435) when engaged in spoken activity. The research framework is designed to examine the extent and nature of transactivity in the dataset of recorded group talk, and aims to find links between this and indicators of CKC in the data. CKC is measured in this qualitative study by focusing on the process of how participants develop ideas collectively during the discussion, rather than by conducting pre and post testing of learners' knowledge.

The research questions in the present study address transactivity by breaking the construct down into three integral aspects: explicit reasoning, relationality among group speakers, and cognitive openness; which are explored individually and holistically. Following the parameters of conversation analysis, an examination of the sequencing of speakers' turns allows the recorded group interaction to be considered from a deductive perspective to reveal how participants relate to each other by responding, questioning, challenging, or adding to each other's points. Within that wider prism of turn construction, a micro level lens is placed on the data by identifying lexico-grammatical and prosodic linguistic features linked to transactivity. The findings from the data analysis show that although transactivity provides the linguistic mechanism for speakers to collectively construct knowledge, CKC is not guaranteed. Rather collective knowledge construction emerges when there are heightened levels of intersubjectivity. Such

intersubjectivity is dependent on learner agency; whereby speakers engage with and develop each other's ideas.

The present study crosses the disciplines of linguistics and education to address the question of what effective collaborative dialogue may look like (Weinberger & Fischer 2006), and to consider how it may be practiced in learning settings.

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## **Author's Declaration**

I declare that, except where explicit reference is made to the contribution of others, that this dissertation is the result of my own work and has not been submitted for any other degree at the University of Glasgow or any other institution.

Signature - Janine McNair

Printed Name - JANINE MCNAIR

## Abbreviations

List of definitions for the abbreviations and acronyms used in this thesis:

CA	conversation analysis
CKC	collective knowledge construction
CSCL	computer supported collaborative learning
EAP	English for academic purposes
EXP	Explicit Reasoning
FPP	first pair part
IELTS	international English language testing system
JPS	joint problem solving
L1	first language
L2	second language
OP	cognitive openness
REL	Relationality between speakers
SPP	second pair part
TBL	task-based learning
TCU	turn construction unit
TRP	transition relevance place

# Chapter 1 Introduction

## 1.1 Background and aims of study

This thesis is concerned with how collective knowledge construction (CKC) is affected by transactivity as small groups of learners engage in spoken interaction to complete course tasks. Transactivity is defined by Berkowitz and Gibbs (1983, p. 402) as “reasoning that operates the reasoning of another”. In the present study this concept is broken down into three aspects: the explicit expression of reasoning (Weinberger & Fischer, 2006; Tegos et al., 2016, p. 420), relationality between speakers or operating on other speakers’ turns (Fiacco & Rosé, 2018; Kimmerle et al., 2021, p. 190); and cognitive openness towards different viewpoints and contributions made by others (van Heijst et al., 2019). The present study investigates how participants pick up on each other’s points and the resulting development of knowledge. It does this by reviewing literature from the field of the learning sciences to consider theory about how collective knowledge construction occurs. The study uses a dataset of spoken interaction which was recorded when students who were taking part in an English for Academic Purpose (EAP) programme worked on a task in small groups.

The analysis applies a conversation analysis-informed approach to see how speakers engage with each other during task work, by looking at turn construction and sequencing. Within that wider plane, the study establishes the scope to use linguistic features as indicators of interactional patterns. For example, a speaker’s use of hedging structures may express an idea as a hypothesis rather than a certainty. This notion is associated with participants’ recognition of alternative viewpoints and may therefore indicate cognitive openness (Schwarz & Baker, 2017, p. 162).

Central to the present study is the notion established by the dialogical approach, that the construction of knowledge is an intermental process (van Heijst et al., 2019, p. 169), through which new ideas emerge from a multivocal dialogue which encompasses multiple perspectives (Koschmann 1999a; Wegerif et al., 2010; Suthers et al., 2013). Indeed, knowledge construction in student-to-student interaction occurs as a process, whereby learners’ mental models are explicitly shared, mutually explored and possibly integrated (Stahl & Rosé 2011). With a

view to gaining insights into how transactive interaction may foster intermental processes of knowledge development, this study focuses on a joint problem-solving (Sarmiento-Klapper, 2009, p. 83) task which requires groups to discuss *True or False Statements* based on content about *summary paragraph writing* from their common course work.

On the continuum of learning theory from a tacit individual process, to a socio-constructivist one (Lund & Suthers, 2013), the present study is situated on the social side since it is concerned with classroom dynamics and spoken communication in particular. It is not within the scope of the present study to focus on the effect of psychological human aspects such as emotion or mood (Mercer, 2019) or to account for psycho-cognitive aspects (Van Eemeren et al., 1996, pp. 276-7) within peer interaction. Therefore, emphasis is placed on the conversational dynamics of groups in classroom talk (Sawyer et al., 2013, p. 144), rather than on individual outcomes or incentives (Slavin, 1991). Such an emphasis aligns with the contemporary pedagogical practice towards student-centred learning, with small groups of learners working through tasks autonomously and aspires to meet Tegos et al.'s (2015) criteria of contributing to the improvement of student-centred learning.

The present study is underpinned by the notion that knowledge construction is related to the effort that group members make to build and maintain shared understanding (Schwartz, 1995 in Dillenbourg & Traum, 2006, p. 121; Roschelle & Teasley, 1995, p. 70) through effective collective interaction (Borge & Rosé, 2021). Thus the study upholds the view that collective knowledge construction occurs through the effort-bound process of speakers' dialogic interaction (Bakhtin, 1984, p. 110). The present study integrates extrinsic features of the interaction such as the use of reported structures when a speaker picks up on another's point, with the more implicit notion of intersubjectivity, as participants engage with one another's thoughts.

According to Edwards (2006, p. 42), it is the primary work of language to account for the more hidden factors which may affect knowledge construction. In order to probe the intersubjective aspects of communication which underlie group task-based talk (Heritage & Atkinson, 1984, p. 10), and evaluate the effects of these on collective learning, the present study examines linguistic features which have

been linked to transactivity in published studies within the field of the learning sciences.

It will be seen that the three dimensions recognised as central aspects of transactive discussion (explicit reasoning, relationality with others, and cognitive openness) are interconnected. The application of a conversation analysis (CA) informed method in the present study renders salient sequential patterns of group interaction (Sawyer & Berson, 2004, p. 405), and may contribute to opening up the black box of collaboration (Bossert, 1989, p. 235).

## **1.2 The context of the study**

The present study investigates transactivity in learner interaction by placing a lens on the talk that occurs when two groups of English for Academic Purpose students work through a group task. The EAP student cohort on pre-sessional and in-sessional courses taking place at Higher Education (HE) institutions around the world are mainly speakers of English as a second language, known as L2 learners in the community. Most of these students are graduates from a range of countries, who are set to embark on a Master's degree course in an English-speaking country, and who require the endorsement from the EAP department that they have reached the entry level of English in order to access their desired post-graduate course. For example, a student who is going to do a Biomedical Sciences MSc may require an International English Language Test (IELTS) result at overall 7, whilst one who is going to do a Data Management MSc may need to reach a 6.5. Requirements vary slightly between institutions as well as between programmes within one institution. The focus of the EAP curriculum is on skills such as academic essay writing, seminar discussions or presentations, and an underlying objective of EAP course organisation is that students will improve their collaboration skills in line with other graduate attributes recognised by many universities and other HE institutions in the western hemisphere as desirable competences for work and study in the twenty-first century. In line with this notion, the onus behind the methodology in much contemporary EAP is on speaking to learn rather than learning to speak (Basturkmen, 2016, p. 154).

Although the task revolves around the competence of writing a summary paragraph, there is a wider omnipresent goal for the students to develop

communicative skills which will allow them to function successfully in current and future group-based settings. As well as this, community knowledge creation is seen as beneficial in helping students develop ways of thinking and the skills necessary to flexibly adapt to changes in our society, and also to develop ideas and insights as a basis for innovation (Paavola & Hakkarainen 2005).

The present study follows the belief that transactivity theory is congruous with the emphasis on critical thinking in contemporary higher education because it implies that interactants must closely operate on the reasoning of their peers (Kimmerle et al., 2021, p. 190) as opposed to simply accepting peers' contributions. Such behaviour requires a productive rather than a passive approach to learning (Damşa, 2014, p. 247), and goes beyond mere knowledge transmission.

### **1.3 The currency of the study**

While in the past the main vehicles of academic communication were written texts, now a broad range of modalities and presentational forms confront and challenge students' spoken communicative competence (Hyland, 2012).

The current study aims to respond to the claim made by Schwarz and Baker (2017), that there is not much published work on the intricacies of peer-to-peer classroom interaction. More specifically, the goals and motives of the present study are not dissimilar to those of van Heijst et al. (2019), who claim that there is a need for studies which investigate the relation between openness in peer interaction and knowledge construction. It is therefore considered that this study has currency for both online and face-to-face communicative EAP learning settings, where the interaction is synchronous. Although early discourse-based studies of learner spoken communication have drawn on data from face-to-face settings (Farr, 2003), much research in the 21<sup>st</sup> century has begun to examine computer-mediated communication (CMC) given the prevailing trend towards online learning environments. For example, Tegos et al. (2015) state their purpose as one which contributes to the design of digital tools which may facilitate effective collaborative learning. In many such studies, the construct of transactivity is a recurring feature, which is what renders those projects highly relevant to the present study, even if many studies conducted in the field of CSCL utilize

asynchronous student-to-student discourse produced in the form of typed chats on digital learning platforms (Schwarz & Baker, 2017, p. 181), as opposed to live spoken interaction.

Although the question of “which kinds of talk lead to learning” (Teasley, 1997, p. 362), is not a new area of study, there are few studies which focus on how Transactivity in student-to-student spoken interaction affects Collective Knowledge Construction. Seminal articles link Transactivity to understanding in different learning settings. For example, Teasley (1997), aims to determine if transactive discussion forms the basis of productive peer collaborations in school settings and uses the example of Tudge’s (1992) study of children working together in the mathematical domain. The present study assumes the importance of students being actively engaged in the learning process by actively participating in the co-construction of knowledge through dialogue with peers. This type of engagement may provide opportunities for students to formulate their thinking through speaking (Haneda and Wells, 2013).

Schwarz and Baker (2017), distinguish the body of published research which focuses on collaborative interaction from that which centres on student cooperation and explores aspects such as the effect of learner group sizes. Citing projects such as Dillenbourg et al. (1996), as examples which centre on how groups interact through examination of dialogue and are classed as examples of research about Collaborative Learning, Schwarz and Baker (2017) stress the value of going beyond a frequency approach, in order to understand how elements in the dialogue may be affecting one another. Accordingly, although the research design for the present study incorporates some numerical data to gauge the ubiquity of instances of transactivity and indicators of collective knowledge construction, it avoids prioritizing a quantitative technique, instead adopting a conversation analysis-informed qualitative approach (Cohen et al., 2017, p. 287) to uncover and learn about the correlations between features and their organisation in the dialogue.

Wise & Chiu (2011, p. 65) advocate a focus on sequencing to discover how knowledge is constructed between learners, and Stahl (2011, p. 534) stresses the need in the virtual age, to pursue the question of how knowledge building happens as a shared process, through verbal interaction. Although there are undoubtedly

multiple conditions which may affect the interaction, such as students' social and cultural backgrounds, or technological experience (Damşa, 2014) in the online context, these are beyond the scope of the present study. Instead, following the tradition of conversation analysis (CA), I aim to use only what information is found in the data set (Lester & O'Reilly, 2019), and to make claims based on what is visible in the data (Martin & White, 2005 in Howley et al., 2013a; Koschmann, 2011).

Giles et al. (2017, p. 37) suggest that the application of CA provides a useful means for the analyst to gain insights into social interaction when turns between participants are not necessarily juxtaposed or linear. The present study hinges on the sequencing of speakers' turns to probe the significance of relationality on learning outcomes within a classroom setting where it is recognised in the literature that peer-to-peer interaction is often untidy and unstructured (Edwards & Westgate, 1994, p. 57). CA is considered a suitable approach to address the multi-layered nature of such peer-to-peer classroom interaction (Gosen et al., 2024). Indeed, CA facilitates the iterative and inductive study of the structure of collaborative partner interactions (Simpson et al. 2017) where sequencing may be non-adjacent, and connections between points may not be immediately apparent. In other words, participants may backchannel and pick up on points raised by co-members at any previous stage in the task interaction. Such potential non-adjacent relationality has implications for how points are developed among participants, and ultimately on how knowledge is constructed through a process of problem-solving (Stahl, 2009, p. 15).

Furthermore, CA places a focus on naturally-occurring group spoken interaction (Heritage & Atkinson, 1984, p. 3), which complies with the present study where participants negotiate the terms of interaction (Edwards and Westgate, 1994, p. 50), as they work through the task together. As can be seen in the range of lengths and variety of patterns in the data set for the present study, the spoken interaction recorded in this study can be described as unstructured and naturally occurring (Uttamchandani & Lester, 2021, p. 27).

The present study uses samples of group dialogue, recorded in an EAP setting, to explore the notion that meaning and understanding are constructed (Stahl & Rosé, 2011) through collective interaction, and take the findings forward to inform

educator practice when faced with the task of helping students to improve their speaking strategies. The participants in the present study are engaged in a common aim, or community of practice (Lave & Wenger, 1991) as they discuss statements in order to complete a task. The task is based on curriculum material that has been delivered to the students in recent lessons and deals with how to summarise an academic article in one paragraph.

In light of Wilkinson's (1991, p. 134) claim that knowledge is developed through the process of talking, the present study aims to reveal how this happens through connections between turns irrespective of whether these are adjacent or distanced and regardless of which answer the speakers opt for. It is how the groups handle the actual spoken communication between them in a live situation that has emerged as valuable for what Koschmann (2011, p. 435) terms "understanding understanding in action". Whilst I accept Wilkinson's (1991, p. 134) claim that any peer talk is beneficial to knowledge building, especially in classrooms where a student-centred approach is prioritised, it is important to consider the effect of the quality of the interaction on the prolongation and development of ideas. As Wertsch (2002, p. 108) highlights, in synchronous interaction, whether the format is online or face-to-face, there is an important distinction between a perfunctory type of dialogue, where utterances are formulaic (Basturkmen, 2002), and dialogue where speakers show engagement with themes.

## **1.4 Summary**

This chapter has provided an overview of the key themes in this thesis as well as providing a view of the cross-disciplinary nature of the study. The rest of the thesis is organised according to the outline presented below.

Chapter 2 justifies the criteria behind the selection of literature which has informed the present study. It presents a review of published studies which investigate aspects of peer interaction such as transactivity, intersubjectivity or dialogism, and integrates them with pertinent themes of learning theory including collaborative learning, collective knowledge construction and productive agency.

Chapter 3 documents the methodology and the research design implemented in the present study.

Chapter 4 is dedicated to the data analysis process and full data set used in the study. The findings are presented in tables.

Chapter 5 evaluates the results of the data analysis and discusses the relevance of the findings in relation to the research questions established in the study by addressing the themes outlined in chapter 2.

Chapter 6, presents the conclusion and implications for practice of the study. It emphasises the need for effective student-to-student dialogue in contemporary learning settings. Proposals are made about possible ways to share the findings and implications of the present study at teacher training events and a framework is proposed for use with students. This implies the recognition of group task-based speaking as a communicative genre in education settings, so that the status of such interaction may be raised within learning communities.

## Chapter 2 Literature Review

### 2.1 Overview and outline of the chapter

This chapter engages with literature from both linguistics and the learning sciences, particularly with published sources which are concerned with collaborative peer interaction, including computer-supported collaborative learning (CSCL). As is affirmed by Suthers et al. (2010, p. 5), the relationship between interaction and learning is a central concern in the field of the learning sciences.

The omnipresence of both face-to-face interaction (Mayfield & Rosé, 2011) and chat threads (Howley et al., 2012) in studies of transactivity is recognised by Howley et al. (2013a). A review of published literature in the field of the learning sciences shows fewer studies of transactivity in live spoken interaction than there are of asynchronous interaction. Some of the studies examined in this chapter, centre on asynchronous interaction (Ziegler et al., 2006; Chi, 2009), rather than ‘hearable talk’ (Lester & O’Reilly, 2019). Such sources have proved pertinent to the present study given their development of investigation around interaction patterns in peer-to-peer communication, even if it is not in a spoken format. At the same time, studies of synchronous classroom interaction from face-to-face learner settings such as Isohätälä et al. (2020) or Shirouzu (2013) are influential on the present study for the way they integrate scholarship from the fields of linguistics, CSCL, and education. Some studies of synchronous peer interaction which apply a CA-informed approach, such as Roschelle (1992); Sionti et al. (2012); or Koschmann (2013), have had a substantial impact on the present study given their focus on rendering salient the sequencing of participants’ contributions. For example, Wise et al.’s (2013) study looks at sequencing of participants’ posts in a chat thread to probe the correlations between features of the interaction and a shift in knowledge.

Some CSCL studies which focus on the development of digital agents to foster peer learning, such as Tegos et al. (2015), have influenced the present study due to their exploration of interactional patterns in group learning. Tegos et al. (2016) cites findings from non-digital contextualised studies such as Michaels et al., (2008), Sohmer et al. (2009), Michaels et al. (2010), or Michaels and O’Connor

(2013), to highlight linguistic structures that are conducive to collective knowledge construction (CKC). Tegos et al. (2016, p. 419) select some discursive structures related to building on prior knowledge, by pressing for or expanding on others' reasoning. Tegos et al. (2016, p. 420) also draw attention to another notion which is central to transactivity, that of explicit reasoning found in learners' contributions. In order to account for explicit reasoning, Tegos et al. (2016, p. 420) refer to the need to provide reasons for a claim and to externalise one's ideas. In terms of methodological approaches, Tegos et al. (2016) usefully demonstrate the value of examining whole sections of interaction corresponding to the group completion of one task question in order to determine patterns of how participants may be operating on each other over several turns.

Essentially, it is the premise of CKC being achieved through peer talk which is at the core of the present study, rather than who the learners are, what they are learning or the format through which they are doing it. In particular, this literature review engages with published studies, such as Roschelle (1992), Koschmann (2013) or Stahl (2013), which aim to understand the dynamics at play in small group dialogues where students are engaged collectively in a task, and which probe the effect of this on CKC. Such work has proved useful for illuminating how a focus on linguistic features and structures found in data sets of peer-to-peer interaction can lead to insights into CKC. Both the methods employed and the claims made in such studies have been influential in the development of the present study. For example, Stahl and Rosé's (2011) study illuminates linguistic connections between learners' utterances and shows how an earlier turn may connect to a later non-adjacent one within the group dialogue.

Section 2.2 examines the concept of transactivity as defined and used in the present study by using precedents from existing studies. Each of the three dimensions related to transactivity in the present study; explicit reasoning, relationality and cognitive openness, is explored and discussed. This section aims to illuminate how linguistic features can be associated with each dimension of transactivity by providing examples found in the literature. Table 2-1 presents a list of the linguistic features related to the three dimensions of transactivity and which are central to the data analysis work presented in chapter 4.

Section 2.3 aims to explain what is meant by CKC in the present study, by engaging with learning theory which debates the positioning of CKC within the parameters of cognitive and social models of learning. This section offers a rationale for treating CKC as a social construct which is dependent on the linguistic process which occurs between learners as they work in groups.

Having established that it is socio-constructivist theory which underpins the present study, section 2.4 goes on to define and explain the specific indicators which are related to CKC in the literature. These indicators are: change of a speaker's view; challenge of view from one speaker to another; the emergence of new idea in the interaction; and follow-up of idea. The section considers how these indicators may affect or be affected by the prolongation of the interaction, as well as how they are linked in the literature to more creative types of talk such as that which may express the reformulation of ideas. Prolongation of interaction is assumed in the present study to be indirectly linked to the emergence of CKC. For this reason, prolongation of talk is included as a factor to be accounted for in the data analysis of the present study. However, as is indicated by van Heijst et al. (2019), prolongation does not guarantee CKC, nor is CKC dependent on the length of interaction. In fact van Heijst et al. (2019, p. 182) recognise that although their study produces findings about how openness can lead to follow up (van Heijst et al., 2019, p. 170), it does not discover how prolongation relates to evidence of knowledge building.

Section 2.4 also places a lens on the interaction itself by exploring aspects of the type of talk produced, such as exploratory types of talk. The section reflects on the implications of the quality of the talk produced in student groups (Mercer, 2013) which leads on to the theme of knowledge creation discourse, and includes the notion of speakers' reference to shared objects in the interaction, as well as of speakers' reformulation of phrases to convince others or help illuminate a point that others do not understand.

Section 2.5 probes literature from the learning sciences to consider how transactivity may lead to CKC not only by prolonging the talk but by embodying the mechanism through which the group discussion may branch out through the generation and development of ideas. Each of the dimensions of transactivity is considered from the perspective of how it may foster CKC.

Section 2.6 presents the research questions of the present study and offers comprehensive explanation as to what these are designed to achieve and why it is important for the development of this work.

Section 2.7 outlines and provides criteria for the application of Conversation Analysis (CA) as a method which aligns with both the theory and the practice of the current study.

## **2.2 Transactivity in the literature**

The present study is concerned with transactivity within reasoning talk, which is defined in the sense of epistemic discussion, whereby learners produce utterances which embody engagement with theoretical concepts (Weinberger & Fischer, 2006; Howley et al., 2013a, p. 208), as opposed to functional or performative utterances (Austin, 1962). Often such discussion occurs when students are engaged in task-based learning (TBL). Psychologists Berkowitz and Gibbs (1983), who investigated the effects of transactivity in teenage peer talk, accredited the notion of “transactive discussion” to educationalists Dewey and Bentley (1949). The notion has been significant in studies of learner collaboration, such as that of Azmitia & Montgomery (1993) who considered the effect of transactivity on learning outcomes where friendship is a factor.

Berkowitz and Gibbs (1983) highlighted how in peer discussion various ideas and topic threads interject and connect with one another without a designated order. The notion of non-linearity is explained by Stahl (2006) who advocates that the modus operandi of peer interactants is to openly connect the reasoning proposed by their discussion partners to their own reasoning, as opposed to making isolated assertions. In this sense, Tegos et al.’s (2016) proposal that sequencing should be examined over a whole item of interaction as opposed to just two or three lines of transcript, is adopted in the present study.

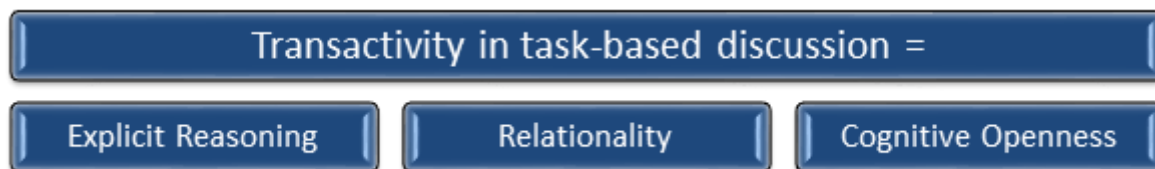
In their prolific work on group interaction, Stahl (2006, 2009, 2011) defines the concept of transactivity as a property of conversation which requires that a contribution contains both an explicit reasoning display and an acknowledgement of a previous explicit reasoning display from another interactant. For Stahl and Rosé (2011, p. 518), explicit reasoning is the act of making a statement or premise

known to a partner. Sionti et al. (2012) concur that explicit reasoning is a prerequisite for dialogic transactivity. This dual definition of transactivity is recurrent in the field, with some variation of emphasis on each aspect. For example, Noroozi et al. (2013) describe transactivity as the practice of partners using each other as resources in the learning process, by referring to and building on each other's reasoning.

Another central theme in the present study is cognitive openness, which the present study assumes as a vital component of transactivity. Cognitive openness is defined in the present study as the action of taking a critical and flexible epistemic stance in order to evaluate knowledge claims and develop alternative viewpoints during reasoning interaction (van Heijst et al., 2019, p. 166). Published studies in the field imply the link between cognitive openness and relationality because if a participant demonstrates openness to alternative views presented by others, other speakers will be encouraged to contribute to the conversation (Teasley, 1997, p. 364).

Teasley (1997, p. 362), distilled Berkowitz and Gibbs' (1983) comprehensive theory of transactive interaction down to five ascending levels, from externalisation, where there is no attempt to explain a viewpoint, to conflict-orientated consensus-building, which they argued results in a higher level of engagement and which is therefore the most effective for CKC. Teasley's (1997) taxonomy has been cited by subsequent scholars in the learning sciences, such as Weinberger and Fischer (2006) or Sionti et al. (2012). Of particular relevance to the present study is Teasley's (1997) notion that new ideas are more likely to emerge if there is conflict in learner interaction. Section 2.4.2 of this chapter considers whether instances of challenge from one speaker to another may constitute a potential trigger for extended dialogue and for the possible development of CKC.

In the present study therefore, transactive interaction is understood to comprise the explicit expression of reasoning, relationality between speakers, and cognitive openness. How these aspects interplay with one another is explored in the study. Figure 2.1 presents the three dimensions of transactivity in task-based discussion.



**Figure 2-1 Transactivity in task-based discussion**

Although in some studies in the field, reasoning statements and relationality are considered together as one combined notion (Fiacco & Rosé, 2018), in the present study the approach taken was to examine how the three dimensions function as singular constructs, before looking at how they function holistically. Thus, research question 1 is divided into sub questions 1a, 1b and 1c to gain insights about each dimension, as well as question 1d which creates the scope to probe the interplay between the dimensions.

### **2.2.1 Explicit Reasoning**

Howley et al. (2013a, p. 209) explain that although the term ‘reasoning’ can vary in different subject domains, the basic process is usually the same when students are working on a given task in a team, as they vocally engage with information to help them solve the problem or reach understanding. Such a process amounts to the function of explanation, which according to Ploetzner et al. (1999) is a social action which allows understanding to be operationalised. The use of meta-textual features (Carter & McCarthy, 2006, p. 262) such as the framing device “for example” or “for instance” is a way for speakers to illustrate their claims effectively to other learners in the group. Not only does such metalanguage make reasoning more explicit, it also fosters engagement of other participants (Dillenbourg & Jermann, 2007).

Indicators of consequence used in explanatory discourse, such as the causal phrases “because”, “cause”, “so”, and “since” (Chi et al., 1989, p. 50), have been recognised in the literature as mechanisms which can help justify points and therefore make reasoning more explicit. It should be noted that the reference to the use of “so” in Chi et al.’s study (1989) is that of the resultative linking adjunct (Carter & McCarthy, 2006, p. 258), as opposed to the discourse marker “so”, which is associated with openings or closings within spoken interaction (Carter &

McCarthy, 2006, p. 214). The present study considers causal phrases in relation to explicit reasoning.

Framing structures such as “you are saying” serve to reformulate a point. Such structures are described by Waring in their work on substantive reciprocity (2002, p. 458) as having a relational function in that they directly implicate other speakers, but they also have the function of increasing explicitness by elucidating a point made by another speaker.

### **2.2.2 Relationality**

Heritage and Atkinson (1984) consider relationality as instrumental for meaning-making for successful argumentation. As Suthers et al. (2010) explain, uptake from one speaker to another can both add to, or modify prior statements in the interaction and relate to new contributions. Whilst the present study aims to understand how visible linguistic features and turn-taking patterns may invoke transactive interaction (Weinberger & Fischer, 2006), it must also address the premise that reasoning is not always overt (Fiacco and Rosé, 2018). A reasoning statement may link to a prior statement in the dialogue not only through the use of a linguistic feature such as a causal mechanism, pronoun or deictic expression, but implicitly, by referring to an idea which has already been raised in the discourse (Fiacco & Rosé, 2018). Stahl (2006, p. 444) explores how students use particular linguistic structures such as ellipsis to link to previous ideas and therefore to help form collective understanding in a math’s lesson.

According to Stahl and Rosé (2011, p. 540), the mention by speakers of shared references such as the course materials or a quote from the teacher, creates connections among participants’ utterances, and increases relationality. Ludvigsen (2016, p. 116) makes a similar claim; proposing the use of shared tools as a medium which can foster shared knowledge by bridging the gap between individual and collective processes. Furthermore, Dillenbourg and Jermann (2007) found that the use of mutual explicit references among learning partners increases relationality and is a decisive element for the success of students’ collaboration. Damşa et al. (2013, p. 101) explain how linguistic features may facilitate this type of reference bonding, providing the example of the use of the third person

pronoun in reporting structures to refer to a task item or text being discussed by the group.

Linguistic structures which demonstrate orientation towards other participants produce more likelihood of follow-up (Jeong 2006; van Heijst et al., 2019, p. 181). First name vocatives can increase group cohesion according to Persico and Pozzi (2010, p. 2613) direct personal subject pronouns and reporting structures are examples of such relational language. According to Carter and McCarthy (2006, p. 821) reporting structures such as ‘as X said...’ also enable speakers to backchannel on others by repeating or returning to a point made previously.

The pronoun “we” is regarded as indicative of relationality in the present study because it indicates participants’ account of a shared knowledge building process (Roschelle, 1992, p. 260). It may also be a means of increasing explicitness by providing a recap of the steps or thought process followed by participants in a collective group learning event.

### **2.2.3 Cognitive openness**

According to claims made in many of the key sources underpinning the present study, cognitive openness may be conveyed with the help of linguistic structures which indicate the notions of uncertainty, possibility and tentativeness.

Expressing uncertainty is treated with significance in the present study because it contributes to the open space needed to explore ideas in the knowledge building process (Jordan et al. 2012, p. 685). According to van Heijst et al. (2019, p. 169), the expression of uncertainty, possibility and tentativeness leads to the contribution of points by others and therefore to the prolongation of interaction between learners. If assertions are framed in such a way as to acknowledge that other participants may or may not agree, it sets up the claim for negotiation (Rosé, 2013, p. 246). Similarly, speakers may use explicit language to express their lack of understanding of a topic or of another speaker’s point. According to Lindwall and Lymer (2011, in Koschmann, 2013, p. 156), in their work on students’ use of the lexis “understand” when working on group tasks in the science classroom, admission of failure to understand may be treated by co-participants as a prompt to provide further explanation of a point.

Weinberger and Fischer (2006, p. 85) posit that by using linguistic framing structures such as “if” or “maybe” to precede a claim, an interactant qualifies the claim as being dependent on another independent attribute and therefore opens the scope of the claim. Howley et al. (2013b, p. 193) borrow from the terminology introduced by Martin and White (2005, p. 102) in their Heteroglossia framework, to demonstrate the distinction between monoglossic assertions which contain no hedged language and leave no room for questioning, and heteroglossic ones, where the recognition of alternative possibilities is explicitly acknowledged by the use of the conditional tense with the auxiliary verb “would”. Similarly, Schwarz and Baker (2017, p. 162) propose the use of the adverbial “perhaps” as a manner of expressing hypothetical propositions. They claim that the use of such hedging phrases communicates openness to alternative views (Schwarz & Baker 2017, p. 180), which fosters collaborative argumentation.

Cognitive openness in learner interaction can be conveyed through prosody as well as through lexico-grammatical features. Rising intonation positions a notion as questionable, and therefore not definitive (Bartlett, 2012, p. 116). Similarly, Roschelle (1992, in Koschmann, 2013, p. 156), comments on a speaker’s use of upwards prosody in an opening turn, which they say encourages a response from partner speakers. Brown (2015, p. 421), supports this claim, stating that high pitch at the end of an utterance is likely to indicate uncertainty and encourage feedback from other speakers, as opposed to low pitch which conveys the notion of completion.

Questions, which are typically associated with upwards prosodic shift, naturally contribute to openness in dialogue as is discussed by Schegloff (1985). As well as the sense of invitation implied by the upwards prosodic shift which characterises many questions, a question usually implies the need for an answer. Schegloff (1985, p. 33-34) explains this phenomenon by virtue of the adjacency-pair format of question response patterns, whereby the first pair part (FPP) of the interaction determines the second pair part (SPP).

It is claimed in the literature that as well as contributing to openness, the use of questions by speakers may contribute to explicit reasoning and relationality in learner interaction. Schegloff (1985, p. 33), posits that if one interactant employs a question, this can lead to a reasoning display from a partner speaker. Howley et

al. (2013a., p. 208-209) claim that when contextualised, a direct question posed by a speaker as a way of checking understanding may count as reasoning discourse but also as relationality since the onus is placed on co-participants to contribute to the dialogue. Similarly, Littleton and Mercer (2013, p. 16) explain that the reasoning process could be accounted for through evidence of critical, constructive engagement whereby participants widen themes by posing and responding to direct questions. The advocacy of critical questioning not only has implications for student agency (Schwartz, 1999) but strengthens the argument for dialogic interaction, where learners need to be actively involved in processing, creating and shaping knowledge (Basturkmen, 2016, p. 155) in group situations. Rhetorical questions can be used to inform rather than request information (Koshik, 2005, in Koschmann, 2013, p. 156) and the openness conveyed in the upwards shift serves as a frame for engagement of other speakers.

In summary, the present study will be alert at the data analysis stage to the presence in the dataset of linguistic items which can be linked to transactivity. This includes both linguistic items identified in previous studies, as documented in Table 2-1, and others which emerge in the course of the data analysis conducted in the present study. Emergent linguistic features will be noted in chapter 4 and discussed in chapter 5.

**Table 2-1 Linguistic features associated with each dimension of transactivity**

Linguistic Feature and reference in thesis	Transactive dimension		
	EXPLICIT REASONING = EXP		
	RELATIONALITY = REL		
	COGNITIVE OPENNESS = OP		
Chapter 2, 2.2.1 - The use of a meta-textual clause such as ‘for example’ (Carter & McCarthy, 2006, p. 262) for exemplification (Dillenbourg & Jermann, 2007).	EXP	-	-
Chapter 2, 2.2.1 - Causal mechanisms to explain reasoning (Chi et al., 1989, p. 50)	EXP	-	-

Chapter 2, 2.2.1 - Indicators of consequence such as the resultative linking adjunct (Carter & McCarthy, 2006, p. 258) “so” (meaning “therefore”) to frame explanatory discourse.	EXP		
Chapter 2, 2.2.1 - Reformulation of points by framing claims with the use of personal pronouns such as “you are saying”, “we said”, “you mean...”. This helps crystallise the essence of the point and relates to others (Waring, 2002).	EXP	REL	-
Chapter 2, 2.2.2 - Ellipsis and deixis, to refer to a shared source or reference (Stahl, 2006, p. 444; Damşa et al., 2013, p. 101; Stahl and Rosé, 2011, p. 540). Sometimes conveyed by “it”.	EXP	REL	
Chapter 2, 2.2.2 - Addressing other group members by using the first name vocative (Persico et al., 2010, p. 2613) heightens involvement of co-participants.	-	REL	-
Chapter 2, 2.2.2 - Reporting structures such as ‘as X said...’ can elucidate rationale by anchoring a point to a shared reference but also embody relationality by invoking other participants (Carter and McCarthy, 2006, p. 821).	EXP	REL	-
Chapter 2, 2.2.2 - The pronoun ‘we’ indicates the stages of participants’ shared knowledge building process (Roschelle, 1992, p. 260).	EXP	REL	-
Chapter 2, 2.2.3 - Framing structures using hedging such as “I would say that...” convey openness when used to make suggestions, Howley et al. (2013a, p. 209).	-	-	OP
Chapter 2, 2.2.3 - Admission of failure to understand	-	-	OP

Lindwall and Lymer (2011, in Koschmann, 2013, p. 156)			
Chapter 2, 2.2.3 - The use of “if” to qualify a claim for hypothesis (Weinberger & Fischer, 2006, p. 85).	-	-	OP
Chapter 2, 2.2.3 - The use of hedging structures such as “perhaps...” conveys the recognition of alternative possibilities (Schwarz & Baker, 2017, p. 162).	-	-	OP
Chapter 2, 2.2.3 - Upwards prosodic shift conveys uncertainty and invites response from other group members (Roschelle, 1992; Koschmann, 2013, p. 156).	-	-	OP
Chapter 2, 2.2.3 - The use of questions to check understanding (Howley et al., 2013a, 208-209). - Direct questions. (Littleton and Mercer, 2013, p. 16). - Rhetorical questions (Koshik, 2005).	EXP	REL	OP

## 2.3 Collective knowledge construction

In order to probe how transactivity affects knowledge construction in group settings, it is first necessary to define what is meant by knowledge construction in the present study. According to Hatano (1993), students contribute different pieces of knowledge and build on others’ explanations to jointly create a complete idea or solution. In the task used for data collection in the present study, participants have the chance to contribute knowledge and build on others’ explanations as they discuss suitable steps and approaches for writing a summary paragraph of an academic article. For example, task statement 4 requires groups to decide whether it is better to paraphrase instead of using direct quotations when writing a summary paragraph.

Rather than a model of knowledge as a collection of pre-existing individual opinions which cause group reactions, the present study assumes knowledge as an emergent interactional construct derived of group interactions (Stahl, 2009, p. 1). It is through verbal engagement with others that speakers mutually influence, negate, and promote each other, contributing to the iterative process which

foments the development of knowledge in group settings (Negueruela-Azarola et al., 2015, p. 233). These fundamental premises are supported by the notion that oracy is not a subject, but rather it is a condition of learning in all subjects (MacLure et al., 1988, p. 25), as the medium through which group knowledge construction may take place if learning objectives are shared. CKC is therefore primarily a linguistic process which centres on interactions taking place among peers (Stahl et al., 2014, p. 120).

The basic principle of speaking as a social act which affects learning was fortified in the latter half of the twentieth century with studies such as Halliday's work into child language development. Halliday claimed that social interaction is the driver of learning (Halliday, 1975, p. 27), because it implies a continuous exchange of meaning between self and others so that speaking and learning are social acts, just as meanings are social processes (Halliday, 1975, p. 139, in MacLure et al., 1988, p. 27). The fact that such action requires effort from participants, implies the relevance of agency in the process of CKC.

The impact of agency on participative action (Ness et al., 2015, p. 38) is therefore an underlying aspect of CKC, and is found to be a recurrent theme in the literature of the learning sciences. Agency is associated with aspects of CKC such as knowledge creation discourse or the reformulation of phrases which takes place when speakers try to convince others of their view. Epistemic agency describes situations where participants consistently show deliberate and productive participation when engaged in activities involving knowledge and knowing (Scardamalia & Bereiter, 2003). It involves learners taking responsibility for the advancement of knowledge building (Scardamalia, 2002). When epistemic agency is active, learners share and relate to each other's ideas. Before proceeding to discuss further aspects of CKC, it is important to explain how in the present study, CKC is distinguished from the notion of understanding.

### **2.3.1 Collective knowledge construction vs understanding**

Understanding is sometimes proposed as being synonymous with knowledge construction. However, in the present study the two concepts are construed as being inter-related but not identical. This study relies on literature which routinely uses the term 'understanding' in relation to studies of learner

interaction. Koschmann (2011) is one example. Indeed, the notion of understanding in mutual learning situations is often an integral part of the collective development of the learners. However, the use of the word 'understanding' does not always entail growth, and since this study is about construction of knowledge, the notion of understanding alone is not sufficient to encompass the central theme of this thesis. Therefore, the notion of understanding as a concept of recognition of what another participant says, is pertinent to the present study, but it is only part of the issue here, where knowledge construction implies the emergence of something new. In essence, the present study encompasses the notion that understanding may affect knowledge construction, rather than the inversion of this.

### **2.3.2 Collective knowledge construction as a social act**

The notion of learning as a social act has driven scholarship in the learning sciences over recent decades, as is reflected in published studies into aspects of peer-to-peer interaction and collaborative learning. According to Webb (2013, p. 21), learning through group discussion may heighten the opportunity for knowledge construction because peers adapt their language to accommodate each other, tune into each other's misunderstandings and provide more relevant explanations than a teacher would. Webb (2013, p. 21) distinguishes three perspectives of how learning occurs in collaborative groups: the Piagetian-based sociocognitive theory posits that individuals work internally to process information gained during peer activities; whilst the sociocultural theory extolled by Vygotsky (1978) claims that participants imbue information from more knowledgeable peers. The socio-constructivist view proposes that groups generate knowledge by arranging and developing information contributed by different members (Webb, 2013, p 21). Given that individuals and collectives participate in different forms of learning simultaneously (Suthers, 2013, p. 290), the present study accepts the validity of all three perspectives, but due to its emphasis on CKC, is more securely positioned on the socio-constructivist plane. With participants working in groups but dispersed over different geographical locations, the present study of online simultaneous interaction addresses the question posed by Suthers (2006, from Salomon, 1993) of how learning occurs as a social phenomenon even when the participants are not united in one space.

According to Howley et al. (2013b, p. 186), instrumental scholarship in the learning sciences in the late twentieth century such as Lave (1993), embraced the social side of learning, but were still predominantly centred on the individual's role within the community shared space, and the notion of how each learner's knowledge could be deepened therein. In the 21<sup>st</sup> century there has been more attention to the group in studies within the learning sciences (Stahl, 2009), with investigation of a range of concepts such as the effect of social and relational aspects on learning interaction (Damşa et al., 2013, p. 98. Ness & Riese, 2015), or conceptual change (Vosniadou, 2013). Group talk is central to the present study and the focus is on how knowledge emerges through this dynamic, because although group talk is a collation of utterances by individual speakers, the fact that these voices are constantly intersecting (Vosniadou, 2008, p. 24), has an unpredictable and fluctuating impact on the outcomes of the shared learning experience.

Cress and Kimmerle (2008, p. 109) claim that although the social and cognitive systems involved in collaborative knowledge building operate separately, they are also interconnected in that they influence each other and develop together into more complex systems over time. They also state that there would be no communication without cognition. Similarly, Mercer et al. (2019, p. 188) combine the two camps of individual and social, saying that from a sociocultural perspective, knowledge is not only possessed individually but also created by and shared amongst members of communities.

Importantly for the present study, both constructivist and cognitivist-based theories depend on learners interacting in some way to pick up on each other's views or actions. Fiore et al. (2008; 2010) propose coordinated interactions between individual knowledge building and group knowledge building processes. Whilst individual knowledge building includes individual information gathering, information synthesis, and the development of knowledge products; team knowledge building includes knowledge sharing, solution generation, team evaluation, negotiation, planning and regulation (Graesser et al., 2018, p. 68).

For Borge and Rosé (2021), learning takes place on a scale between cognitive and social action, with socio-constructivism entailing peer interaction, where learning occurs through processes, patterns, and the act of doing something with others.

In other words, learners form communities of practice (Lave & Wenger 1991; Rogoff et al. 1995), with shared materials and aims. In such situations, the linguistic dimension forms the basis of learners' mutual communication, so learning potential is dependent on it.

### **2.3.3 Collective knowledge construction as a linguistic process**

The core function of language in learning (Mercer et al., 2019), and the notion of “*linguaging*” as a continual process rather than a finished product (Swain, 2006), underpins the present study. Resonating with the notion of learning as a continual process, Trausan-Matu et al. (2021, p. 222), cite Linell (2009) to state that knowledge is not understood as fixed, but that it emerges through dialogue.

This section explores the view that learning is an interaction-bound ongoing process, which develops gradually in stages (Van Aalst, 2009). In line with this, the study follows a process-orientated account of how people actually construct knowledge together (Dillenbourg & Jermann, 2007), through an analysis of observable spoken interaction (Stahl & Rosé, 2011). Paulus and Wise (2019) concur on the issues of process and observability. They stress the progressive tendency in CSCL, to focus on process rather than on outcomes, and recommend that any study of interaction should establish and maintain a focus on the process of reasoning by rendering this visible through the recognition of linguistic features pertaining to the development of the interaction (Mercer et al., 2019, p. 187). Adding to the notion of a continual evolution of meaning, Damşa et al. (2013, p. 98), propose a scale of levels of depth of assimilation of knowledge, as opposed to a binary view.

Similarly, Enyedy et al. (2014) posit that knowledge is gradually, progressively and collectively built through a sequence of utterances by different speakers (Bereiter, 2002, p. 283, van Aalst & Chan, 2007). Therefore, as is claimed by van Aalst (2009, p. 260), knowledge construction is an emergent and dynamic process, which relies on peer-to-peer interaction embodying actions such as the probing of explanations, or interpreting and evaluating new data. These effort-filled actions depend on agency (Baker et al., 1999, p. 31) to activate higher levels of processing such as syntheses of theories or hypotheses of existing and new ideas. It is through the process of engagement with others in the interaction, that learners in task-

based group situations mutually build on each other's contributions (Howley et al., 2013b, p. 186) and the group can gain new insights and increase the potential to build knowledge together (van Aalst, 2009, p. 260).

Kuhn and Udell (2003) claim that engaging in peer dialogues increases student ability to produce high quality argumentation. The theory that by participating in reasoned argumentation, students at different stages of education will improve their thinking skills (Ravenscroft and McAlister, 2008, in Sionti et al. 2012, p. 34), has a high relevance for the contemporary higher education classroom, where critical thinking is emphasised as a necessary attribute. While arguments can sometimes be presented through other communicative modes such as the use of mathematical notation, and by physical demonstration in science or music, language is essentially involved in all subjects (Mercer et al., 2019), and the situated learning which enables people to join communities of practice almost always has a linguistic dimension (Lave & Wenger, 1991, in Mercer et al., 2019, p. 189). In other words, it is through speaking together that intersubjectivity can come into focus, as participants in a learning group discover the knowledge held in each other's minds, and combine this with current knowledge to engage effectively in the development of a given topic.

### **2.3.3.1 The intersubjective nature of collective knowledge construction**

Proposing that knowledge should be seen as a socially accomplished practice, Suthers (2006, p. 321) places the notion of intersubjectivity at the core of group task work because it embodies the applied effort made by participants to understand each other during a task. The ongoing nature of human knowledge construction implies that intersubjective meaning-making is an endless work in progress, constantly refined and reassessed (Schwarz & Baker, 2017, p. 162). Similarly, Sawyer (2013, p. 126) claims that the construction and maintenance of intersubjectivity is central to successful group collaboration, and that the agency and openness implied in intersubjective interaction applies not only to a participant's productive output but also to their role as a receiver. Wells (1981, p. 54) suggests that there is a triangular relationship between sender, receiver and the field of intersubjective attention.

Schwarz and Baker (2017, p. 162) claim that in spoken communication the intersubjective dimension opens a topic out to be collectively contemplated through alternative discourses in group interaction. Therefore, as with dialogism, the notion of intersubjectivity is embodied in transactivity theory because it depends on and is affected by how participants operate on each other's turns in the interaction (Kimmerle et al., 2021). As well as relationality, the other dimensions of transactivity defined in the present study: explicit reasoning and cognitive openness, affect intersubjectivity. By expressing points explicitly and using shared references, the former helps other group members understand the line of discussion, whilst cognitive openness encourages critical engagement with ideas of others which a participant may not agree with.

Maclure et al. (1988, p. 107) claim that intersubjectivity of understanding is crucial for joint efforts at task work to be productive. Furthermore, CKC occurs when community members engage in intersubjective stance-taking (Hyland, 2005; Martin & White 2005; du Bois 2007). According to du Bois (2007, p. 139), an intersubjective stance is viewed as a public dialogical act consisting of three simultaneous activities: evaluating knowledge claims, positioning the self, and aligning with the other(s). Like dialogism, the intersubjective stance relies on openness to other's ideas. Suthers et al. (2013, p. 4) take the term multivocal from Bakhtin (1981), who used it to describe the multifaceted character of conversations, where different voices can co-exist without necessarily reaching consensus (Skidmore & Murakami 2012).

Schwarz and Baker's (2017, p. 162) explanation of intersubjectivity in group talk, namely that it is linked to openness to alternative discourses originating in others, coincides with the emphasis on the awareness and acceptance of alternative arguments in dialogism (Bakhtin, 1984). The concept of dialogism is associated with openness and flux of meaning in the literature of the learning sciences. Van Heijst et al. (2019, p. 169) describe the dialogical approach to the construction of knowledge as an intermental process, where new insights emerge from a multivocal dialogue. Such a dynamic setting is reliant on openness to others' views (Wegerif, 2019). The notion that it is the consideration and uptake on peer voices that leads to the generation of new ideas (Schwarz & Baker, 2017, p. 162) implies the premise established in the dialogical approach, that discussion should incorporate several available voices (Baker 2015, p. 176), and acknowledge the

existence of alternative arguments (Bakhtin, 1984). This aspect of dialogic speech has infinite potential for creativity (Wegerif, 2007) and collective knowledge building, and it is this generative and multi-dimensional view of talk which is relevant to the present study (Ouyang et al., 2022).

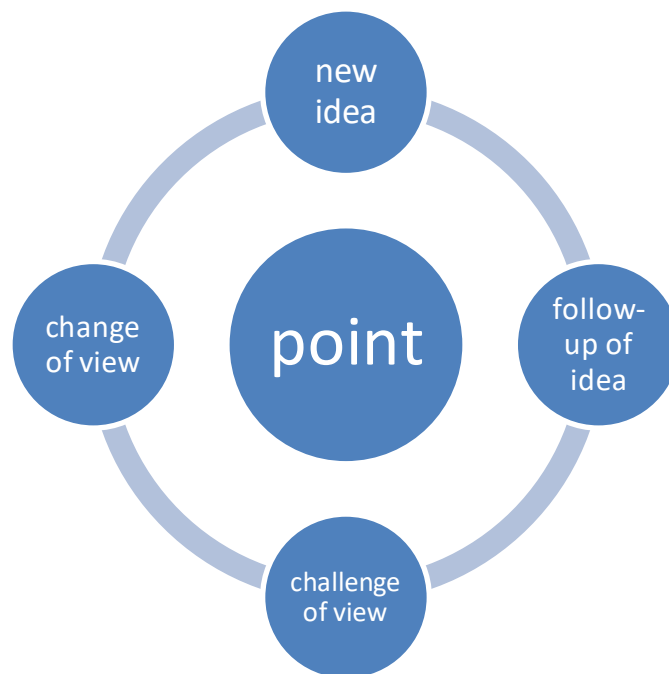
### **2.3.3.2 The link between intersubjectivity, the joint problem space and interaction**

According to Martin and White (2005) and Hyland (2005), when working in groups, learners may adopt an intersubjective stance if they act within a joint problem space (JPS). In their work about the construction and effect of a JPS in learning contexts, Teasley and Roschelle (1993, p. 254) posited that it is the establishment and maintenance of a shared conception of the problem throughout a task that distinguishes a JPS from simple problem-solving which could be primarily driven by individual mental states (Sarmiento-Klapper (2009, p. 85) and which was not dependent on participant interaction. Referring to the work of Teasley and Roschelle (1993), Sarmiento-Klapper (2009, p. 86) explains that a JPS is dependent on common understanding among participants in group learning situations and that this is affected by interactional turn-taking (Roschelle, 1992, in Sarmiento-Klapper, 2009, p. 86) and sequential aspects (Sarmiento-Klapper, 2009, p. 91) as learners build upon past actions, current situations and future applications of their group experience. For Sarmiento-Klapper (2009, p. 83), these actions have the potential to contribute to the collective act of knowledge building. The linguistic features highlighted in chapter 2, section 2.2.2 as pertinent to the transactive dimension of relationality, have a particular significance for the study of intersubjectivity and the notion of the JPS. For example, the use of deictic or elliptic features may serve to help speakers make reference to common ground or maintain joint focus in group interaction.

## **2.4 Indicators of collective knowledge construction**

The present study aims to explore whether transactive interaction is the gateway to CKC. It does this by locating and examining indicators associated with CKC in the group interaction. These indicators are: change in speakers' views (Schwarz & Baker, 2017); challenge from one speaker to another (Wegerif et al., 2010); the emergence of new idea in the interaction (van Aalst, 2009); and follow-up of others' ideas (van Heijst et al., 2019).

In the field, these four notions are often synthesised in the discussion of CKC. For example, Teasley (1997) claims that both change of a speaker's own view and the expression of challenge to another speaker's view lead to the expression of new arguments to support a position (Teasley,1997). For van Aalst (2009, p. 262), knowledge construction emerges from changes in a person's thinking about context-specific subjects. The co-relation between both change and challenge of views and the emergence of something new, such as a different idea, nuance, or alternative perspective of a topic is a significant premise for the present investigation. Based on existing studies, the present study is underpinned by the view that CKC is a cycle which is dependent on speakers developing ideas which are contributed by others, irrespectively of whether they agree with these ideas (Ouyang et al., 2014, p. 14). In some cases change of a speaker's own view may occur.



**Figure 2-2 The cycle of Collective Knowledge Construction**

### **2.4.1 Change of a speaker's own view**

Schwarz and Baker (2017, p. 163) posit that knowledge building through speaking involves more than defending one's stance; it implies changes in viewpoint. For the purposes of the present study, indications of such moves may be explicit phrases where a speaker declares that they have changed their view, Change of a

speaker's view can also be more tacit, involving subtle shifts in the content of their turns.

Schwarz and Baker (2017, p. 165-166) relate the notion of appropriation of others' views to change of view, emphasising that these concepts operate through a gradual process and involves the extent to which there is mutual influence or interpenetration between individuals' points of view. Schwarz and Baker (2017, p. 163) relate this process to intersubjectivity, pointing out that although change happens egocentrically, it is often triggered by the acquisition of beliefs, attitudes and values from others in group interaction. Furthermore, such change is also related to dialogism (Schwarz & Baker, 2017, p. 166) as it requires the open discussion of alternative options and interpretations, through which rationale for different points of view may emerge.

Some scholarship links change directly to learning, for example, Melander (2012) proposes that analysts track changes in knowledge claims in group interaction as the indicator of cognitive progress. Heritage (2013, p. 370) suggests that such analysis should be based on finding changes in viewpoints of speakers over several turns, a notion that will be accounted for in the present study through the attention given to sequencing over whole task items in the dataset.

### **2.4.2 Challenge of another speaker's view**

The present study is interested in assessing what happens when students disagree with or challenge others, especially to discover if this can be related to the emergence of new idea.

In contrast to the claim that convergence of position is necessary for effective collaboration (Roschelle, 1992), others claim that it is conflict-orientated discussion that results in deeper engagement by interactants, and this potentially fosters knowledge construction. Azmitia and Montgomery (1993) recognised that socio-cognitive conflict expressed through transactive dimensions may foster creative solutions and thus enhance CKC. Likewise, Teasley (1997, p. 362) claims that by facing critique, learners need to point out specific aspects of peers' contributions and present alternatives to them, which may invoke new idea. When speakers pose challenge to others, they are more likely to use creative discourse

including the introduction of new perspectives on a topic to convince others in the group of their argument (van Aalst, 2009, p. 262). Similarly, Ziegler et al. (2006, p. 316) link the expression of conflict to the prolongation of interaction and the potential for more knowledge building to take place. Von Aufschnaiter et al. (2008) also claim that knowledge construction emerges from arguments where several rebuttals and challenges are incorporated.

Shirouzu (2013) considers the psycho-cognitive aspects that lead to change in group knowledge construction, claiming that divergence of thought between speakers forces collaborative conceptual change. According to Shirouzu (2013), divergence or challenge to viewpoint motivates participants to produce persuasive explanations of their thought. Weiss & Dillenbourg, (1999, p. 17) agree, positing that the additional cognitive effort required to continuously detect and repair mutual understanding may present an opportunity for learning. Similarly, Tegos et al. (2015) stress that the effort required to consistently detect and repair misunderstanding, when learners are engaged in the process of conflict resolution (Wegerif et al., 2010) has beneficial outcomes for learners. Schwartz (1999, p. 17) claims that it is in the attempt to rectify misunderstandings where a great deal of learning can occur, because the act of reformulating a premise can lead to a more developed understanding. Roschelle's (1992, p. 256) analysis of student-to-student interaction demonstrated through an emphasis on sequencing, that repair can be used as a means of constructing mutual understanding, as dyads repair and reconstruct a problem.

### **2.4.3 The emergence of new idea via knowledge creation discourse**

Borge and Rosé (2021) refer to extensive work in the field of CSCL to highlight the difference between knowledge sharing and knowledge creation discourse types within collaborative learning interaction. They state that knowledge sharing discourse has less implications for the idea of something new emerging in the interaction, since it is associated with the description of a problem. When learners go beyond descriptive discourse and enter into the conceptual domain, they produce the discursive actions of summarizing, rephrasing, and discussing theoretical concepts and principles (Weinberger & Fischer, 2006, p. 75). The

cognitive effort and agency required to communicate at this higher level has more potential to lead to CKC.

The present study assumes the existence of different levels of knowledge building discourse. For example, Howley et al., (2013b, p. 187) make a distinction between knowledge sharing, knowledge integration, and knowledge creation. Speakers may propose new arguments to convince others of their views but also contribute new ideas to elaborate their points. These new ideas may comprise notions which are more or less abstract, which increment the discussion by adding nuance, dimension or alternative interpretations, and which may refer to shared objects (Paavola et al., 2005, p. 539; Stahl, 2012).

According to van Aalst (2009, p. 262), knowledge creation discourse involves a higher level of intellectual effort by community members than knowledge sharing (i.e., merely presenting pieces of knowledge) or knowledge construction (i.e. bringing together established knowledge in the domain). For van Aalst (2009, p. 261), higher-level processing involves some indication of new idea, which may emerge through new formulations of problems. Van Aalst (2009, p. 262) relates higher level processing to epistemic agency, which they associate with knowledge creation discourse.

Ouyang et al. (2022, p. 14) also stress the pertinence of higher level discourse, which they refer to as “deep level discourse”, for collective knowledge construction. For Ouyang et al. (2022) there are three categories of learner discourse: higher level discourse leads to the construction of new ideas; whilst medium level may lead to extension of interaction but does not embody the emergence of new idea. The lowest level is described as “superficial” and involves mere repetition of others’ ideas without elaboration (Ouyang et al., 2022, p. 14).

Scardamalia (2002) advocates the constructive use of authoritative sources. Community members should adopt a “design thinking” mindset (Scardamalia & Bereiter, 2014, p. 7), in which taking knowledge for granted is replaced by a joint effort to critically question established knowledge, adopt an open attitude towards new ideas and reach a thorough understanding by the meaning-making process which evolves in the discourse (de Jong 2015).

#### **2.4.4 The follow-up of idea via knowledge creation discourse**

Knowledge creation discourse also determines how existing ideas are elaborated during the group discussion (Scardamalia & Bereiter, 2014, p. 6). According to Waring (2002, p. 456), reformulation of existing ideas helps crystallise the essence of the point and implies an extension of dialogue which allows the chance to co-develop an explanation whilst maintaining continuity. The alternative expression and possible use of discipline-specific language by a partner speaker may even help a prior speaker elucidate their thought, which may contribute to CKC (Waring, 2002, p. 456). In learning interaction the primary goal is to develop understanding (Waring, 2002), and as is discussed in chapter 2, section 2.2.1, framing structures such as “you are saying”, may be effective for framing the reformulation of points.

Reformulation is a form of intersubjective meaning-making (Lund et al., 2013, p. 24). According to Lund et al. (2013, p. 24), such processes require the activation of agency in speakers for them to embark on and complete the process of interpreting and re-wording aspects of prior contributions of fellow participants with alternative language. Not only is such reformulation dependent on understanding other speakers’ words, but understanding others’ thought (Vygotsky 1962, p. 151, in Wells et al., 1981) is necessary if they are to proceed and develop the interaction. In some cases, reformulation of a point may emerge in response to a speaker’s overt admission that they do not understand (Koschmann, 2013, p. 156) (see section 2.2.3).

#### **2.4.5 Not just talking, but how to talk in groups**

The keystones of effective peer discussion are not only what learners are talking about but *how* they talk (Tegos et al., 2015, p. 310) and this is not just a matter of the intensity of speakers’ effort to be vocal in group interaction. Group cognition is a complex and multi-layered construct (Stahl, 2009, p. 11; Suthers, 2013, p. 290) which requires group task discussion to be conceptualised as a joint and developing project to which members contribute with spoken output which is transactive (Schwarz & Baker, 2017).

The view of CKC as being participatory, creative and co-constructed through dialogue implies the activation of agency to ensure strong engagement levels of

participants (Haneda & Wells, 2013). Basturkmen (2016, p. 159) explored how EAP students co-construct ideas and information through dialogic interaction. In a previous study into patterns of interaction among EAP students, Basturkmen (2003, p. 28) showed that as opposed to simple exchanges of pre-formed ideas, more complex exchanges invoked the emergence of new idea through negotiation.

If learners collaboratively build knowledge by acknowledging, clarifying, correcting, adding to, and connecting to each other's ideas (Webb, 2013, p. 21), this requires intersubjective engagement and creative discourse (Damşa et al., 2010, p. 152). The effectiveness of this depends on how much participants take others' ideas into account and co-construct knowledge with others (Damşa et al., 2013, p. 98). For example, Cacciamani et al. (2012) found that higher participation of group members is associated with a more critical evaluation of the knowledge itself. In other words, epistemic agency is key to the generation and advancement of ideas in learning settings (Damşa et al. (2010, p. 149).

Over recent decades, studies have presented models of types of talk, such as the work by Mercer (1995, p. 104) which identified *exploratory* talk as open and constructivist, and *disputational* talk as dominated by divergence of views and *cumulative* talk, which entailed uncritical joint knowledge-sharing (Paulus, 2005). Of these three types, *exploratory* talk (Mercer, 1995, p. 158) best encompasses the values of transactivity. First, *exploratory* talk requires reasoning to be visible (Mercer, 1995) which resonates with more recent educational projects on the value of visible thinking (Ritchhart et al., 2011). Second, it involves active participation through speakers asking and answering each other's questions, and the sharing of relevant information.

Tan's (2003) study applied the construct of exploratory talk to learning in English as a foreign language (EFL) settings, although the teacher-led nature of the learning distinguishes the data from the autonomous peer-to-peer dialogue of the present study. Tan (2003, p. 63) found exploratory talk to be productive for the development of joint construction of knowledge in communicative tasks in L2 group discussions as it helped learners construct ideas and develop their thinking. Tan (2003, p. 63) illustrates how by posing questions during a group task, speakers could lead to the joint exploration of a language issue.

Exploratory talk and mutual commitment to engaging with complex ideas are dependent on the extension of talk. Change of one's own view and challenge of others' views may be implicit or explicit in such extended interaction but the present study is based on the premise that the main driver of CKC is the generation of and development of ideas (Scardamalia & Bereiter, 2014, p. 9) and that this may take place when knowledge creation discourse is invoked.

## **2.5 Transactivity and collective knowledge construction: theory and practice**

Damşa et al. (2013, p. 98) claim that collective knowledge construction during interaction is affected by how much participants refer to each other's ideas. Damşa (2010, p. 176-177) classes relationality as a generative collaborative action because it has the potential to facilitate the emergence of something new as points are taken up and developed by other speakers (Scardamalia, 2002; Okita & Schwartz, 2013, p. 380). As such, the present study is interested in how speakers relate to others and the effect of this on knowledge construction. In their work on transactivity, (Gweon et al., 2013), also highlight the option of self-transacting, whereby a speaker returns to a point they have made previously in the interaction. Both self-orientated transacts and other-orientated ones are considered to be a way of elaborating an idea and are therefore relevant factors in the study of collective knowledge construction (Gweon et al., 2013).

Transactivity is defined as "connected discourse" by Hogan et al. (1999, p. 426), and explained as a process whereby participants acknowledge, build, and elaborate on others' ideas. Transactivity is recognised in the field of the Learning Sciences, as being key to effective learner collaboration (Weinberger et al., 2007) and has been linked to the improvement of learning outcomes (Sionti et al., 2012, Zoethout et al., 2017, p. 208). The fact that transactivity has also been aligned with CKC as a process rather than being linked to an outcome paradigm (Gweon et al., 2013, p. 248; Borge & Rosé, 2021), renders the theory pertinent to higher education settings, where seminar classes involve learner discussions as a means of developing knowledge.

In the case of L2 students, such as the participants in the present study, they must be well-prepared to be able to perform in student-centred learning with high

levels of communicative competence no matter their specific discipline (Hyland, 2012). In EAP curricula, the objective is more about advancing on an upward scale to build one's competence in communicative academic skills; speaking, writing, reading and listening, rather than accumulate ticks in competency check boxes (Hyland, 2012). In the present study the underlying linguistic notion that interaction is an ongoing process (Garcia & Jacobs, 1999; Azmitia & Montgomery, 1993; Uttamchandani & Lester, 2021), combines with the educational one that construction of meaning is progressive rather than pivotal (Roschelle, 1992). Furthermore, in collective domains, this process may be nurtured through extended dialogue (Jonassen & Land, 2012), which is where transactivity may have a direct impact.

### **2.5.1 Explicit Reasoning and collective knowledge construction**

Studies of transactive interaction claim that knowledge construction involves explicit reasoning as well as relationality (Sionti et al., 2012, p. 34; Howley, 2013a, p. 215). Webb (2013, p. 21) states that learners can collaboratively build knowledge by acknowledging, clarifying, correcting, adding to, building upon and connecting to each other's ideas. Tegos et al.'s study (2015) highlight that students should paraphrase each other's utterances, make clear references to sources of support available in the context, and connect points up to others with explicit reasoning.

### **2.5.2 Relationality and collective knowledge construction**

Transactive conversational contributions are viewed as important steps in a knowledge construction process by Weinberger and Fischer (2006). Aligning with Teasley (1997), they state that by forming connections between newly articulated ideas and material contributed earlier, peer participants' ideas can build upon one another, and potentially be developed and transformed. Relationality is contingent on explicit displays of reasoning, so that the first speaker's idea can be known by a partner, who can then act on or build upon this idea (Teasley, 1997; Fiocco & Rosé, 2018). Therefore, reflecting back on what has been said is instrumental for successful argument.

The existence and reference to group common ground in interaction allows meaning to be underspecified by the speaker so that language understanding is a constructive process in which inferencing is to be expected among partner speakers (Allan, 2010, p. 71). Koschmann (2013, p. 158) associates common ground with mutual understanding, and associates both notions with intersubjective communication, since they implicate engagement with the philosophical arena of how humans know what others know. As explained in section 2.2.2, linguistic structures which foster common ground and mutual understanding can be elliptical ones (Stahl, 2006, p. 444), such as the use of the pronoun “it” Koschmann (2013, p. 161), to ensure the ongoing collective focus on an idea, and reinforce the sense of unity in the group.

Shared objects are also associated with knowledge building in collaborative learning settings. Paavola et al. (2005, p. 539) propose that shared objects form a working space for learners to mutually focus on as they develop their understanding through spoken interaction. This notion of mediation aligns with the Vygotskian view of the social and communal nature of human activity (Engestrom, 1987, p. 37-73). According to Wertsch (1993) learners can coincide their foci on a common and objective point within the learning environment. Like Stahl (2006, p. 9), Paavola et al. (2005) state that shared objects may consist of artefacts such as texts, spoken words, theories, sentences, or man-made objects. Paavola et al. (2005) claim that collective knowledge building in groups can be observed in the interplay of physical, linguistic and other behavioural activity that such objects trigger in participants.

Howley et al., (2013a) also highlight the significance of shared objects for collective knowledge construction. Their explanation of a shared object is one which implies the information that students are provided with when working in teams to solve a problem. For Howley et al. (2013a.), such shared objects usually comprise course materials including simple items such as a task statement, as occurs in the present study.

Relationality also implies the prolongation of talk, as speakers pick up and continue a previous contribution by a partner Jeong (2013, p. 174). Even if relationality involves a challenge to another speaker’s view, students usually provide additional information to support their dissent, which results in an

extension of their turn (Ziegler et al., 2014, p. 65). Although the prolongation of the talk is not synonymous with knowledge construction, it is true that moves leading to knowledge construction often imply the prolongation of discourse. Conversely, if a speaker externalises (Teasley, 1997) and offers no explicit reasoning to account for their point of view, their turn will be shorter. This is important for knowledge construction according to van Heijst et al. (2019, p.167), because continuous elaboration results in idea improvement. Similarly, Jeong (2013, p. 176) posits that sustained engagement with incomplete or incorrect ideas is a way for learners to develop knowledge, as opposed to a focus on perfect outcomes.

### **2.5.3 Cognitive openness and collective knowledge construction**

The present study argues that cognitive openness is an important part of CKC in the sense that if participants display interest and tolerance of alternative views during task interaction, they widen the potential for possible solutions or relevant ideas to develop. By creating the scope for the incorporation of different perspectives and viewpoints in the discussion, cognitive openness fosters the development of initial beliefs into more complex and better supported views (Chinn et al., 2011; Howley et al. 2013a).

In other words, cognitive openness may foster CKC since it involves the process of negotiating and interrelating diverse views of group members (Ouyang et al., 2022). This view aligns with the notion that there are epistemic gaps between students' knowledge and the necessary understanding of a topic that learners require to complete a given task (Graesser et al., 1995). This is where the issue of epistemic agency is pertinent to effective knowledge construction, as in order to fill knowledge gaps, students must first become aware of what they do not know through the interactional process (Crook, 2000). This theory implies a knowledge creation process (Scardamalia & Bereiter, 2021), made up of both divergent and convergent sequences. It is the merging of dissonant and similar views which ultimately produces new ideas (Trausan-Matu, 2013), because by facing different viewpoints and challenging them, participants often incorporate something new as an effective way of persuading others and expanding the scope of the discussion, as happens in everyday conversation.

A review of the literature has shown that both tacit and visible aspects of interaction are pertinent to understanding how knowledge is being constructed in group talk. For example, Stahl (2009, p. 8) claims that knowledge is an evolving product of interpersonal meaning-making. On that basis, the present study aims to render salient and consider in the discussion both visible and more tacit aspects of student-to-student task-based spoken interaction. It does this by taking into account tangible features such as the use of lexico-grammatical features to determine whether speakers show evidence of recognising alternative viewpoints (Teasley, 1997, p. 363), which is crucial to the development of new knowledge and understanding (Trausan-Matu et al., 2021, p. 222-223). In other words, dialogism is recognised as being interlinked with the notion of cognitive openness at the centre of the theory of transactivity in the present study.

## **2.6 The Research Questions: overview and rationale**

The Research Questions construed for this study are as follows:

### ***1. How is transactivity shown in small group spoken interaction in task-based learning settings?***

1a. To what degree and how do interactants convey explicit reasoning?

1b. To what degree and how do interactants relate to points made by other speakers?

1c. To what degree and how do interactants manifest cognitive openness in their talk?

1d. How do explicit reasoning, relationality and cognitive openness combine in the interaction?

### ***2. What is the link between transactivity and collective knowledge construction?***

2a. How is collective knowledge construction evidenced in the interaction?

## 2b. How is collective knowledge construction affected by transactivity?

Research question 1 is devised with the purpose of locating and gaining insights into the presence of transactivity in the interaction by sub-dividing the construct into 3 micro research questions: 1a, 1b and 1c. This facilitates an examination of each of the three dimensions of transactivity acknowledged in this chapter: explicit reasoning, relationality and cognitive openness. By placing a lens on each of the three dimensions of transactivity separately, the analysis may reveal which linguistic structures enable each one, and how this happens over whole items of task-based interaction. Question 1d follows up the focus on each of the individual dimensions by asking how they combine in the interaction. It is intended that by considering the dimensions both individually and in synchrony, a fuller understanding of transactivity will be gained and this may provide a natural progression to research question 2.

Research question 2 asks how transactivity affects CKC. This question is divided into two parts, and encompasses the scope for the localisation and examination of the four indicators of CKC as discussed in the present chapter: change of a speaker's own view, challenge of another speaker's view, the emergence of new idea, and development of idea. Research question 2a creates the opportunity to locate the indicators and see how extensively they appear in the interaction. Research question 2b facilitates a probe of these indicators and the language around them in order to discover if and how they are affected by transactivity.

## **2.7 Conversation Analysis: a method to illuminate the dynamics of transactivity and collective knowledge construction**

Stahl and Hakkarainen (2021, p. 32) claim that to analyse collaborative interaction, one must understand the conversational moves and the meaning-making that is taking place within a group of speakers. Uttamchandani & Lester (2021, p. 610) propose CA as a suitable analysis method for collaborative interaction, due to its track record of facilitating investigation into the organization of talk, even if the domain of cognition and learning was not prioritized in early CA work (Koschmann & Schwarz, 2021). Haddington et al.

(2014, p. 13) state that CA uncovers the practices and processes of reasoning which members of a community activate when responding to challenges together.

The lens that CA places on emerging talk, allows an analyst to consider how order and understanding are managed in the moment as the dialogue is being constructed (Stahl, 2013), especially if the analyst is aiming to see how common ground may be being constructed by members' conversation as is the case in the present study. Furthermore, if the analysis can reveal how speakers' contributions connect up to each other and build on prior turns, it may be possible to gain insights into the development of an idea (Shirouzu, 2013). A further consideration in the selection of CA is that the practice of transforming recorded data into detailed transcript form through the application of the Jeffersonian (2004) transcription method typically used in CA, requires repeated engagement with the data. Such focused engagement provides the opportunity for the analyst to familiarise herself with the material at the centre of the study (Koschmann, 2015, p. 562).

Furthermore, the level of detail produced in the Jeffersonian style transcripts meets the aims of the present study. According to Hepburn and Bolden (2007, p. 37), prosodic detail is crucial for understanding how participants negotiate mutual understanding. Howley (2013a, p. 206) also claims that engagement with prosodic aspects such as upward shift, prolonged sounds, timing, silences, pauses, inbreaths, overlapping, and other aspects of intonation, may help the conversation analyst better understand the logistics of learner spoken interaction. A glossary of the symbols used in the transcripts in the present study is shown in chapter 4, Table 4-1.

As for the question of how learning itself may be accounted for in the analysis, Stahl's (2013) criticism of the implementation of before and after type tests as evidence of progress in knowledge construction is influential for the present study. The fact that Cress and Kimmerle (2018, p. 140) concur with Stahl (2013), stating that the use of superficial experimental situations for analysis purposes does not capture the social aspects of peer interaction, provides further support to the decision not to use any kind of knowledge assimilation tests in the present study.

Therefore, the present study will not endeavour to prove that certain knowledge has been assimilated in the course of the task discussion by imposing any form of test for the participants. Instead, the present study adopts Stahl's (2013) suggestion that learner interaction can be analysed through linguistic referents, using recorded evidence of discourse.

Aligning with the dominant theory of the present study, CA views interaction as a process (Azmitia & Montgomery, 1993). It foregrounds sequencing (Sacks et al., 1974, p. 729), which allows the analyst to see how interactants operate on each other's turns and co-construct knowledge (Paulus & Wise, 2019; Damşa, 2014). This takes place not over dyadic adjacent pairs, but over a whole task item, which may comprise of several minutes of talk. In support of Stahl's notion (2006), that reference to prior turns is not limited to immediately adjacent items but rather is a matter of 'logical adjacency', a CA-informed analysis approach such as that seen in studies by Roschelle (1992); Koschmann (2013); or Stahl (2013), embodies a precedented system which can render visible the trajectory of an idea from the moment a speaker vocalises it, through to the end of a discussion.

In order to address the issue of what Heritage and Atkinson (1984, p. 27) refer to as "the problem of Intersubjectivity" (in Koschmann, 2015, p. 560), the analysis for the present study aims to reveal how participants engage with each other's views by looking at how they pick up on each other. If transactivity is encoded in the interaction (Berkowitz & Gibbs, 1983), CA may provide a means of deciphering it (Koschmann, 1999b, p. 105) by revealing how participants relate to one another's points (Jeong et al., 2007). It may also help reveal how speakers pick up on a shared reference from within the knowledge building community (Rosé et al., 2008., p. 258). Whilst upholding the CA premise of using visible data (Stahl, 2006, p. 375), it may be possible to understand how interactants build mutual understanding by focusing on the subsequent turns speakers produce in response to a first pair part (FPP) voiced by another participant in the interaction (Koschmann, 2013, p. 163). CA may therefore allow something to be known about the cognitive openness shown by participants towards points made by others in a given interaction.

A main objective of the present study is to discover how participants pick up on each other's points throughout the whole task item as opposed to only in

immediate initiation and response sequences. Therefore, this study seeks to discover how and where dialogue is being continued rather than how it is completed, as it is through prolongation that opportunity may emerge for the extended work of understanding to occur. Furthermore, because the current study involves groups rather than dyads, I endeavour to take an analysis approach which has the scope to reveal how turns relate to and affect each other, whether these are adjacent or not. As Schegloff (2007, p. 22) states, the use of a model solely based on first pair and second pair parts could impose limitations for data sets of synchronous non-prescriptive talk.

Koschmann's commendation of Sacks et al.'s (1974) "simplest systematics" model (Koschmann, 2013, pp. 151-152) as a way of understanding turn-taking in peer interaction is found to be pertinent to the present study group talk, especially for labelling speakers' turn-taking actions at the *talk-through* stage of the three-part analysis process. *Turn-constructive units* (TCUs) embody the main message in a speaker's utterance. Whilst the TCU could consist of a full grammatical sentence, it could equally encompass a short phrase or single term such as "yeah". In order to determine where one speaker stops and another starts, the term *transition relevance place* (TRP) (Sacks et al., 1974, in Koschmann, 2013, p. 152) is used as a label in the analysis present study to determine whether or how follow-up of idea ensues in the interaction. Brown (2015, p. 404), who uses the alternative term "feedback relevant place" (FRP) as an alternative to TRP, links the notion to CKC, stating that by highlighting instances of participant follow-up on each other's ideas, the analyst can discover implications for the salience of knowledge building elements in the interaction.

This chapter has explored and synthesised key theory around small group learner interaction from the perspective of collective knowledge construction. The purpose of the chapter has been to gain a wide and robust understanding of how transactive interaction may affect collective knowledge construction through a focus on pertinent issues in parallel studies. Through the undertaking of writing this literature review it has become clear that peer-to-peer spoken interaction is unstructured and encompasses multiple intersecting layers. Whilst some of these can be rendered visible through the implementation of a transactivity framework which can be used to find patterns in the recorded and transcribed interaction, other more tacit dimensions of human interaction such as intersubjectivity and

learner agency have been established from precedents found in the literature as underlying factors in peer learner interaction.

Chapter 2 has explained that transactivity is considered as involving three separate dimensions: explicit reasoning, relationality and cognitive openness. The research questions outlined in section 6 of this chapter enable me to consider how and to what extent transactivity is present in the recorded interaction in the present study. That theme will be taken up holistically in chapter 5, as part of the discussion of how transactivity affects CKC.

I have explored the nature and workings of each of the components of transactivity as defined in the present study, and explained how they may facilitate CKC. The indicators of CKC assumed in the present study: change of one's view, challenge of others' view, the emergence of new idea and the development of idea, have also been identified and comprehensively discussed from the perspective of their relation to transactive interaction. Following the explanation of CKC presented in section 3 of the chapter, research question 2 asks how transactivity affects CKC.

Through an engagement with a range of cross-disciplinary studies, I have synthesised some of the main themes of collaborative interaction with emergent issues arising in the learning sciences as identified and illuminated by practitioners in the field. I have reviewed and synthesised studies which propose that particular linguistic aspects may embody a transactive type of speaking and which suggest how this may be linked to CKC. This has led on to the discussion of arguments found in studies within the field of the learning sciences that support the notion that intersubjective aspects of group learning which affect CKC are enhanced through the mechanism of transactivity.

Section 7 of the chapter has focused on the rationale for applying a CA-informed approach to the study of learner spoken interaction by considering perspectives from a range of published studies in the field of the learning sciences.

## **Chapter 3 Methodology**

### **3.1 Introduction**

This chapter builds on chapters 1 and 2 of the present study, by illustrating how the data analysis framework provides a suitable mechanism to probe the research questions as outlined in chapter 2. This chapter also serves to demonstrate the practical aspects of the methodological procedures implemented in the study and explain how decisions have been taken to ensure a robust level of ethical practice at the data collection stage and in the treatment of the data. First this chapter presents an overview of the analysis framework devised to address research questions 1a, 1b, 1c, 1d and 2a. By responding to these questions, the outcomes derived from the data analysis establish the groundwork for the discussion which takes place in chapter 5, of the central issue of the present study, as represented by research question 2b: how transactivity affects collective knowledge construction in small group interaction.

Following an overview of the analysis framework, this chapter offers a systematic account of the procedures implemented in the present study and their implications. The procedures section is divided into five main parts corresponding to i. the selection and implications of the context of the study; ii. the timeline and procedure for data collection; iii. participant recruitment and delegation; iv. the selection and implications of the task materials; v. the methods used in the analysis of the data. The chapter also contains an explanation of the ethical approval process followed in this researcher-practitioner study and the measures implemented to mitigate the impact of potential bias. Finally, there is a section on the perceived limitations of the methodological approach taken in the present study.

### **3.2 How the data analysis framework responds to the research questions**

Following from chapter 2, I see transactivity as involving three separate dimensions: explicit reasoning, relationality and cognitive openness. This is my definition of each of those: explicit reasoning involves making one's rationale visible; relationality involves picking up on other speakers' points; and cognitive

openness involves demonstrating one's acceptance of alternative viewpoints and engaging with them. In order to detect and explore to what extent and how participants in the present study use each of the dimensions of transactivity during a group task, research question 1 is subdivided into three parts (1a, 1b and 1c), with a further question (1d) to explore how the dimensions combine in the interaction.

The data analysis aims to provide answers to research question 1 by identifying instances of the dimensions of transactivity in the dataset of recorded spoken interaction. As is the case in Jeong (2013), both macro and micro linguistic elements are embodied in the present analysis. Micro elements comprise lexicogrammatical and prosodic features based on findings from existing studies in the field, as outlined in Table 2-1. Linguistic features which have not been highlighted as significant in the literature review do not appear in Table 2-1. However, any linguistic features which are found to be effective on the dimensions of transactivity during the execution of the analysis, are highlighted in the talk-through and interpretation sections of the work.

At the macro level, the analysis is concerned with the turn-construction of speakers and aims to find evidence of how the sequencing of turns facilitates transactivity. An integrated approach to the micro and macro levels of spoken discourse is taken in the analysis. As such, micro features are extrapolated and commented on in the talk-through and interpretation sections of the analysis when these are seen to affect the conveyance of explicit reasoning, relationality or cognitive openness within the wider sequencing-based view of the data. A summary of significant linguistic items found in the data is presented in chapter 4.

The data analysis framework devised for the present study also addresses research question 2a, which focuses on indicators of collective knowledge construction (CKC) in the data. Indicators of CKC are identified in relation to the criteria proposed in chapter 2, i.e. change of a speaker's own view, challenge of another's view, the emergence of new idea, and development of idea. Although prolongation of interaction is not assumed as a direct indicator of CKC in the present study, see chapter 2, section 2.1, it is included in the data analysis because it is recognised as a significant factor in the emergence of CKC.

### 3.3 An overview of the data analysis process

As discussed in chapter 2, a conversation analysis (CA) informed approach was taken in the present study. Following the practice of CA my aim was to capture naturally-occurring spoken interaction within a study setting. Although I had established research questions, my objective was to approach the collection and treatment of the dataset in a manner as close to what Sacks (1984, p. 27, in Koschmann, 2013, p. 150) refers to as “unmotivated examination”. As such, the data analysis entailed a three-part process consisting of *marking up*, *talking through* and *interpreting* the data.

#### 3.3.1 The mark-up stage

The three-stage process started with marking up the recorded audio interaction in the format of the Jeffersonian transcription style (Jefferson, 2004), widely used in Conversation Analysis. The act of transforming the recorded data into transcripts following the Jeffersonian method, required repeated engagement with the audio files. This task provided me with the opportunity to familiarise myself with the sounds and patterns of the interaction as I strove to capture and represent prosodic as well as lexico-grammatical detail in written format. Prosody is conveyed in the transcripts through the use and layout of symbols. The symbols express prosodic aspects such as upward shift, prolonged sounds, timing, silences, pauses, inbreaths, overlapping, and other aspects of intonation. A glossary of transcription symbols used in the present analysis is shown in chapter 4, Table 4-1.

##### 3.3.1.1 Columns

As is standard in Jeffersonian transcription style, in the present analysis, the transcripts for each task item are divided into four columns, each of which demonstrates specific information. The text is divided into numbered lines. Line numbers are displayed in the first column. The line numbers are used and shown in parenthesis to refer to turns throughout the subsequent analysis and the proceeding discussion chapter. Information about timing is included in the second column of the transcript, where the starting time of speakers’ contribution is provided in minutes and seconds. This technique allows the duration of each

speaker's turn to be seen easily from an overall view of the transcript. The third column shows an initial letter used to represent the speaker of each turn.

One aspect of group interaction which is particularly relevant to the conveyance of turn-taking is overlapping; where a speaker voices an utterance whilst another speaker is already in flow with their turn. Overlapping may also involve two speakers starting their utterance simultaneously. Following Jefferson (2004), overlap is denoted by square brackets placed in vertical alignment, so that the start of the overlapping turn is lined up below the point in the first speaker's turn with which they coincide. If two participants start speaking simultaneously, the starting time is marked only once in the second column of the transcript.

### 3.3.2 The talk-through stage

The *talk-through* stage of the analysis started with an attempt to gain a holistic view of the data, by reading through the transcript of each task item, whilst listening to the audio recording. Firstly, this step increased my familiarity with the data, and led me to recognise the parts where epistemic topics were discussed. Secondly, it provided the opportunity to perceive each task item as a complete unit, which fostered a deductive understanding of patterns of turn-taking in the talk; who is speaking most, who is picking up on who, and how points are revisited and developed by speakers. When working on the *interpretation* stage I have frequently reverted back to the *talk-through* stage to gain a fuller view of the context of a section of interaction.

At the *talk-through* stage of the analysis, decisions had to be taken about what to include to best reflect the purpose and genre of this study. This implied only working with talk which discussed epistemic issues as opposed to social or functional content, such as when speakers use instructional discourse such as 'the second one...' to manage group interaction. Following precedents set by other researchers in the field, non-reasoning statements (Howley et al., 2013b), such as social or "off-tangent" (Sionti et al., 2012) utterances which are not directly related to the task itself are not subject to analysis in the present study. At the *talk-through* stage, linguistic features- both those listed in Table 2-1, and emergent ones- are highlighted and examined as potential indicators of CKC. The *mark-up* and *talk-through* stages prepare for the third *interpretation* stage.

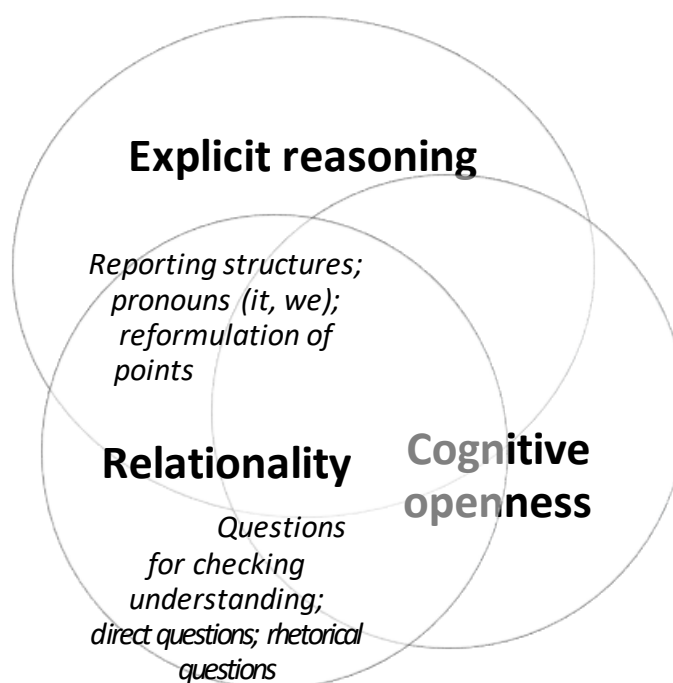
Linguistic features identified in Table 2-1 as being drivers of each dimension of transactivity, are highlighted in the *talk-through* section of the analysis. As well as facilitating the recognition of those precedented transactive linguistic features discovered from engagement with work in the field (see chapter 2), the inductive approach of this research design is devised to incorporate the scope for other lexico-grammatical and prosodic items to emerge through the examination of the transcripts at the *talk-through* stage.

### 3.3.3 The interpretation stage

The *interpretation* stage follows the structure set out by the research questions. It is sub-divided into two sections; the first of which aims to identify and explore the dimensions of transactivity in the data in response to research questions 1a, 1b, 1c, and 1d. The second section of the *interpretation* stage responds to research question 2a, by summarising indicators of CKC such as change of a speaker's own view. In cases where no evidence is detected of transactivity or CKC, this is noted in the data analysis, and discussed in chapter 5.

Part 1 of the *interpretation* stage addresses research questions 1a, 1b and 1c by focusing on the way that transactivity may be functioning in the interaction by extrapolating examples of each of the three dimensions identified in the study: explicit reasoning, relationality and cognitive openness. It is at the first stage of the *interpretation* section of the data analysis that I identify how the three dimensions of transactivity are activated through the talk. I do this by listing instances one by one under the abbreviated terms EXP (Explicit Reasoning); REL (Relationality); and OP (Cognitive Openness), and highlighting in the commentary the use of any of the structures listed in Table 2-1, as well as of any other linguistic features which emerge in the data set as being significant to transactivity.

Research question 1d is addressed in part 1 of the *interpretation* section by a paragraph which summarises how the three dimensions interplay in the interaction. In relation to this, Waring's (2002, p. 475) notion of "double duties" of linguistic features is useful in the present analysis. For example, reporting structures may signal relationality by linking a speaker's turn to the utterance of another speaker in the group, whilst rendering reasoning more explicit by citing a shared reference.



**Figure 3-1 Linguistic features which straddle the dimensions of transactivity**

The *interpretation* section lays the groundwork for the response to research question 2b, which takes the form of a holistic discussion in chapter 5, about how the three dimensions of transactivity are effective as individual and combined operators on CKC. Whilst as discussed in chapter 2, the embedded nature of transactivity in spoken interaction requires an approach which aims to detect relationality between speakers by examining sequencing of speakers' turns, lexico-grammatical and prosodic features are also considered to hold significance for the illumination of transactivity, see Table 2-1. Accordingly, the textual commentary throughout the interpretation section of the analysis recognises specific linguistic features where these are considered to have an effect on transactivity.

### **3.3.3.1 The identification of the four indicators of collective knowledge construction in the *interpretation* section part 2**

Part 2 of the *interpretation* stage of the data analysis responds to research question 2a, by focusing on the established indicators of CKC as represented in a

table (see Table 3-1 below). The word “yes” in the table indicates that indicators of change of a speaker’s view, challenge posed to a speaker from another, prolongation of interaction, the emergence of new idea, and follow-up of idea have been found in the Item. If indicators of new idea and follow-up of idea are recurrent throughout a task item, the number of occurrences is stated.

**Table 3-1 Summary table of indicators of Collective Knowledge Construction**

Item - Change, challenge, prolongation, emergence of new idea, follow-up of idea	
Change of a speaker’s own view	
Challenge of another speaker’s view	
Prolongation of interaction	
Emergence of new idea	
Follow-up of idea	

In response to research question 2a and in preparation for the response to research question 2b, there is also a written assessment of each of the indicators. Prolongation of the interaction is also taken into account in the analysis as a potentially indicative factor in the analysis of CKC. However, prolongation is not categorised as a direct indicator of CKC in the present study, as discussed in chapter 2. Therefore, prolongation is treated as an underlying factor but not a causal one of CKC in the present study.

Change of a speaker’s own view is catalogued in the analysis through explicit declarations that a speaker has changed their opinion as well as through more implicit indications of a shift in views or appropriation of others’ points over the course of a task item. Challenge of another speaker’s view is accounted for by the voicing of dissent through the use of lexico-grammatical features, as well as by intonation. Prolongation is commented on by assessing to what extent speakers continue the interaction. Often there is overlap between prolongation and other indicators such as follow-up. New ideas are designated as such if they embody any nuanced angle or difference from what the collective already have established as common ground. For example, if speakers merely repeat the task statement in their turn, this is not considered new idea, if they paraphrase the task statement in a way that invokes nuance or alternative angle to a premise, then it is classed as new idea. Follow-up of idea is recognised in the analysis if a turn embodies

expansion of a notion due to the addition of information or nuance of the original point.

In relation to Research Question 2a, and the indicators of CKC in each item, a summary table (see chapter 4, Table 4-24) provides a quick view of the prolongation of each Item, instances of change of a speaker's own view, challenge of another speaker's view, the emergence of new idea, and follow-up of idea.

### 3.4 The procedures adopted in the present study

#### 3.4.1 Timeline for data collection

**Table 3-2 Timeline for data collection**

STAGE 1 (June 2021)	STAGE 2 (July 2021)	STAGE 3 (August - October 2021)
Pre-collection phase- i. securing ethics approval ii. Informing potential participants (plain language statement document) iii. Issuing and collecting consent forms	Collection phase: iv. Recording data v. Storage of data	Post-collection phase vi. Treatment and preparation of data

#### 3.4.2 The context: subject field and format of interaction

The educational context selected for the present study was an English for Academic Purposes (EAP) pre-sessional programme taking place at a university in Scotland in June and July 2021. The EAP course was deemed a suitable context for the present study due to the small class groups, which would allow for a controlled breakdown of participants, as well as the maturity of the students. Like many other EAP pre-sessional courses, this university programme had the objective of increasing international students' level of English whilst readying them for academic tasks typical of university study. Students had an average level of 6 - 6.5 on the International English Language Testing System (IELTS).

Although the annual programme had previously been delivered in face-to-face formats, from May 2020 online delivery was adopted due to the Covid pandemic and this continued for the 2021 programme, where recordings were made of spoken interaction among students in two small groups for the purposes of the present study. The online meeting platform Zoom was the interface used at the University to deliver the EAP pre-sessional programme. Students attended lessons from their respective locations and although students would usually have their cameras switched on so that they were visible to each other on the screen during lessons, only audio recordings were used in the present study due to the focus on spoken interaction.

The online meeting platform technology included the facility to divide students into separate breakout rooms, where they could work on tasks without the presence of the tutor, which was a facility routinely used in lessons on the programme. Tutors had the option of placing students in the rooms by name or allowing a random selection to take place. On the day of the data collection the random sorting of students was selected.

### **3.4.3 Participant recruitment in a researcher-practitioner study**

During the months leading up to the pre-sessional EAP programme, there was considerable unpredictability around the format of delivery since even the course providers did not have definitive forecasts of how long the pandemic would last or consequently of how long the online format would prevail. It was under these circumstances that I took the decision to adopt a researcher-practitioner approach to the study (Hanks, 2019, p. 143), which I could do through my role as tutor of two groups of students on a pre-sessional EAP course. I believed that having access to a level of direct and regular contact with participants would be advantageous in uncertain circumstances. For example, if technical problems were to interrupt the online recordings, I would be able to re-schedule the data collection task by arranging this directly with participants.

In order to adhere to the practice upheld in Conversation Analysis of “unmotivated looking” Sacks (1984), my objective was to avoid any deliberate process of selection of participants whose interaction would be recorded for the purpose of the study. With this motive, I invited all of the students from two class groups in

the EAP programme on which I was teaching in June 2021 to take part in the study. These students are all second language learners of English who have already achieved an intermediate level of English, corresponding to IELTS level 6 as a minimum entry level on the programme. It is assumed that the students will be taught through the medium of English and that they will be able to perform to a reasonable level in tasks and assignments across the four skills of reading, listening, speaking and writing on the programme. Students are not being taught English as a foreign language, but rather how to work in an academic setting where the language of instruction is English. It is recognised that while this situation has implications for the level of grammatical accuracy or lexical range produced by speakers in the present study, speakers have a high enough level of communicative competence to make their meaning clear, as is evidenced in the transcripts.

Although in my class groups it happened that all participants were of Chinese nationality and were taking the course remotely from their base in China, this was not a deliberate factor in the present study. I was interested in obtaining data of group interaction in a task-based learning setting. Correspondingly, I did not aim to attain idiosyncratic profiling information from participants. Following the parameters established in CA, where all claims must be grounded in the recorded data (Koschmann, 2013, p. 151) the primary focus of the research framework designed for the present study is the spoken interaction produced by the participants.

#### **3.4.4 The random selection of participants**

By avoiding individual information, I was able to focus on the spoken output itself and avoid any potential bias which may be caused by profiling. All participants were aiming to secure places on diverse master's programmes at the University, having been offered conditional places contingent on increasing their level of English by the end of the pre-sessional programme. Each class group comprised ten students. All of the students consented to take part in the study following the ethical procedures (see Appendix 1), which created a pool of twenty participants who could potentially take part in the study whether in the morning or afternoon lesson. A wider pool of participants allowed scope in case of any participant absence and facilitated the system of random selection of participants as described below. In each class two groups of five did the task, working

simultaneously in two different breakout rooms. As meeting facilitator, I had the facility to record the interaction taking place in only one of the rooms. It was important that I had control over the recording of the interaction taking place rather than leave this in the hands of the participants. It had implications for the storage and security of the data, because the recording was linked to my teacher account and sent to me as a secure file after the recording was complete.

On the day of the data collection, I avoided deliberate selection of participants by using the functional tools available on Zoom to distribute the 10 students in each lesson randomly into two groups of 5 participants. I then used the Zoom recording function to record the interaction taking place in one 'Zoom breakout room' thus capturing the interaction taking place among the five participants who had been randomly placed in that room. The final data set therefore comprised of recorded interaction which took place between two groups of five members. I have used the label "Group a" to identify the group comprising students from the morning class, whilst "Group b" denotes the group made up of students from the afternoon class. Since each group consisted of five participants, the total number of participants in the present study was ten. Due to the length of the task, and the level of detail depicted in the transcripts, the number of ten participants was considered to be appropriate for the logistical scope of the present study as well as enough to provide a feasible dataset to work with in the analysis for the present study.

### **3.4.5 The selection and implications of the task materials**

An important consideration in this study was to carry out data collection in a way which did not upset the ordinary procedures and content delivery of the course so as not to have any negative repercussions on the schedule of course work or on the students' learning experience. This factor is recognised in the ethics approval document (see Appendix 1).

As well as the ethical reason of upholding students' learning experience, it was an important aspect of CA to maintain as natural a context as possible for data collection. This implied collecting data consisting of spoken interaction which occurred during a task that participants would have completed as an integral part of the course, irrespective of my research. This strategy meets Sacks' (1992)

criteria about collecting data from places where it ordinarily occurs in order to understand and analyse participants' interaction (Uttamchandani & Lester, 2021, p. 27).

By selecting a task which was programmed in the syllabus and which was published in the students' digital coursebook, the course content schedule was not affected. Not only did this simplify logistics, as participants already had a copy of the material, but it may have ensured higher levels of motivation since students usually aimed to complete the curriculum tasks to a high standard within their overall aim of gaining a positive report at the end of the course.

**Table 3-3 The Task for group discussion**

	<i>Discuss the statements below and decide if they are true or false</i>
1	You can write a summary without fully understanding the original text as long as you include enough key words from the text.
2	A summary should be no more than 25% of the length of the original text.
3	It is possible to summarise a research paper or article in a single sentence.
4	A summary cannot contain any direct quotations.
5	A summary should contain all the information in the original text.
6	The information and ideas in the original should be given in the same order.
7	You should never comment on the original text.
8	When writing a summary it is better to use notes you have made from the original text rather than to write while looking at the text.
9	You don't need to give the source of the information if you agree with the opinions expressed.

The nine statements in the task displayed above relate to academic writing, which the students have been studying on the course. Groups were asked to discuss whether each statement is true or false. Although an overall timescale of 20 minutes for task completion was proposed by the tutor at the outset of the task, groups controlled how long to spend on the discussion of each statement.

### 3.4.5.1 Task suitability

For the purposes of the investigation of transactive spoken interaction it was important to select a task which would allow the opportunity for open discussion whereby participants have the scope to engage with each other and contribute and develop ideas, thereby invoking synchronous group work (Sawyer & Berson, 2004). The task instruction states that participants should discuss and decide whether statements are true or false. Before the participants embarked on the task this instruction was reiterated verbally by the tutor, with the caveat that the objective of the task was to discuss the statements fully, even if a consensus was not always reached. The clear parameters implied in the task instruction, i.e. to aim to decide if each statement was true or false, embodied a tangible and straightforward framework which all participants seemed to grasp and respond to. Even if the meaning of the statements was not always clear to participants, the simple format of the task was advantageous given the circumstances of the learning context; with L2 participants distributed geographically during a global pandemic.

Conversely, in several items the puzzle which emerged over the meaning of the statement (as opposed to whether it was true or false) seemed to provoke and intensify group discussion. Far from being a problematic factor, a task comprising nebulous statements may foster group interaction by posing a conceptual challenge which groups in higher education settings may find motivating. In chapter 5 the impact of the effect of the semantics of each task statement on the group discussion will be addressed further.

### 3.4.6 The analysis of the data

#### 3.4.6.1 The procedures of the analysis in chronological steps

This section outlines the procedures followed in order to execute the data analysis for the present study.

**Table 3-4 The steps of the data analysis in chronological order**

<p><b>Step i.</b> Preparation- listen to each recording several times to familiarise with sounds, speakers voices, distinguish the task items.</p>
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**Step ii.** Preparation for transcribing of audio data: anonymise speakers through the use of pseudonyms.

**Step iii.** Following models of Jeffersonian transcripts, layout tables with corresponding labels, measure the timing of turns.

**Step iv.** Produce detailed transcriptions, item by item (18 items in total).

**Step v.** Read the transcripts and write commentary (*talk through*) sections.

**Step vi.** *Interpretation*: revisit each item one by one highlighting in the transcripts instances of transactivity in relation to research questions 1a, 1b, 1c- use the abbreviations: EXP, REL, OP, to label instances and write separate commentary for each one.

**Step vii.** *Interpretation* continued: revisit each item reading the whole transcript to gain a deductive view of how the three dimensions of transactivity interplay with one another in relation to research question 1d.

**Step viii.** *Interpretation* continued: revisit the transcripts for each item and extrapolate instances of each indicator of collective knowledge construction (CKC) in each one. Take a count of how many instances there are of each indicator. Assess whether there is prolongation. Input the information into summary table for each item (as per Table 3-1).

**Step ix.** Write a summary commentary about each indicator of CKC found in each item based on the completed version of Table 3-1.

### 3.4.6.2 Terminology used in the analysis

As explained in chapter 2, the CA terminology of first pair part (FPP) and second pair part (SPP) is useful for labelling participants' turns in the analysis in the present study. However, as explored in chapter 2, these terms are used along with others which are helpful to denote talking turns and key moments in the interaction in groups of around five participants. The notions of turn-construction unit (TCU) to indicate speakers' utterances, and transition relevance place (TRP) to indicate natural moments of opportunity for change of speaker such as a pause, are implemented in the data analysis process at the *talk-through stage*.

### 3.4.6.3 Group dialogue as the unit of analysis

The present study follows the precedent set by scholars who have used the group as the unit of analysis (UOA) in studies of CKC. Roschelle (1992, p. 272) claims that the selection of group dialogue as the UOA may reveal how the difference in

ideas manifested in the dialogue promotes constructive interaction, whereby participants produce persuasive explanations of their views. Stahl (2013, p. 513), proposes the group as the UOA when one is interested in interactions among group members, rather than the status of individual participant. Shirouzu (2013) also stresses that collective action is more than an aggregate of separate individual acts, and claims that using group dialogue as the UOA may reveal how collaborative conceptual change emerges as interactants try to reach a consensus in their conclusions.

#### **3.4.6.4 Division of the dataset into Items by Task Statement**

Audio recordings were made of two separate and unrelated groups of students performing the task which comprised 9 items. As groups talk through each statement, it emerged that the discussion of each task statement has a starting point, a development phase and some indication of closure. Boundaries were marked in the recorded interaction by instructional phrases voiced by group members, such as “The first one” or “The next one”. Each of the two groups discusses nine statements, resulting in eighteen items in total. Each statement discussion is referred to as one data item. I refer to the Items in this study as 1a and 1b, 2a and 2b, etc. For example, Statement 3, that *it is possible to summarise a research paper or article in a single sentence* is discussed by Group a, and later by Group b, producing 2 data items corresponding to the discussion of that task statement.

### **3.5 Ethical issues and the avoidance of bias**

Ethics Approval was granted for this project, under the reference number 100200117 (see Appendix 1) for the collection of data to go ahead during the pre-sessional EAP course. Samples of the participant information sheet and the participant consent form are also included in Appendix 1.

#### **3.5.1 Ethical Considerations of role of researcher-practitioner**

My joint role in the present study posed significant implications due to the integration of the research design with the learning environment of the participants. The participation of my own students may have given me more

control over the procedures incorporated into the research design, however the use of student participant raises ethical concerns due to the fiduciary relationship, as well as ones to do with criticality and the avoidance of bias (Ferguson et al., 2004). A fiduciary relationship is defined by Ferguson et al. (2004, p. 56) as one in which two parties are unequal, and the more powerful party is entrusted to protect the best interests of the dependent party. The nature of the data collection in this project, especially since it encompasses recordings of live unscripted peer interaction, could be potentially challenging for the students. If trust is broken, there may be a detrimental effect on the learning situation as well as on the research relationship (Ferguson et al., 2004, p. 56). In order to establish trust and reduce the potential of anxiety for students, care was taken to ensure transparency when presenting the project to the participants.

My aim was for students to understand the motives for the project, as well as what it would entail for them in terms of responsibility, for example in completing the participant consent form or in being recorded when completing the task. Above all, it was imperative that students should not feel any pressure to participate in the data collection, and I wished to emphasise this when presenting the activity to the student. To increase comprehension of the project for participants, I prepared and shared a short script with them. Another important factor was that the administrative tasks of reading, signing and returning consent forms, would not detract from students' learning time on the course. Having the written script also allowed me to share the key points with the students on the screen, which I believed would help eliminate any confusion, especially as some students seemed to be struggling somewhat with listening comprehension. In order to increase comprehension, I read the script aloud and emphasised the opportunity to ask questions now or after reflecting on the information. I stressed that this event was in no way related to course results, but that participants would be contributing to a research project designed to learn more about group communication in EAP.

### **3.5.2 Anonymity of participants**

Maintaining anonymity of participants was of equal importance for the tenet of CA about the natural treatment of data and the ensuring of objectivity and the avoidance of observer bias, as it was for the ethical issue of the protection of the

student participants. For this reason, I did not enter the breakout room where the students were having their discussion.

In order to ensure anonymity of participants (Roschelle, 1992), I assigned a pseudonym for each speaker which was used throughout the data analysis and in the subsequent stages of the study. I used the pseudonym in the transcripts to substitute real proper names which speakers occasionally used when referring to other participants by their first names during the discussion. Throughout the study, the initials taken from the pseudonyms are used to represent each speaker in the third column of the transcripts and thereafter in the thesis. I believe that both the adoption of pseudonyms and the use of initials to represent speakers were beneficial in achieving a sense of distancing from the participants when I was analysing their talk and that this may have helped to reduce the risk of practitioner bias. Whilst it would be impossible to achieve total anonymity when working from recordings of my own students' talk, the avoidance of participants' authentic names allowed me to focus more intently on the language produced, as opposed to characteristics of individual speakers.

### **3.6 Limitations and considerations**

The fact that the speakers use English as a second language (L2), may have the potential to affect both turn-taking and length and timing of students' spoken output. Although the students have to have passed an IELTS test at minimum level '6' to enrol on the course, there is some degree of mixed ability across the skills areas, with students showing stronger or weaker ability in different aspects of speaking as well as with the other skills (reading, writing and listening).

The present study would have been conducted in a different way had it not been for the enduring world pandemic. The event of the pandemic in early 2020 resulted in an abrupt shift from face-to-face to online EAP delivery at universities across the world. In summer 2021, the fact that pre-sessional EAP courses at UK universities were still being delivered in an online format meant that the data collection was conducted in a virtual classroom setting instead of a face-to-face one.

The participants in this study share a common first language (Mandarin). Despite this, during lessons the classroom language is English and only on rare occasions did students use Mandarin. For motives of ethical issues and research integrity, I obtained a translation of any instances of the use of students' first language and this is shown in the transcripts in chapter 4. Ultimately, the use of Mandarin was not considered to be a significant aspect to the addressing of the central questions in the present study, however, the implications of any code-switching produced in the interaction are discussed in chapter 5.

### **3.7 Summary of the Methodology Chapter**

This chapter has explained the order and content of procedures that were adopted in order to provide a framework which could facilitate a rigorous probe into the questions at the centre of the present study. I have illuminated how the framework ensures both ethical compliance and the avoidance of bias when planning, conducting and analysing this classroom-based study.

## Chapter 4 The Data Analysis

The organisation of this chapter corresponds to the structure of the task that was completed by the two participant groups for the facilitation of data collection. The task comprises 9 statements to be discussed by participants with the instruction that they should aim to reach a group consensus about whether each statement is true or false. The statements all refer to methods of writing summary paragraphs of academic articles; for example, “a summary should not include any direct quotations” or “you can write summary without understanding as long as you use enough key words”.

The outline for each Item consists of i. a transcript of the discussion for the task statement, ii. a *talk-though* section of the transcript which aims to illuminate moves and underlying actions between speakers, and iii. an *interpretation* section which is divided into two parts and structured in response to the research questions for the present study.

The transcripts follow the Jefferson referencing style of conventions as is represented in Table 4-1 below. See chapter 3, section 3.3.1.1 for further explanation of the layout of the transcripts.

**Table 4-1 Glossary of transcription symbols**

<b>Symbol</b>	<b>Meaning</b>
[	denotes the point where overlap begins for each speaker when 2 speakers overlap
[	
( )	inability to identify a speaker in the speaker-designation column
(( ))	transcriber's notes
.hhh	breathes in
hhh	breathes out
(.)	pause of 0.1 of second or less
(1.2)	pause to the tenth of second

ː, ːː, ːːː	prolonged sound by extent of prolongation
ABC	voiced loudly
=	stressed phoneme/word
↑	upward shift
↓	downward shift
becau-	word cuts off abruptly
=	when an utterance immediately follows the previous speaker's
> <	speeded up talk
< >	slowed down talk

## 4.1 Task Items

Item 1a.1 Transcript of interaction produced by Group a in response to Statement 1 - *you can write a summary without fully understanding as long as you use enough key words*

01	1:01	Y:	Ok, (4.0) yeah so the first one...
02	1:09		(7.0)
03	1:16	J:	.hhh eh, so I don't I don't really think we can eh write
04			write just key words without fully understanding the
05			original text if we want to summarising any articles .hhh
06			cause ehm just key words may eh cause some misleading
07			of the meaning of this article and eh ehm (1.0) maybe,
08			maybe this article don't want to talk about eh the situation
09			we want to eh we want to mention but eh the it it has the
10			same [key words so we need to pay attention to pay more
11			attention to the eh the real eh- real meaning of the
12			original text. Eh, it's my opinion.
13		Y:	[Yes.
14	2:02	Y:	=Yes. Yes, I agree with you.
15	2:06	X:	Eh, yes, if we just knew the key words .hhh eh we can't
16			know the eh understanding of the (.) original text, so we
17			cannot write ↓a summary
18	2:19	Y:	Yes
19	2:21	Y:	And the second one, eh? sorry
20	2:26		(5.0)
21	2:31	Y:	Yeah. (4.0) Ok, the second, the second one.

### 1a.2 Talk-through

The Item is dominated by J's long turn (3-12). After a silence of 7 seconds (2), J takes up the turn construction unit (TCU) (3) and immediately establishes the JPS by making a declaration (3-5) with an externalisation of their view. Then J transforms their externalisation in two stages: first they state the main reason for their view (6-7), employing the causal phrase: "cause" (6) to rationalise their idea that dependency on key words may lead to misunderstanding of the meaning of an academic article, before offering a further reason as to why confusion could occur (8-10). They use the modal verb of possibility (6) and the hedging adverbial (maybe) (7, 8). The final stage of J's turn (10-12) consists of an assertion of the action that the collective should take, framed by the resultative linking adjunct "so" (10), which is juxtaposed with the subject pronoun "we" (10), invoking the use of a presupposition with the comparative "more" (10), the implication being that not enough attention is currently being afforded by the group to the real meaning in a given academic article, and the use of the deontic modal, 'need', asserts the adoption of change in the group's course of action.

Y's turn (13-14) constitutes a SPP which responds directly to J's turn (3-12).

X (15-17) summarises J's point about the possible loss of understanding of the original text if only key words are used. X paraphrases J's use of the word 'meaning' with 'understanding' (16). The resultative linking adjunct "so" (16), parallels J's use of the same linguistic feature (10) and leads smoothly into the logical conclusion that they would be unable to write a summary without understanding the original text. X (15) relates to J by picking up on the phrase "just key words" used twice by J (4, 6). They employ the collective pronoun "we" three times (15, 16) which consolidates the team nature of the task, just as J has done previously (9). J's repeated use of "we" (3,5,9, 10), robustly establishes that the decision to be made about how to summarise articles, is a collective endeavour for the whole group.

The downward shift at the end of X's turn (17) solidifies the collective decision that Statement 1 is false. No other group members contribute to this task item. The discussion of Statement 1 is concluded by Y's move to the following task statement ('the second one') (19, 21).

### 1a.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a

#### 1a.3.1 Explicit reasoning, relationality, and cognitive openness

*Research question 1a: To what degree and how do interactants convey explicit reasoning?*

**EXP** - J (3-12) offers an explicit rationale as to why the students should not only rely on key words.

**EXP** - X (15-17) produces explicit reasoning, using the resultative “so” and extended explanation, as to why they agree with J.

*Research question 1b: To what degree and how do interactants relate to points made by other speakers?*

**REL** - X (15) picks up on J’s turn (4, 6) (3, 5, 9, 10). X relates to J’s turn, both in the language they use which reiterates from J (“key words”, “if we just knew”), and in the view expressed.

*Research question 1c: To what degree and how do interactants manifest cognitive openness in their talk?*

**OP** - J’s turn includes numerous hedging features (3, 6, 7, 8) which convey possibility.

**OP** - X (15) uses the conditional “if we just knew the key words” which presupposes that there is another option which consists of something different to the reliance on key words.

*Research question 1d: How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

The three dimensions of transactivity combine in Item 1a. J’s turn shows both *explicit rationale* and *cognitive openness*. X’s turn shows *relationality* as she picks

up on J but also conveys *cognitive openness* by the use of the conditional tense (“if...”), and embodies *explicit reasoning* as she justifies her view with extended explanation.

### 1a.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-2 Evidence of CKC and prolongation item 1a**

Item 1a. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker’s own view	no
Challenge of another speaker’s view	no
Prolongation of interaction	yes
Emergence of new idea	yes (2 instances)
Follow-up of idea	yes (1 instance)

#### **Change of a speaker’s own view**

There is no evidence of change of a speaker’s own view.

#### **Challenge of another speaker’s view**

There is no evidence of challenge of another speaker’s view.

#### **Prolongation of interaction**

J’s discussion of the premise of ‘key words’, is prolonged by X when they pick the point up at the TRP and paraphrase it.

#### **Emergence of new idea**

In (5-6), J posits that if a summary only understands the key words of an original article, that this is not enough to write a summary.

In (10-11), J contributes a second new idea, when they stress the need to pay attention to the real meaning of the original text.

### Follow-up of idea

X (15-17) reinforces J's idea by repeating the softener "just" (Carter & McCarthy, 2006, p. 99). By collocating just with the verb "knew" in a second conditional clause, and relating this to the notion of not being able to understand the text, X adds nuance to J's idea.

### Item 1b.1 Transcript of interaction produced by Group b in response to Statement 1 - *you can write a summary without fully understanding as long as you use enough key words*

01	1:22	L:	Who will share the screen?
02	1:27		(1.0)
03	1:28	D:	Ok
04	1:30	Z:	Eh, I can share the screen (0.5) because I'm, [I'm not sure my
05			answer. (0.5) Can you see it?
06	1:38	L:	Yes=
07	1:40	P:	=Eh, yes.
08	1:43	Z:	[Eh..
09	1:43	D:	[(speaks Chinese))
10	1:47	()	=(quiet laughing)
11	1:51	Z:	=Hmm, the the first one I'm not sure it's false or true but eh I
12			I think in my opinion (.) I think it's false, (1.5) ↓Hmm.
13	2:06		(5.0)
14	2:11	Z:	((speaks Chinese))
15	2:20	D:	You can [write a summary
16		X:	[fully understand it
17	2:29		(4.0)
18	2:33	D:	As a comment is it eh true or false? ((laughs)) ((speaks
19			Chinese)) (we have to give a unified answer)
20	2:40	L:	=(speaks Chinese))
21	2:47	Z:	Oh ((unintelligible))=
22	2:49	P:	=Yes, we're recording it
23	2:53		(2.0)
24	2:55	X:	Tchoo (tutting sound) (sighs audibly deeply) hmm. (1.0)
25			.hhh I think it's true cause eh, ah- it said the full without fully
26			understanding fully understanding maybe where the (-) article
27			(.) hhh the details about the details but when lookout only
28			lookout the article erm, to understand ↑the meaning (1.5) .hhh
.	.	.	.

29			Forget it (tuts), Let me take a study [(laughs)) understand the
30			meaning
31	3:19	Z:	[ ((laughs)) Hmm, Ok. ((laughs))
32	3:23	L:	Main idea
33	3:25		(2.0)
34	3:27	Z:	Hmm, Yes, so...
35	3:29	L:	Eh, but but but I think if you want to write a summary you
36			need to (.) eh: you need to maybe:: eh:: make a:: visualiser,
37			like a visualiser, you know, eh, [each paragraph, eh what what
38			if what extent of each paragraph (.) then in summary you need
39			to write eh how how the author gives the conclusion and eh
40			how is maybe the research (.) research eh result in (.) what
41			kind of result. [Yes? I I think it's ↓necessary, in my opinion
42	4:07	Z:	[Hmm
43	4:14	Z:	Oh, (1.0) hmm. So you think the first one is eh false or true?
44	4:21		(2.0)
45	4:23	L:	What about others?
46	4:27		(4.0)
47	4:31	Z:	↓Hmm
48	4:33		(5.0)
49	4:38	Z:	((laughs))
50	4:41	P:	.hhh Eh... I don't understand the words it means "fully
51			understanding" hhh, eh if I just understand some main eh
52			argument that means the fully understanding? or maybe I need
53			to read eh all the details. Read the whole article and
54			understand all the details (.) I think, hhh
55	4:55	Z:	I think it's fully understanding
56	4:59		(1.0)
57	5:00	P:	[Eh...I think
58	5:05	Z:	[I think so ((coughs))
59	5:08	P:	I think eh maybe we just eh need to understand the (1.0) eh..
60			main argument, ehm I'm not sure ((laughs))
61	5:18		(9.0)
62	5:27	L:	What about you Ziri, what do you think?
63	5:32	Z:	Hmm. I think (1.0) hmm I agree with Xing (1.0) I think it's true
64			we we should not to understand the whole article and all the
65			details (5.0) so I think first one is true.
66	5:46		(5.0)
67	5:51	P:	((speaking under their breath))
68	5:58	D:	[Write summary down...
69		L:	[Ziri why do you think it's true?
70	6:06	Z:	Hmm, eh.. I think we shouldn't to read the whole article in eh
71			because we just eh have to write a summary read the whole
72			article and (.) it's too difficult and we don't need to do it, we
73			just eh need to know enough key words or enough key
74			sentence (.), it help us to understand the main ideas of the
75			article.
76	6:26	D:	So it's (.) it should be true, it says without fully understanding
77			[eh ((referring to shared worksheet)) and then as long as you
78			(.) include enough key words.. yeah. The first answer will ↓be
79			true, yeah.
80	6:46	P:	[Yeah...yes
.			

81	6:49	Z:	[No, yeah I think it's true
82	6:54	Z:	Ok, hmm. The ↓second one.

### Glossary of Chinese speech used in transcript

(10) - 就这样 · 就这个吧 · 挺好的 = Let's go with it, it's fine

(15, 18-19) - 精简的 = According to the worksheet...we have to give a unified answer

(20) - 咱们不该说中文 · 这个(在)录音呢 = we're not supposed to speak Chinese, this is being recorded

### 1b.2 Talk-through

Z states their opinion (11-12) that the statement is false, but adds nothing to expand or justify this view. Several pause fillers add hesitancy to their turn (11-12).

Due to several turns where the logistics of the situation, rather than possible answers to the task, are described, the next turn which takes up the task statement (in response to Z) is line 24, where X offers their view of the answer. First they declare that the statement is true (25), and then making reference to its content (26) they use the third person pronoun "it said...", to make a distancing move to which they segues with the subordinate clause headed by the causal conjunction "cause", to frame an explanation of their view.

L self-selects at the Transition Relevance Place (TRP) (32) after Z's turn. L reiterates 2 words from the task statement, "main idea". L (35-41) goes on to suggest a system for summarising paragraphs.

It is not clear if Z's (43) question is directed at L or at the whole group, but there is a notable lack of response, emphasised by a pause of 2 seconds, and rather than

answer Z's request, L chooses to ask the rest of the group an open question: "what about others?" (45), which seems to indicate the pursuit of wider participation.

P's contribution (50-54) constitutes an overt declaration that they are puzzling over the meaning of the statement itself. They postulate two or three ways to understand the phrase, "fully understanding". P's (50) turn consists of 3 TCUs - i. "I don't understand..."; ii. "if I just understand some main argument..."; iii. "or maybe I need to read eh all the details..." Z (55) offers a response to P's confusion, and extends the discussion of the meaning of the statement. Z's use of "it" is a deictic tying structure, which links the discourse back to P's query.

By coming back in after Z's turn, P (59) indicates that they are not convinced by Z's point, in fact, they present a challenge to Z; P thinks it is a matter of understanding all the details, whereas Z thinks it is about understanding the main point.

L (62) positions Z to speak by using Z's first name. Z (63-65) complies with L's request. Z refers to the earlier contribution by X by name, as they move on from their initial simple consensual agreement ("I agree with Xing") to justify this view, paraphrasing X's previous points, about there not being a need to understand the whole article. Z (63) states that they now believe the statement to be true, effectively declaring a change of opinion from the early part of the Item, where they said they thought it was false.

L (69) again poses a direct question to Z, which leads to Z's (70-75) explicit reasoning of their view. In this response, Z synthesises ideas and returns to the the concept of "understand the main ideas of the article" previously debated by P.

D's use of "so" (76) in the first position of their turn, allows their statement to operate on the preceding interaction in this Item, as they stress the notion of the main idea. The first use of "it" (76) has the deictic function of tying in to the whole discussion of the question which has occurred up until this point. The double use of the expression "yeah" (78, 79) seems to add support to the point they are relaying. However, D hedges the collective summary by employing the modal "should" which allows a degree of flexibility. Both the use of a downward shift

(79), and the separation of the collective view (that it is true) into a new TCU, where D dispenses with the pronoun (“it”) to use the full nominative: “the first answer”, infer that the group consensus is that the answer is true, even if some members have not really expressed this idea. D is supported by P (80) and Z (81), which adds strength to the collective status of the decision uttered by D.

### **1b.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a**

#### **1b.3.1 Explicit reasoning, relationality, and cognitive openness**

*Research question 1a: To what degree and how do interactants convey explicit reasoning?*

**EXP - X (24-28)**, develops an explanation of view with several sub clauses, resultatives and reference to the shared resource which is the task statement (“it said”).

**EXP - L (35-41)**, explains how to go about writing a summary, using cohesive devices to explain a comprehensive process with several steps, and including tangible examples of components to include.

**EXP - Z (70-75)**, provides a comprehensive justification in support of their deontic claim (“we shouldn’t”) that they should not read the whole article, making use of the causal conjunction “because” to frame their reasoning that it is too difficult to read everything.

*Research question 1b: To what degree and how do interactants relate to points made by other speakers?*

**REL - P (52-54)** the use of the direct question (52) relates to the other group members, by tacitly inviting them to engage with the issue. By adopting the pronoun “we” (59), P infers that the whole group is included in the action.

REL - Z (55) picks up on P as an adjacency pair or SPP to their FPP, then, after other speakers' turns, P (59-60) refers to the issue again, stating their view, which has now become more consolidated in the course of the interaction.

REL - L (69) elicits a contribution from Z, addressing them by their first name.

REL - D (78) D uses the indicator of consequence or conclusion ("so") to refer back to and conclude the previous statements made by group members.

**Research question 1c:** *To what degree and how do interactants manifest cognitive openness in their talk?*

OP - L (36) uses hedging language- "maybe" - when proposing how to approach the task. This suggests that this is just one possible way to do it.

OP - P (50-54, 59-60) expresses the difficulty of interpreting the key phrase in the task statement. By using questioning structures, P (50-51) indicates that there is no definitive meaning for the key phrase "fully understand", but that it is debatable. P postulates (51-53) different ways in which the phrase could be understood.

OP- Z (63-65) displays openness when they declare a change of opinion from false to true, seeming to have been influenced by X's reasoning (25-28).

**Research question 1d:** *How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

The three dimensions of transactivity are extensive and combine with each other in Item 1b. X (25-28), L(35-41) and Z (70-75) all use *explicit reasoning* to offer justification of their views. Z (55) displays *relationality* when they pick up on P's query of the meaning of the word "understanding". P demonstrates *cognitive openness* as they puzzle the meaning of the task statement by using questions and hedging to convey the sense that there are different ways to interpret it. Others pick up recurrently on this same point, so *relationality* is robust throughout the Item.

## 1b.3.2 Evidence of CKC and prolongation of interaction

*Research question 2a: How is collective knowledge construction evidenced in the interaction?*

**Table 4-3 Evidence of CKC and prolongation item 1b**

Item 1b. Change, challenge, prolongation, emergence of new idea, follow-up of idea	
Change of a speaker's own view	no
Challenge of another speaker's view	yes
Prolongation of interaction	yes
Emergence of new idea	yes (4 instances)
Follow-up of idea	yes (1 instance)

#### **Change of a speaker's own view**

There is no evidence of change of a speaker's own view.

#### **Challenge of another speaker's view**

There is challenge between Z (55) and P (59-60). Z thinks it is a matter of understanding all the details and P thinks it is about understanding the main point.

#### **Prolongation of interaction**

There is prolongation of interaction around the possible meaning and interpretation of the task statement, especially due to the challenge of view displayed by Z (55) and P (59-60).

#### **Emergence of new idea**

A new idea is contributed by L (32) when they state the brief phrase "main idea".

L (35-41) contributes another new idea when they suggest visualising the text.

P's (50-54) questioning of the task statement phrase "fully understanding" contributes a new idea, in the meta sense that they should analyse the meaning of the statement before attempting to answer.

Z (70-75) contributes the double notion that it is acceptable not to read a whole article if it is difficult, and that in such as case, the importance of using key words is heightened.

### **Follow-up of idea**

Despite showing plentiful instances of relationality, with speakers contributing their views to the discussion about the meaning of the task statement, item1b does not demonstrate much follow-up in the sense of development of idea. Z (70-75) follows up to some extent when they provide an explicit rationale in response to the group dilemma but the addition of any new perspectives is limited. D (76-79) does not add anything new to the discussion when he concludes by bringing together the outcome of the discussion.

**Item 2a.1 Transcript of interaction produced by Group a in response to Statement 2 - *a summary should not be more than 25% of the original text***

01	2:21	Y:	And the second one.. (.) Eh?, hhh ((laughs)) (2.0) Sorry
02	2:26		(5.0)
03	2:31	Y:	↓Yeah
04	2:32		(4.0)
05	2:36	Y:	Ok, the second, (1.0) the second one.
06	2:40		(2.0)
07	2:42	J:	.hhh Oh well↓ eh actually, I didn't, eh I'm not very sure
08			about this one so I want to (.) hear some (0.5) points of
09			view
10	2:56		(1.0)
11	2:57	Y:	I think (0.5) maybe it's right. It's right. I think [and eh..
12	3:02	H:	[((unintelligible)) what do you think?
13	3:03		(1.0)
14	3:04	Y:	Eh.. (.) I, I guess it's right. ((laughs)) What's your opinion?
15	3:11	H:	Eh.. I think the eh that a summary we should use some
16			brief, eh brief sentences .hhh eh:: but for the eh accurate
17			length I I have no ↓idea of it
18	3:25		(1.0)
19	3:26	Y:	Yeah (3.0) hmm (3.0), so we can talk about others and this
20			one we can ask eh ↑Jenny after after our ↑discussion
21	3:38	J:	(.)↓Ok
22	3:40	Y:	Yeah, ↓ok ↓Hmmm. The third one.

## 2a.2 Talk-through

After some false starts by Y and pauses (1-6), J self-selects (7), taking up the TRP. J's turn is made up of 3 juxtaposed TCUs: first J explains that they are unsure of the task statement, and this leads on via the use of the connective adverb "so", to their elicitation of contribution from the other group members.

Y responds (11) to J's request, stating their opinion. They use the hedging phrases "maybe" and "I think" and the hesitation phrase "eh". H takes up the TRP (12) posing a direct question to Y. Y produces an SPP, comprising of a brief and externalised answer (14), before directing back to H with a direct question (14).

H (15-17) states their view and Y takes up the TRP (19-20) with a suggested solution for the group. The upwards shift (20) suggests that this proposal (to check with the teacher) is open. J (21) expresses agreement with Y's proposal and Y completes the statement. Downward shifts (21, 22) render the consensus more definite.

## 2a.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a

## 2a.3.1 Explicit reasoning, relationality, and cognitive openness

**Research question 1a:** *To what degree and how do interactants convey explicit reasoning?*

**EXP** - There are no examples of explicit reasoning.

**Research question 1b:** *To what degree and how do interactants relate to points made by other speakers?*

**REL** - Relationality is only seen in moves of speakers responding to requests to contribute (10), (15-17), i.e. these moves do not pick up on ideas expressed by others.

**Research question 1c:** *To what degree and how do interactants manifest cognitive openness in their talk?*

**OP** - There are no Items of cognitive openness.

**Research question 1d:** *How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

Of the three dimensions of transactivity only *relationality* is demonstrated in Item 2a. The *relationality* which is evidenced is superficial as it is used to fulfil the mechanics of the conversation, by responding to (15-17) another's request (10).

## 2a.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-4 Evidence of CKC and prolongation item 2a**

Item 2a. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker's own view	no

Challenge of another speaker's view	no
Prolongation of interaction	no
Emergence of new idea	yes (1 instance)
Follow-up of idea	no

### **Change of a speaker's own view**

There is no evidence of change of a speaker's own view.

### **Challenge of another speaker's view**

There is no evidence of challenge of another speaker's view.

### **Prolongation of interaction**

There is limited prolongation of interaction. In spite of J's (7-8) request that the other participants contribute their points of view to develop a discussion about the task statement, only Y and H respond, and neither of them offer any explicit reasoning of their view.

### **Emergence of new idea**

Although H (15-17) offers something new to the discussion, when they mention the use of brief sentences, there is no justification of their point.

### **Follow-up of idea**

No speaker follows up on H's idea (15-17).

**Item 2b.1 Transcript of interaction produced by Group b in response to Statement 2 - a summary should not be more than 25% of the original text**

01	7:06	Z:	Ok, mhm. The second one.
02	7:09		(2.0)
03	7:11	D:	((Speaks Chinese to roommate))
.	.	.	
.	.	.	

04	7:15		I don't think, I I'm not sure th- that the second one it n be-
05			be no more than (.) 25% or less of the (.) original text, .hhh
06			Hmm maybe it's true? What about others?
07	7:32		(2.0)
08	7:34	Z:	Yeah, I think it's true, a summary shouldn't be (.) ↓very
09			long=
10	7:39	D:	Yeah a summary should be ↓very long, ↓yeah, hmm..
11	7:44	L:	= but what if the (.) original text (.) is a little short?
12	7:50		(2.0)
13	7:52	D:	Eh [↑ahh::
14	7:55	X:	[25% is the centre::
15	8:00		(2.0)
16	8:02	Z:	Hmm:=
17	8:04	D:	=↑Maybe it's the [↑centre
18	8:07	X:	[So (1.5) I don't think [the ((unintelligible))...
19		D:	[be NO MORE THAN 25.
20	8:12	D :	The next question is (.) good, I think, if the (.) text is too
21			short maybe just 100 words (.) so we should we can just
22			write (.) 25 words ((laughs))
23	8:23	L:	Maybe ((laughs)) maybe [the original=
24	8:28	D:	[maybe so
25	8:30	L:	=it's the original
26	8:33	D:	I I don't think it it ((coughs)) I don't think it it can eh it will
27			be a standard (1.0) they (.) there, ↑eh=
28	8:43	X:	=25%
29	8:44	P:	[((unintelligible))
30	8:44	X:	[yeah because=
31	8:46	D	=Yeah, right?
32	8:49	P:	There shouldn't be a limitation about the (.) length=
33	8:57	X:	[=Yeah
34	8:58	D:	[=Yeah, yeah yeah yeah
35	9:02	X:	The worksheet ehm asked us to write a summary with 200
36			to 2-250 words but the article eh is long so I think 25% is eh
37			(3.0) [((unintelligible))
38	9:13	D:	[↑Hmm::
39	9:14	X:	The second sentence is true
40	9:18		(2.0)
41	9:20	Z:	I think (1.5) I think it's true
42	9:27	D:	You think, why why you think it's true?
43	9:34	Z:	Hmm (3.0) I I'm not sure, 25% eh of the specific standard
44			but eh I'm not sure.
45	9:46		(5.0)
46	9:51	L:	Eh [I think it's true too
47		X:	[((unintelligible))
48	9:56	D:	So:: hhh (.) if we have different opinions erm, the- how do
49			you say, the less one should obey the the more, you know
50			what I ↑mean, can we (2.0) if we (3.0), if we have different
51			opinions (1.0) cause we just have 15, 15 minutes.
52	10:27	():	((unintelligible))
53	10:28	D:	So eh Pan and me think it's false right? The number two
54			question.
55	10:36	P:	Yes (.) I think it's false
.	.	.	.

56	10:39	D:	What about Lee?
57	10:42	L:	The second one?
58	10:45	D:	Yeah, what's, what's your answer?
59	10:50	L:	Well if it is false I think the main point is 25 (.) 25
60			percentage, maybe it's the point
61	10:59	D:	↑Ahh: and Ziri thinks it's true, what about Xing?
62	11:06	X:	I think it's true cause [I think 25% (.)
63	11:10	D:	[true, ok
64	11:13	X:	Yeah ((laughs)).
.	.	.	.
65	11:14		(1.0)
66	11:15	D:	Let's go on to the the third one, we have ((laughs)) so
67			different opinions about the se- the second one.
68	11:24		(1.0)
69	11:25	Z:	Yeah: And the ↑third one ((reads statement under their
70			breath))
71			<b>LATER they return to Statement 2</b>
72	17:59	D:	Hmm:, so it's a dif a little ↑difficult ((laughs)) And we have
73			2 question, we are not ehm we are not sure. The second
74			one and the last [one
75	18:09	Z:	[The second one=
76	18:13	P:	=Yes=
77	18:14	D:	=The last one. And...Yes, the question about the second one
78			is that (.) if we have a text which is too short, for example
79			just 100 words, (.) the summary should be n- no more than
80			25%, it's a (.) it's not so...(unintelligible)
81	18:32	L:	I think the second one is a little ((speaks Chinese))
82	18:38	D:	Eh:: ((laughs))
83	18:39	Z:	Weird
84	18:40	P:	Yeah yeah yeah
85	18:41	():	Weird
86	18:42	L:	Weird, yeah kind of weird cause I don't know if we have to
87			set a eh- set a ((Speaks Chinese))
88	18:51		(1.0)
89	18:52	Z:	[A standard
90		D:	[A standard
.	.	.	.
91	18:54	L:	A standard for the number that (.) how long would the
92			summarise need to be?
93	19:02	Z:	A a limit=
94	19:04	P:	=Yes, a limit, yes
95	19:08	D:	Yeah a limit, so eh=
96	19:11	Z:	=We're not sure if there have a limitation, yeah?
.	.	.	.
97	19:17	L:	Eh, hmm, for example if the original text is 200 200 words
98			eh do we have to write the summarise in 50 50 words? What
99			if I write 60 words?= =Yeah, that's our question. And eh the second one should
100	19:31	D:	be a limit, in the in the eh (hhh) should not be a limit=
101			=Yeah, my opinion is that we should we do not need this
102	19:41	L:	limit
103			
104	19:45	Z:	=Hmm
.	.	.	.

105	19:46	P:	Yes
106	19:47	D:	Or it can be more specific? I think eh for 25% of eh 500
107			words? and bla bla bla. ↓Hmm ↓Yeah hhh That's my opinion.
108			And last one. I'm not sure. ((unintelligible))=
109			<b>LATER they return to Statement 2</b>
110	22:48	Z:	So, the second one it still confuse (.) us=
111	22:53	D:	=((laughing)) The second one. You say. (.) Yeah in your
112			opinion it's [false, in my
113	23:01	Z:	[Yes
114	23:03	D:	Yeah I agree with you. Yeah I I agree with you. There should
115			not be a limit.
116	23:10	L:	They just said should be just in general, not so specific
117	23:17	Z:	Hmm::
118	23:20	X:	Maybe the the the original text eh in second too, be a large
119			article, a long article, yeah, and maybe that, (.) so it says
120			should be more than 5%, and we think too more maybe, we
121			think too much maybe. But I I think it's false.
122	23:49		(5.0)
123	23:54	D:	So, the the second one ((recording cuts off))
124			<b>LATER they return to Statement 2</b>
125	0:02	D:	Wo-, don't care, just give a answer=
126	0:05	X:	=Ehm: maybe no more than- eh the sentence says 'no more
127			than 25%' and I think it's eh true: (.) eh it because it didn't,
128			it don't give us a a a ↑sure a su:: eh a su::re (2.0) eh
129			↓limitation, as ah:: ((unintelligible)) ((laughs)) so ((laughs))
130	0:36	D:	So:: So, yo, you think it's true?
131	0:41	X:	Yeah I think it's true, wo=
132	0:44	D:	=So Ziri, you think it's true right, is that right?
133	0:52	L:	Yes, yes=
134	0:53	Z:	=I'm not sure ((laughs))
135	0:56	D:	↓Ok. Oh we have three people think it's false, one people
136			think it's true and (.) and one people think it's not sure.
137	1:04	Z:	((unintelligible)) I don't know...=
138	1:07	D:	=So (.) so [we
139	1:09	Z:	((unintelligible))
140	1:12	D:	[=>yeah yeah< so we think the answer
141	1:16	Z:	=yeah
142	1:17	D:	>we think the answer false, ok<.
143	1:21	Z:	↓Ok (.) I agree
144	1:25	D:	So we [we finished our discussion

### Glossary of Chinese speech used in transcript

(03) - 告诉他等一会 = Tell him to wait

(82) - 奇怪 = strange

(88) - 标准 = a standard

## 2b.2 Talk-through

### Stage 1

D's (3-5) use of repeated negatives and hedging language indicates a lack of certainty. Upward pitch (6) presents D's view that the statement may be true, as a possibility for the group to consider. D's open question (7) is an FPP which invites the others to respond. Z's (8-9) SPP demonstrates their agreement with D's opinion, which is in turn reiterated by D (10), although there appears to be an error of comprehension or of the use of the modal verb (should), as Z actually states that a summary should NOT be very long and D says that it should be very long. D's use of the affirmative "yeah" with downward shift serves to affirm that D agrees with Z. L takes up the TRP (11) prefacing their turn with the contrastive conjunction: "but", which suggests that there is a conflict of opinion with D's FPP (10). D's (13) upwards pitch and lengthening of the interjection (ahh) in response to L suggests that they are now considering L's point.

X (14) introduces a new idea by taking up the numerical reference to the figure of 25%, from the task statement, and stating that it is "the centre" (a phrase which X has taken from their limited L2 range, and which is probably meant to convey that 25% is an average number). This leads to several turns where speakers address the implication of the figure of 25%; D (19), D (22), X (28). D (17) even reiterates the phrase "it's the centre".

D (20-22) voices a hypothesis using the first conditional with modals "should" and "can", to propose a way to summarise a short text.

D (27) introduces the concept of a standard, and whether this exists or not when writing a summary.

P (32) introduces the notion of limitation in the length of a summary.

X (35-36) refers to a shared resource which is a worksheet task which the students had completed previously, during the course (35). X explains that because the

article in that worksheet task was long, and they had to write a summary of 200-250 words, this figure proportion aligns with the premise of the current task statement; that of a summary should not more than 25% of an original text. They use the contrastive conjunction “but” to structure their argument. X is interrupted by D (38) but takes up their turn again (39), consolidating their concluding point that the statement is true.

Z (41) states that the statement is true, and D (42) asks them to explain their rationale, posing a direct open question to their, as a FPP. Z’s SPP consists of a reference to the figure of 25% and the notion of standard, yet no explanation is provided. Similarly, L (46) offers no elaboration of their view that the statement is true.

D (48-51) makes a summary statement of the collective opinion, using the deontic modal “should” to suggest that since there is no consensus of opinion, the group should take a decision on their collective answer according to the majority view. D infers (51) that the time to complete the task is running out and that they must reach a decision.

Lines (53) to (63) consist of D convening the group members’ answers, one by one, using their individual names. In response to D’s FPP, L (59-60) uses the discourse marker “well” to preface their SPP, which leads on to some explanation where they use the conditional “if it’s false”, as well as the hedging structures: “maybe” and “I think” to explicate their view that the main factor is the figure of 25%. D (61) responds with an upward shifted interjection - “ahh”, directly followed with the naming of other members of the group. They reminds the group of Z’s view (61) before asking X, using their first name. X (62) responds to D, using the subordinate conjunction “cause” to explain why they believe that the statement is true, referring to the figure of 25%.

## Stage 2

Returning to the discussion of the statement, after working on the other task statements in the interim, D (72-74) reminds the group about Statement 2, summarising the main issue that they had been discussing previously and about

which they had failed to reach a consensus. They provide an example (79-80) of what a short text may be.

L (81) interrupts D using a Chinese expression (translation= strange) to describe the statement. Z (83) provides a translation of the Chinese word, backed up by P (84), who produces the triple affirmative, and another interactant (85).

Taking up their group mates translation (weird), L (86-87) explains why they think it is weird, relating this explanation to a second Chinese word, which Z and D translate (89, 90) as “standard”. L (91-92) uses the translation provided by Z and D, to recuperate their turn, which leads to the posing of a question about the necessary length of a summary, if a standard is applied.

Z, P and D (93-95) converge in their use of the word “limit”.

Z (96) voices the group’s collective uncertainty around the issue of there being a limit. The upward shift on the adjunct “yeah” at the end of their TCU, keeps the topic active in the group discussion space and renders their turn a FPP to which L (97-99) takes up the the TRP to respond, formulating a hypothetical question (98-99) for the group, by asking if a summary should be 50 words if an original text is 200 words. The use of the “what if” structure by L presents a direct dilemma for the group to ponder.

In response, D comes straight in (100) using the collective possessive pronoun “our question” to emphasise that this is a challenge shared by the whole group. The use of the negated modal should by both D (101) and L (102-103) shows convergence of opinion, and both Z (105) and P (106) voice agreement with D and L. D (107) introduces a new idea about specific numbers, which they pose as a question. However, D does not fully explain this point, and resorts to the use of the phrase “bla bla bla” (107), completing the discussion of the statement with the closing phrase “That’s my opinion”, before going on to re-introduce the discussion of the statement.

D (106) takes up the TPR to make the distinction between the notions of general and specific. L (116) refers back to this notion by reporting what was said by the group “they just said...”.

X (118-121) suggests that it could be a long article and that they might be thinking that a percentage comprising 5% of the original is too long for a summary paragraph.

D (125) pushes the group towards deciding on their collective answer. X (126-129) returns to the debate on 25%, quoting from the text of Statement 2, using the full nominative (the sentence) instead of a pronoun.

D (130, 132) poses confirmation questions to X and Z about their respective views of the statement. This tactic does not lead to a fully conclusive group consensus, as although X confirms that they think the statement is true, Z is unsure.

D (135-136) provides a summary of the statistical breakdown of opinions of the group members, in what appears to be a claim that they should follow the majority opinion, just as they did in (48-51). D uses the collective subject pronoun “we” combined with more impersonal language: “3 people”, “1 people” etc.

### **2b.3 Interpretation - Research questions 1a, 1b, 1c and 1d**

#### **2b.3.1 Explicit reasoning, relationality, and cognitive openness**

*Research question 1a: To what degree and how do interactants convey explicit reasoning?*

**EXP-** D (20-22) develops L’s (11) point about an original text being short, by providing hypothetical numerical data about the length of texts, and the required proportionate length of summary paragraphs.

**EXP-** X (35-36) X provides an explanation based on reason and consequence, inferring that the summary which the group had written in a previous task, was under 25% of the article that they were working with. Thus they provide a precedent to serve the group in the current task of deciding whether the statement is true or false.

**EXP- D (79)** paraphrases the group's earlier dilemma about the limit of 25% for a summary text. They use the first conditional tense to present a test case of having to summarise a short original article. Since the first conditional evokes a real or future possibility, it may make the group may identify more effectively with D's scenario.

**EXP- L (98-99)** introduces a hypothesis framed by the question: 'what if...', which puts the group in the position of having to mentally calculate percentages and to think about proportion.

**Research question 1b:** *To what degree and how do interactants relate to points made by other speakers?*

**REL - D (12)** voices the interjection of surprise (↑ahh:) in response to L, which suggests that D is pondering L's point, which they had not thought of before.

**REL- D (20-22)** uptakes and develops L's (10) point about an original text being short.

**REL- X (35-36)** refers to a shared object for the group, the worksheet.

**REL- Z, P and D (94-96)** converge in their use of the word 'limit'. This mention of the word 'limit' links back to P's earlier mention of the concept (32).

**REL-** The recurrent referent of the words "limit" and "standard" by D (27), Z (43), Z (90), D (91), and L (92), constitutes a constant link between speakers.

**REL-** D responds (101) to L (99-100) with an adjacent pair, using the collective possessive pronoun to voice a summary of L's argument "yeah that's our question".

**Research question 1c:** *To what degree and how do interactants manifest cognitive openness in their talk?*

**OP- L (11)** opens a new dimension in the debate, when they posit that an original text could be short.

OP- D's (13) upwards pitch and lengthening of the interjection (ahh) in response to L suggests that they are considering L's point.

OP- L's upward shift on their statement (98-99) and on the adjoining open "what if" question (99-100), positions the dilemma in the group space, as a question which the group members must ponder to be able to answer.

OP- D (107) introduces the new idea that there could be a specific limit to the word count in a summary, by using the modal "could" this is presented as possible alternative to the notion that there is no limit on the words.

**Research question 1d:** *How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

The three dimensions of transactivity combine in the interaction in Item 2b. D's turn (20-22) displays both *explicit reasoning* and *relationality* when he follows up on L (11), who has displayed *cognitive openness* in presenting a new notion of the possibility that the original article could be very short to the discussion.

X (35-36) displays *explicit reasoning* and *relationality* when following up on previous speakers' turns about the length of the summary paragraph, they provide a tangible example by referring to a shared object which is the worksheet.

D (107) combines all three dimensions of transactivity. The use of "or" as the initial word in their TCU, clearly operates on something that has been stated earlier, so *relationality* is present. *Cognitive openness* is conveyed by both the modal "could" and the use of "or", and *explicit reasoning* is expressed through the use of perspicuous lexis ("explicit") and a tangible numerical example for others to focus on (25% of 500).

### 2b.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-5 Evidence of CKC and prolongation item 2b**

Item 2b. Change, challenge, prolongation, emergence of new idea, follow-up of idea	
Change of a speaker's own view	no
Challenge of another speaker's view	yes
Prolongation of interaction	yes
Emergence of new idea	yes (10 instances)
Follow-up of idea	yes (9 instances)

### **Change of a speaker's own view**

There is no evidence of change of a speaker's own view.

### **Challenge of another speaker's view**

There is the suggestion of challenge from L (11) when they use the contrastive cohesive device "but" to propose an alternative scenario, to the point made by D (10) that a summary should be long. L uses "if" to pose the question "what if" to plant the notion that the original article could be short in length.

### **Prolongation of interaction**

Extensive explicit rationale, relationality and openness as well as abundant instances of NI, lead to a prolonged discussion.

### **Emergence of new idea**

There is emergence of new idea when L (11) plants the notion of writing a summary for a short original text,

Another new idea is contributed by X (14) who says that 25% is at the centre, in other words that 25% is an average amount.

D (20-22) embodies something new as they posit the hypothesis of a text of 100 words, posing the question of whether a summary paragraph of that would be 25 words.

L (23) introduces a new idea by referring to the original text.

D (26) suggests another new idea that there is no standard length.

P (32) introduces the lexis “limitation” to articulate the notion that there should not be a limit to the number of words in a summary paragraph.

X (35) introduces a new dimension by referring to the shared source, the worksheet.

L (97-99) forms another numerical hypothesis, using a different number from previous contributions.

D (106-107) highlights the notion of using a specific number to summarise depending on the length of the original.

X (118-119) presents a scenario that the article to be summarised is very long, and suggests that in this case they may feel that a percentage of 5% might still be too long for a summary paragraph.

### **Follow-up of idea**

Throughout this Item there is a thread of contributions which serve to develop the central topic of whether the number of words used in a summary paragraph should amount to no more than 25% of the original text. D (13) displays surprise in response to L (11) and this is followed by upwards pitch and lengthening of the interjection (“ahh”) which implies that D is considering the implications of the idea raised by L (11), that an original article could be short. This leads on to the discussion of what 25% really means, with X (14) following up on others’ (Z, D, L) ideas of what is long and short, by proclaiming that this is an average number (“at the centre”).

It is much later in the Item that group members develop P’s (32) claim that there should not be a limit to the number of words in a summary paragraph. In lines (87-103) the topic is discussed with speakers using a range of creative discourse, including reversion to translating to their shared first language to determine the meaning and sense of the notion.

When, at a later stage in the discussion of Statement 2, D (114-115) returns to the notion that there should not be a limit on the number of words, L (116) develops this point by using a reporting structure to backchannel on previous turns expressed in the group “they just said should be just in general, not so specific”. By introducing this nuanced dimension about generality and specificity, L widens and fortifies the notion that there should be no limit on the number of words for a summary paragraph.

**Item 3a.1 Transcript of interaction produced by Group a in response to Statement 3 - *a summary can be made in just one sentence***

01	3:50	Y:	↓Hmm (.) the third one.
02	3:54	J:	.hhh Ehm, well in my opinion eh:: it definitely could be
03			summarised in one sentence cause eh ah I eh I eh if if we can,
04			if we can summarise all the meanings we want to express from
05			original texts, eh we can do it in ehm...
06	4:17		(3.0)
07	4:20	Y:	↓Hmm yeah I ((unintelligible)) but I think it eh it maybe it's
08			more difficult to just eh [((laughs)) just in one sentence, yeah
09	4:30	J:	[Yeah ((laughs))
10	4:32	X:	So it said it's possible to summarise we (.) should try that to
11			.hhh eh make to do this but if we can not, eh we can [use eh
12			(.) eh several sentences
13	4:42	():	[Yeah.
14	4:43	J:	Yes, I agree with you
15	4:47	Y:	=Hmm
16	4:48	():	[((unintelligible))
17	.	S:	[Yeah, and I think
18	4:52	():	=Oh ↓oh
19	4:54	S:	=((laughs)) ↓Sorry ((laughs))
20	4:56		(3.0)
21	4:59	X:	Hmm
22	5:01	Y:	Eh?
23	5:03	X:	Good, pardon? ((unintelligible))

**3a.2 Talk-through**

J (2-5) uses the subordinate “cause” to lead into an explanation of their view, which includes hypothesis through the use of the modal conditional (2) The use of

the passive voice creates a sense of distance and objectivity about how the task of summarising should be approached. There is triple use of the more direct first conditional with the deontic modal phrases “if we can” (3) (4), ‘we can’ (5), renders their proposed course of action more real, especially since they has changed the use of the passive voice for the personal subject pronoun “we”.

Y’s use of the contrastive conjunction, “but” (7), suggests that there may be an issue of conflict with J’s explanation. J (9) supports Y both by their affirmative utterance “yeah”, and by laughing.

X (10) uses the deontic modal “should” and then the first conditional: “if we can not, eh we can” (11) which conveys another available course of action if the first option does not work. Launching their turn with the use of the opening discourse marker “so”, X uptakes J and Y’s joint contributions to the group challenge of working out the answer to the task statement. X’s use of “it said” brings the group’s attention to the task statement, the shared point of reference. The other interactants express agreement with X (13,14,17). There is some overlapping (16-17) as interactants S and X clash at the next TRP.

### **3a.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a**

#### **3a.3.1 Explicit reasoning, relationality, and cognitive openness**

*Research question 1a: To what degree and how do interactants convey explicit reasoning?*

**EXP** - J (3-5) explains rationale for why the statement is true, using the causal conjunction “cause”.

**EXP** - X employs the reporting structure “it said” to refer to the shared object of the statement. This embodies explicit reasoning.

*Research question 1b: To what degree and how do interactants relate to points made by other speakers?*

**REL** - The use of the discourse marker “so” as an opener to their turn (10), allows X to connect up to J’s (2-5) and Y’s (7-8) turns.

**Research question 1c:** *To what degree and how do interactants manifest cognitive openness in their talk?*

**OP** - J (3-5) employs hypothesis to present their view that the statement is true, and follows this with the conditional structure with the deontic modal “can” to develop their point further.

**OP** - X (10-12) probes the meaning of the task statement, adding nuance with their shared analysis of the text in the statement, emphasising the notion of possibility, and going on to extend this by using the first conditional to convey that the group can take an alternative course of action, if the first is not possible.

**Research question 1d:** *How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

Item 3a combines the dimensions of *cognitive openness* and *explicit reasoning* when J (3-5) expresses possible courses of action. X (10-12) shows *explicit reasoning* combined with *relationality* when they refer back to the course content in order to operate on what J and others have said earlier.

## 3a.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-6 Evidence of CKC and prolongation item 3a**

Item 3a. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker's own view	no
Challenge of another speaker's view	yes
Prolongation of interaction	yes
Emergence of new idea	yes (2 instances)
Follow-up of idea	Yes (2 instances)

#### **Change of a speaker's own view**

There is no evidence of change of a speaker's own view.

#### **Challenge of another speaker's view**

Y (7-8) challenges J (2-5), as they posit the antithesis of what J had suggested; Y thinks that one sentence would be too minimal to be able to express an entire summary of an article, whilst J had explained that in their view, it would be possible. This constitutes a moment of challenge.

#### **Prolongation of the interaction**

Extension of the discussion of this Item comes from X (10-12), who interprets the meaning of the task statement itself, which they reports and paraphrases, using their own phrase 'it's possible' to substitute the modal verb "can", redacted in the task statement (10). They explain (11,12) what this means in practice for the students faced with a summarising task; that there is the ideal of what they "should" do, but that this is not compulsory; for there is another option if the ideal process of reducing the summary to only one sentence is not possible.

#### **Emergence of new idea**

X's turn (10-12) constitutes a new idea, when they interpret the task statement and use this to propose how the group might evaluate the task statement and its implications for their approach to summarising.

### Follow-up of idea

Y (7-8) follows up on J (3-5), and X (10-12) follows up on J and others. However X's (10-12) idea is not followed up by others.

### Item 3b.1 Transcript of interaction produced by Group b in response to Statement 3 - *a summary can be made in just one sentence*

01	11:22	D:	Yeah yeah the the third the ↑third one ((reads the question under their breath)) Yeah, it's ↓false it (.) it's completely
02			false. Just a ↑single sentence::
03			
04	11:32	P:	Yes, it's false definitely=
05	11:34	D:	=You sure? a single sentence can't summarise a research
06			paper
07	11:41		(3.0)
08	11:44	X:	↓Hmm I think that one's true- eh- it's false=
09	11:45	D:	=Yeah, [yeah, yeah
10	11:47	Z:	[I think it's [false
11	.	P:	[Yes,
12	11:50	D:	[Everyone think it's-
13	11:53	Z:	[Another one (.) yeah, another one

### 3b.2 Talk-through

D (2) voices a double TCU, statement (02), using the adverb 'completely' to intensify their view that the statement is false. D's upward shift (3) and the use of the determiner 'single' to replace the numeric 'one' in the task statement, combined with their lengthening of the final word of their TCU (sentence::), adds a level of openness to their view. P (4) takes up the the TRP to agree robustly, emphasising their certainty by adding the adjunct "definitely" at the end of their TCU. The unexpected challenge when D poses an ad hominem direct question to P (5) contrasts with the view expressed by D himself in line 2, and demonstrates that they are considering the possibility that the task statement is not false after all.

By voicing doubt (5) on the view expressed by P (4) and by himself (2), D creates an opportunity for others to consider validity of their initial claim. In response to this direct challenge, and following a pause of 3 seconds, X takes up the TRP (8) to opine that the task statement is false, which is followed by D's endorsement (9) of X, expressed as a triple affirmative "yeah". Z (10) also agrees and they reach a consensus.

D (12) attempts to summarise the group's collective agreement but this is incomplete, as D is interrupted by Z (13).

### **3b.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a**

#### **3b.3.1 Explicit reasoning, relationality, and cognitive openness**

*Research question 1a: To what degree and how do interactants convey explicit reasoning?*

**EXP** - There is an absence of explicit reasoning, as no speaker offers any explication of their view, or of their agreement or challenge to others' views.

*Research question 1b: To what degree and how do interactants relate to points made by other speakers?*

**REL** - Whilst there is some relationality as speakers respond to each other's FPPs, these turns do not develop into anything which could be described as expansion of the discussion.

*Research question 1c: To what degree and how do interactants manifest cognitive openness in their talk?*

**OP** - Not only are there few indications of openness in this Item, but the use of enhancing language such as "completely" (2) or "definitely" (4), produces a closed effect. There is no recognition of alternative views.

**Research question 1d:** *How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

Item 3b shows little transactivity with only *relationality* being in evidence when D (5) picks up on P's (4) turn.

### 3b.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-7 Evidence of CKC and prolongation item 3b**

Item 3b. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker's own view	no
Challenge of another speaker's view	yes
Prolongation of interaction	no
Emergence of new idea	no
Follow-up of idea	no

#### **Change of a speaker's own view**

There is no evidence of change of a speaker's own view.

#### **Challenge of another speaker's view**

There is some evidence of challenge of another speaker's view when D voices doubt (5-6) on the view expressed by P (4) and by himself (2). This is not pursued further and agreement is quickly reached.

#### **Prolongation of interaction**

There is no prolongation of interaction.

#### **Emergence of new idea**

There is no emergence of new idea.

### Follow-up of idea

Whilst there is relationality in this item, when D (5) picks up on P (4), there is no demonstration of development of view, nor is there any evidence of new idea.

#### Item 4a.1 Transcript of interaction produced by Group a in response to Statement 4 - *a summary can not contain direct quotes*

01	5:10	S:	Ehm, ok ((laughs)) eh, can you hear me?
02	5:14	():	Yeah, yes
03	5:16	S:	Yeah ok. A summary can not contain... eh maybe I think eh it's
04			right eh because we just eh summarise the main point of the
05			quotation or the original sentence, so we shouldn't eh ehm
06			use it ↑directly.
07	5:40		(1.0)
08	5:41	Y:	Yeah I agree with you ((laughs))
09	5:46	S:	Yeah ((laughs)) ↓ok (1.0) so ↑next one

### 4a.2 Talk-through

S (3) states their opinion that Statement 4 is correct but they do not delay in explaining their view. S uses the subordinate conjunction “because” (4) to link to a explication, within which the collective group is implicated, through the repeated use of the pronoun “we”. The use of the softener “just” (4) allows S to communicate their stance, that the action to be taken by the group is a simple one. The complementary concluding clause is introduced by the resultative “so”, which prefaces the deontic modal to indicate what the group should do “we shouldn't...” (5). Y (8) expresses their agreement with S, and S (9) announces the next task statement.

### 4a.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a

#### 4a.3.1 Explicit reasoning, relationality, and cognitive openness

**Research question 1a:** *To what degree and how do interactants convey explicit reasoning?*

EXP - S (3-6) provides explicit reasoning for their view, with the use of subordinate conjunctions such as “because” (4) and “so” (5). S introduces a solid rationale which highlights that when focusing on the main point of a text, a summariser should not use direct quotes.

**Research question 1b:** *To what degree and how do interactants relate to points made by other speakers?*

REL - Y (8) relates to S (3-6), and S (9) relates to Y (8), but there is no epistemic uptake in the form of challenge to viewpoint, or of additional points being made.

**Research question 1c:** *To what degree and how do interactants manifest cognitive openness in their talk?*

OP - there is no demonstration of cognitive openness.

**Research question 1d:** *How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

Although there is evidence of *explicit reasoning* and *relationality* in Item 4a, transactivity is affected by the fact that only one speaker (S) justifies their view, and whilst Y (8) relates to this, their response lacks any explanation.

#### 4a.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-8 Evidence of CKC and prolongation item 4a**

Item 4a. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker's own view	no
Challenge of another speaker's view	no
Prolongation of interaction	no
Emergence of new idea	yes
Follow-up of idea	no

### Change of a speaker's own view

There is no evidence of change of a speaker's own view.

### Challenge of another speaker's view

There is no evidence of challenge of another speaker's view.

### Prolongation of interaction

There is no prolongation of interaction.

### Emergence of new idea

S (3-6) contributes the idea that they should paraphrase information from sources rather than quote directly.

### Follow-up of idea

There is no follow-up of idea. Although there is evidence of relationality in Y's (8) response to S (3-6), *relationality* is perfunctory with speakers not engaging with others' views. There is no epistemic uptake in the form of challenge or development of S's viewpoint, and no additional points are made.

**Item 4b.1 Transcript of interaction produced by Group b in response to Statement 4 - a summary can not contain direct quotes**

01	11:51	D:	((speaking under their breath)) Not contain any direct (3.0)
02			(.hhh) ↓Ah!

03	12:00		(1.0)
04	12:01	Z:	[Any direct ↑quotations
05	12:01	D:	[Can not (.) contain (.) any (.) direct (.) ↑quotations=
06	12:08	L:	=False. I I think it's false because eh I remember I I don't
07			know if I'm right but I remember eh it mentioned before, that
08			a summary can can take some eh quoe ↓quotations
09	12:23	Z:	Hmm
10	12:24	D:	Quotations is ehm some like an eh ex example it can eh make
11			your summary ↑more clear ↓I think.
12	12:31	Z:	Hmm=
13	12:32	P:	=Oh yes
14	12:34	X:	Yes, I agree with you
15	12:38	D:	So it it's false [yeah?
16	12:41	Z:	[↓Yeah
17	12:42	D:	And the second o- and and the next one?

#### 4b.2 Talk-through

L (6) launches the epistemic level of this discussion Item, by making an unhedged claim that Statement 4 is false. They expresses this in their first TCU which consists of one word: “false” (6). Then L continues their turn, leaving no pause before starting a new TCU (6-7), where they use the subordinate conjunction, “because”, to link to an explanation of their view. L (6-7) maintains tentativeness with hedging structures: “I think”, “I don’t know if I’m right”, and uses a three part structure; statement of belief, followed by the justification for their thought. They refers to the course work (7) using the impersonal distancing structure “it mentioned” which brings a shared reference into the group discussion space.

D (10) responds to L by offering a definition of ‘quotations’. D adds the hedging phrase “I think” (11) at the end of their turn. D uses both upward (11) “more clear” and downward shift (11) “I think”.

P’s “oh yes” (13) and X’s (14) “Yeah, I agree with you” are SPPs to D (10-11). D (15) uses the resultative linking adjunct “so” to frame a conclusion about what the group has decided. D uses upward shift on “yeah” (15) which functionalises their turn as a question or FPP, which is effective, as Z (16) responds to D, using the affirmative of agreement “yeah”, which is spoken with a downward shift.

D (17) moves the group on to the next statement in the task.

### 4b.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a

#### 4b.3.1 Explicit reasoning, relationality, and cognitive openness

*Research question 1a: To what degree and how do interactants convey explicit reasoning?*

**EXP-** L's turn (6-8) is explicit, as they relate the statement to the shared point of reference for the group; the course content by using the linguistic devices "I remember" and "it mentioned before". The elliptical use of the pronoun "it" binds the group members' focus to knowledge presented in the course material.

**EXP-** D's turn (10-11) includes two indicators of explicitness; first, introducing a new idea to the group discourse about the statement, they provide a definition of the word "quotations" (10), then (11) they make a robust claim to justify the use of quotations: ("it makes the summary more clear").

*Research question 1b: To what degree and how do interactants relate to points made by other speakers?*

**REL-** D (10-11) picks up on L's (6-8) point, reiterating their word "quotations" and building on it by first offering a definition of the term, and then by contributing their reason why it is important to use quotations when writing a summary.

*Research question 1c: To what degree and how do interactants manifest cognitive openness in their talk?*

**OP-** D (10-11) widens the scope by using an example and using the modal "can" to express the act of using a quotation in a summary paragraph.

*Research question 1d: How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

Explicit reasoning is combined with both relationality and cognitive openness by D (10-11) who provides a definition of the word "quotations", as a way of

operating on L's (6-8) point. D's suggestion is that the use of quotations can make a summary more clear. The choice of the deontic modal "can" (10) as well as the hedging phrase "I think" (11) allows D to create scope for other possibilities, thus cognitive openness is conveyed.

#### 4b.3.2 Evidence of CKC and prolongation of interaction

*Research question 2a: How is collective knowledge construction evidenced in the interaction?*

**Table 4-9 Evidence of CKC and prolongation item 4b**

Item 4b. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker's own view	no
Challenge of another speaker's view	no
Prolongation	yes
Emergence of new idea	yes
Follow-up of idea	yes

##### **Change of a speaker's own view**

There is no evidence of change of a speaker's own view.

##### **Challenge of another speaker's view**

There is no evidence of challenge of another speaker's view.

##### **Prolongation of the interaction**

The combination of L's (6-8) explicit reasoning (with a reference to shared sources) and openness conveyed by the frame "I don't know if I'm right", leads to prolongation of the interaction. D (10-11) prolongs the interaction by expanding L's (6-8) point.

##### **Emergence of new idea**

D (10-11) adds a nuance to the discussion by providing a definition of the word introduced by L (8) “quotation”.

### Follow-up of idea

By suggesting that an example is a type of quotation, D (10) contributes a new idea to follow-up and builds on L’s (6-8) turn.

### Item 5a.1 Transcript of interaction produced by Group a in response to Statement 5 - *a summary should contain all the information of the original text*

01	5:45	S:	↑So::, next one ((reads question 6 aloud)) (1.0) Eh (.) for me, I’m confused about this ((laughs)) Ehm [sometimes-
02			
03	6:00	Y:	[Number 6?
04	6:03	S:	(.) >Yeah yeah<, >next ↓one<, >the information< (.) should be given in the same order as the original ↑article. (1.0) Eh maybe sometimes we could follow the article’s structure ↑to summarise but sometimes maybe we can post the conclusion at first, or:: ((laughs)). What about you?
05			
06			
07			
08			
09	6:28		(1.0)
10	6:29	Y:	Er::: it’s this one right?
11	6:32		(6.0)
12	6:38	J:	So argh which one uhm? are we talking about?
13	6:45	Y:	The- (3.0) [this one
14	6:50	J:	[Eh this one right?
15	6:54	Y:	Ok, eh: maybe we m- (2.0), we missed it before ↑Uh huh, yeah- and this one I think eh it’s not true (2.0) if we contain all the information, eh, the the ehm, just as said in the second one ehm, there are some limits in the words.
16			
17			
18			
19	7:13		(1.0)
20	7:14	J:	Yes, and eh I also think eh ehm we don’t need to contain all the information cause we eh, for example we only want to use eh one of the one point of the original text, we can only eh like only quote this one and eh we don’t need to eh use all the information from the original text.
21			
22			
23			
24			
25	7:42	Y:	↓Yes=
26	7:43	L:	=I agree with you↓
27	7:46	Y:	Hmm
28	7:48	L:	Can you hear me?
29	7:50	J:	Yes
30	7.52	L:	↑Ok. Eh::: I want to say eh maybe we can that we can eh write the eh we can summarise the key information but not all information (.hhh)
31			
32			

33	8:06	A:	Yeah I ↓think summary is meant to pick of some the ↓main
34			points to ↓summarise: (.) ↑yeah
35	8:15	H:	Eh, I think the summary should include the main eh main topic
36			and eh eh conclude conclude and some method to eh prove
37			this topic (.) eh but some eh but some (.) for example the
38			statistical data is not eh is not necessary to eh writing the
39			summary
40	8:33	Y:	↓Yes, ↓hmm.

### 5a.2 Talk-through

S (1-2) shares their confusion about the task statement but is interrupted by Y's logistical query (3), when starting to provide an explanation for this uncertainty. They have to take up the the

TRP again and explain (4-7) the motive for their confusion, which is related to the ordering of points. S uses a parallel structure to lay out two possible methods for ordering when writing a summary; each of these options is presented with hedged language: "maybe sometimes we could" (5,6), "sometimes maybe" (7). The conjunction "or" (7) is extended but is not followed by any complement, so what might follow is left vacant, adding to the sense of openness. The direct and open question: "What about you?", at the end of S's turn (8) invites others to contribute their views on their explanation.

Lines 10-14 are occupied with the logistical issue of which task statement the group should be discussing, as there has been some confusion about this. Logistical issues are intermingled with the cognitive discussion of meaning in this Item.

Y(15) tries to repair the logistical misunderstanding before goes on to discuss Statement 5.

First, Y (16) reveals their opinion, and uses a first conditional clause to suggest a scenario where all the information is included. They follows the hypothetical clause up by producing a complementary clause in the form of a back-channelling framing structure (17-18) ("just as said in the second one"), which relates back to the group's discussion of Statement 2, which has taken place ten minutes earlier, and which focuses on the notion that a summary should be a limited length. Thus, Y uses the shared reference of a previous group discussion, to support their inference that they should not include all the information.

J (20) first endorses Y's explanation, using the affirmative "yes". The use of the adverbial "also", complements J and reinforces their agreement with Y, as they continues their turn, which consists of explaining their rationale. The use of "we can" presents the situation as a realistic possibility for the collective interactants. J stresses that the group has options when proceeding to write summary paragraphs, by using twin phrases "don't need..." and the emphatic "all". J uses the meta phrase "for example" to illustrate their rationale.

L (26) also offers a clear response of agreement. L (30-32) expands the interaction, introducing the lexis "key information" to explain their view of how an article should be summarised.

A (33-34) contributes using the affirmative, "yeah" (31), and adds a further subtle point to justify the group's consensual view. By using the verb "pick", they introduce a new idea of selection.

H's (35-39) contribution, agrees with the consensual view, and adds a new dimension in the form of the suggestion to include information about methodology in the summary. They use the meta phrase "for example" (37) to help make the point that statistical data should not be included in a summary.

Y (40) downward intonation on the affirmative seems to approve H's point.

### 5a.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a

#### 5a.3.1 Explicit reasoning, relationality, and cognitive openness

*Research question 1a: To what degree and how do interactants convey explicit reasoning?*

**EXP** - Y's explicit mention of a previous task statement (17) connects to a shared point of reference.

**EXP** - J (20-24) shares a rationale of their view. They use the adverbial "for example" to explain (21) a hypothesis conveyed by the conditional zero with the

modal “can”. Introducing their explanation with the causal conjunction “cause” (21).

**EXP** - Like J (20), H (35) uses the adverbial, “for example”, to provide a tangible demonstration of what would not be included in a summary, i.e. “statistical data”.

**Research question 1b:** *To what degree and how do interactants relate to points made by other speakers?*

**REL** - Y (15) refers to previous collective group activity by using the collective pronoun “we” with the past tense verb “missed” and the adverbial “before”. They (17) also report back to the discussion of a previous task statement (“just as said in the second one...”) which embodies transactive relationality.

**REL** - J (20-24) picks up and adds to Y’s (15-18) argument. The multiple use of the collective pronoun “we” (20, 21, 22, 23) implicates the whole group in the imaginary action described by J. Using the adverb “also” (20), J elaborates on Y’s point by contributing an example to illustrate their point that there is a word limit in a summary text.

**REL** - L (31-32) picks up on J’s point, using the same adverbial (“all”), with emphasis created by stressing the word, in the recursive phrase “not all the words”.

**Research question 1c:** *To what degree and how do interactants manifest cognitive openness in their talk?*

**OP** - S (5-7) offers two possible methods for ordering items when summary writing. Hedged language adds to the notion that there is something to be contemplated, and there is an opportunity to do just that when S (8) poses an open question to the group (“What about you?”).

**Research question 1d:** *How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

Y (16-18) combines *explicit reasoning* with *relationality* by referring back to a shared object comprising a task statement which the group had discussed previously.

J (20-24) combines *explicit reasoning* with *relationality* when they use an example to illustrate the point they make to pick up on Y's turn (16-18).

L's (30-32) proposal embodies *cognitive openness* within *relationality* as they pick up on the others' contributions about including all or only some of the words in a summary paragraph.

### 5a.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-10 Evidence of CKC and prolongation item 5a**

Item 5a. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker's own view	no
Challenge of another speaker's view	no
Prolongation of interaction	yes
Emergence of new idea	yes (6 instances)
Follow-up of idea	yes (3 instances)

#### **Change of a speaker's own view**

There is no evidence of change of a speaker's own view.

#### **Challenge of another speaker's view**

There is no evidence of challenge of another speaker's view.

#### **Prolongation of interaction**

The discussion is extended by J (20-24) who adds to Y's argument by contributing an example to illustrate that there is a word limit in a summary text.

**Emergence of new idea**

A new idea emerges in (5-8) when S suggests that there are possibilities regarding the order of points in a summary. By completing their turn with an open question, S (8) creates a space for others to give their opinion.

Y (17-18) introduces a new idea that there are limits in the number of words to be used in a summary.

J (20-24), introduces a new idea that they should only use information related to the main point that they are summarising.

A (33-34) introduces the new idea to make a selection of points to include in a summary.

Emergence of new idea is presented by H (36) who introduces the notion that a summary should include a method to prove a topic.

H (38) introduces a second new idea when they say that statistical data is not a necessary component in a summary.

**Follow-up of idea**

Item 5a displays some evidence of follow-up of idea. When J (20-24) adds to Y's point (16-18) by contributing an example to illustrate that there should be a word limit in a summary text. L (31-32) adds nuance to J's point by using word stress for emphasis in the phrase "not *all* the words".

**Item 5b.1 Transcript of interaction produced by Group b in response to Statement 5 - *a summary should contain all the information of the original text***

01	12:38	D:	And the second o-, and and the next one? (1.0) Oh it's [false
02			yeah
03	12:43	Z:	[↓I think it's false:: Yeah
04	12:49		(2.0)
05	12:51	D:	We [can't we can't eh ((unintelligible))
06	12:53	Z:	[A summary shouldn't contain many details, yeah
07	13:01	P:	We just need eh the eh ((unint)) main [the key information,
08	13:08	D:	[The key, the key information, yeah=
09	13:14	P:	=↓Just key information
10	13:17	D:	The next one:: the information and ideas should be given in
11			the same order.

**5b.2 Talk-through**

D (1) declares that Statement 5 is false. Z (2) substantiates D's opinion.

By using the collective subject pronoun "we" (5) with the negative deontic modal, "can't", D starts to offer an explanation for their view, using the collective subject pronoun "we". However, due to Z's overlap (6), the rest of D's turn (5) is unintelligible.

Z's turn (6) declares the opposite of the task statement, that a summary should not contain many details.

In parallel with D (5), P's introduction of the phrase "key information" (7) helps to paraphrase the idea previously communicated by Z (6). P's use of the softener "just" (7) has the effect of reducing the difficulty of what the group has to do when summarising.

By using exactly the same phrase just used by P (7), "the key information", D (8) operates on P's point. P (9) takes up the turn, reusing the softener "just" which emphasises the simplicity of what has to be done and the downward shift indicates assurance.

### 5b.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a

#### 5b.3.1 Explicit reasoning, relationality, and cognitive openness

*Research question 1a: To what degree and how do interactants convey explicit reasoning?*

**EXP** - Explicit reasoning is represented by the clarity of P's (7) language, when they opt to use the synonym "key" for the word "main", and reiterate the collocation "key information" (9) in tandem with D (8).

*Research question 1b: To what degree and how do interactants relate to points made by other speakers?*

**REL** - P's introduction of the phrase "key information" (7) picks up on the idea introduced by Z (6).

**REL** - By using exactly the same phrase just used by P (7), "the key information", D (8) operates on P's point.

**REL** - P (9) picks up on previous turns by D and their own turn, by repeating the lexis "key information".

*Research question 1c: To what degree and how do interactants manifest cognitive openness in their talk?*

This item does not show any evidence of cognitive openness.

*Research question 1d: How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

Item 5b shows evidence of *explicit reasoning* fused with *relationality* although this is limited to recursive language or a simple paraphrase comprised of the use of "key" to replace "main", there is no evidence of *cognitive openness*.

## 5b.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-11 Evidence of CKC and prolongation item 5b**

Item 5b. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker's own view	no
Challenge of another speaker's view	no
Prolongation of interaction	yes
Emergence of new idea	yes (2 instances)
Follow-up of idea	Yes (1 instance)

#### **Change of a speaker's own view**

There is no evidence of change of a speaker's own view.

#### **Challenge of another speaker's view**

There is no evidence of challenge of another speaker's view.

#### **Prolongation of the discussion**

Prolongation of the discussion of Statement 5 is achieved by the reiterated use of the phrase "key information" between lines (7-9).

#### **Emergence of new idea**

There is emergence of new idea embodied in P (7), exemplified in the introduction to the group space, of the collocation "key information".

#### **Follow-up of idea**

Follow-up of idea is limited in Item 5b as speakers do not add nuance or further ideas to elaborate on the new idea of "key information" or to explore what it may entail.

**Item 6a.1** Transcript of interaction produced by Group a in response to Statement 6 - *a summary should follow the same order of presenting the information and ideas, as in the original text*

01	8:44	Y:	Ok the next one
02	8:48		(11.0)
03	8:59	J:	Eh as as Sing said before we can maybe we can, we don't
04			need to follow the order of the original text - eh if we want
05			to, ehm if we think w-which part is more important in our
06			own essay, we can use it eh first or eh maybe we can do other
07			(.) order.
08	9:31	Y:	Hmm
09	9:32		(4.0)
10	9:36	L:	Eh, I think maybe we need try to eh keep the (.) original eh
11			the same order ehm, however, if there are some special
12			situation, and eh we can change it.
13	9:54		(2.0)
14	9:56	Y:	Ehm:
15	9:58		(4.0)
16	10:02	J:	Ehm: [sorry, can you-
17	10:04	X:	[Eh, I think I think... Sorry- Lin- you- eh- who? ((laughs))
18	10:10	J:	((laughs)) You you can go first
19	10:15	X:	Oh ok. I I think it will eh to write a summary if use the same
20			order it's better to eh it's better to eh it's better for the eh
21			reader eh to under- eh to eh sorry eh if use the same order
22			maybe it's better for the reader to read it (.) so eh sometimes
23			we can use the same order but if eh eh we have some other
24			orders then we can use it also.
25	10:56		(6.0)
26	11:02	Y:	So for this one it can be true or false?
27	11:09	J:	So: hhh [maybe-
28	11:12	X:	[ I think it's false=
29	11:17	J:	=What?
30	11:18		(1.0)
31	11:19	X:	I think it's false
32	11:23		(3.0)
33	11:26	Y:	The next one (1.0) We should never comment on the original
34			text.

### 6a.2 Talk-through

J (3-7) uses the simple past form of the reporting structure (3) ('as S said before...') to explicitly pick up on S's turn from a previous section of the task (Item 9, lines 4-8), when they voiced their view about Statement 6. In effect, J (3) paraphrases S's statement about order, emphasising that if you consider a point to be more important, you can prioritise it by using a different order of points from that of the original text. J's use of the first conditional structure with "if" (4) and the use

of the collective subject pronoun “we”, paired with the deontic modals “need” and “can” (3-6) presents the group with the concept that they have a choice to make. The deontic modal “can” (3, 5, 6), and “don’t need” (3), implies that when writing a summary, the group may choose to deviate from the order that points are presented in in the original article, and the conjunction ‘or’ (6) accentuates that when writing a summary paragraph, there is a polar choice between maintaining the original order, or deviating from it.

L (10-11) picks up on J’s turn (3-7), reiterating the deontic modal structures that they has used, as well as the collective subject pronoun “we” (11). Again, the task of writing a summary is presented as something over which the group has agency to take decisions. L uses the contrastive discourse marker “however” (11), to introduce a new notion; that of a possible emergence of the need to summarise something in a different way from the standard procedure.

X (19-24) introduces a new perspective in the group’s discussion of the statement by placing the focus on the effect that the order might have on a reader (21, 22). They state (23-24) that both strategies proposed by J and L are valid; i.e. following the original order of the paragraph, or diverting from the original order. Like in J and L’s turns, “we can” is used by X (23-24) to convey the idea of flexibility of options for the group, and possibility is also inferred by the repeated use of the conditional tense, with “if”: (19), (21), (23).

### 6a.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a

#### 6a.3.1 Explicit reasoning, relationality, and cognitive openness

*Research question 1a: To what degree and how do interactants convey explicit reasoning?*

**EXP-** J (5-7) proposes a tangible reason for deviating from the original order of Items in a summary paragraph, presenting this with a conditional grammar structure with “if”- in the case (if) the summary writer considers a point to be

important for their own essay, they can change the order. The emphatic modifying phrase “our own essay” (6) increases the clarity of J’s message.

**EXP-** L (10-11) presents a hypothesis to the group. Their use of the contrastive discourse marker “however” (11), makes it clear that alternatives to the standard do exist.

***Research question 1b:** To what degree and how do interactants relate to points made by other speakers?*

**REL** - J (3) picks up on S’s turn from an earlier part of the task, where they suggested that there was a choice between following the structure of the original article or placing a section such as the conclusion at the start of the summary.

**REL** - L (10-12) picks up on J (3-7) by reiterating their point about the group being able to make a choice between using the same order or changing it. L replicates some of the same language structures as J; “we can”, “we need”, and “if”.

**REL** - X (19-24) picks up on the view proposed by J and L, endorsing their view that both options (retaining or varying the order of the points in a summary paragraph) are valid. As in J and L’s turns, X uses the zero conditional structure with “if”: (19-22), as well as the deontic modal, “can” (23, 24). Relationality is strengthened by a recursive use of the lexis from the shared object of the statement: “same order”.

***Research question 1c:** To what degree and how do interactants manifest cognitive openness in their talk?*

**OP** - L (10-11) adds a further nuance to the range of the discussion by suggesting that there may be special situations which require an order which deviates from the standard. Thus L expresses recognition that other scenarios exist whereby the points in the summary paragraph could be presented in a different order from that of the original text.

**OP - X (19-21)** amplifies the scope of the discussion by introducing the idea of the perspective of the reader, by claiming that the order in which points are made in a summary paragraph may have an effect on the reader's understanding.

**OP - X (22-23)** uses the conditional tense to transmit that there are different ways of ordering the points in the summary.

**Research question 1d:** *How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

Item 6a combines numerous instances of the three dimensions of transactivity. L (11), combines *explicit reasoning* with *cognitive openness* when they make it clear that there are alternatives to the standard order of points in a summary paragraph. The instances of *relationality* listed above (3-7, 10-12, 19-24) all imply *cognitive openness* as they use modal verbs to refer to the possibilities that exist when deciding how to arrange the order of points in a paragraph.

### 6a.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-12 Evidence of CKC and prolongation item 6a**

Item 6a Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker's own view	no
Challenge of another speaker's view	no
Prolongation of interaction	yes
Emergence of new idea	yes (3 instances)
Follow-up of idea	no

#### **Change of a speaker's own view**

There is no evidence of change of a speaker's own view.

#### **Challenge of another speaker's view**

There is no evidence of challenge of another speaker's view.

### **Prolongation of the discussion**

The discussion is prolonged when L (10-11) takes up J's point about changing the order in special situations.

### **Emergence of new idea**

There are three moments of new idea emergence; J's (5-6) point that ordering may be related to the need to emphasise points according to importance, L's (10-12) concept of special situations which require a non-standard approach, and X's (19-24) novel idea that the order in which points are made in a summary paragraph may have a significant effect on the reader of the text.

### **Follow-up of idea**

The introduction of new ideas by several speakers in Item 6a comprises a dynamic piece of interaction in which speakers explain the reasoning behind their views. The potential has been created for the development of three new points in the discussion. Despite this, none of the three ideas are taken up and developed by other speakers. The 6 second silence may have been followed by development of X's point about the effect the order could have on the reader. Instead, Y (26) takes the TRP up and brings the group focus back to the polar question of whether the statement is true or false. J (27) has one more attempt at development when they use the discourse marker "so" followed by the hedge with "maybe" but J's turn is overlapped and effectively cut off by X (28). There are no further attempts at development of the discussion.

**Item 6b.1** Transcript of interaction produced by Group b in response to **Statement 6** - *a summary should follow the same order of presenting the information and ideas, as in the original text*

01	13:00	D:	And the next one::: The information and ideas in the o-
02			original should be given in the s-same ↑order (2.0) ↑uh huh,
03			the same order!=
04	13:12	P:	=That's not necessary
05	13:14	D:	=Yeah, it's ↑not necessary, we can change (.) the order
06	13:19	P:	Yeah ↓yeah
07	13:22	D:	We ca- [we can
08	13:23	P:	[But then change its answer
09	13:28	D:	So it (1.0) it's ↓false [I think
10	13:32	X:	[False (1.0) I think so, it's ↓false
11	13:37		(1.0)
12	13:38	D:	Yeah=
13	13:39	X:	=You can put the conclusion first
14	13:44		(1.0)
15	13:45	D:	And the next one, you should never comment (1.5) on (.) Ah!,
16			co-ment on the-

### 6b.2 Talk-through

P (4) voices their opinion that the statement is false. D (5) picks up on P, with the backchannelling tag “yeah” showing agreement with P’s view. By repeating P’s clause: “it’s not necessary”, D (5) heightens the effect of consensus, and D’s turn is responded to with P’s (6) double affirmative backchannelling tag. D’s use of the collective pronoun “we” (05) paired with the deontic “can” emphasises that this is issue involves the whole group.

D (7) starts and re-starts a new utterance but is cut off by P (8), who wants D to make a change to the answer. D (9) does not respond to P, but declares their conclusion as false, by using the discourse marker of consequence, “so”. Assurance is conveyed by the downward shift on the adjective “false”, but the addition of the adjunct: “I think” (9), brings a level of openness to the discourse.

X comes in (10) in support of the opinion presented by P and D. By repeating the words “it’s false”, X increases confidence in their answer and the downward shift at the end of their turn adds to this. The use of “I think” by X adds a degree of openness. In tandem with D (9), (X) uses the subjective “I think”, juxtaposed with the definitive statement “it’s false”, spoken with downward intonation.

D agrees (12) with X using the affirmative, “yeah”. X (13) comes in again to contribute a specific point about how to approach the task of ordering Items in a summary. Yet this point is unsubstantiated, with no explanation of the rationale for this view. There is no further discussion about the task statement.

### **6b.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a**

#### **6b.3.1 Explicit reasoning, relationality, and cognitive openness**

***Research question 1a:** To what degree and how do interactants convey explicit reasoning?*

**EXP** - explicit reasoning is not evidenced in this Item.

***Research question 1b:** To what degree and how do interactants relate to points made by other speakers?*

**REL** - D (5) picks up on P (4), supporting their view by adding the rationale that they can change the order.

**REL** - P (8) voices an imperative to D (5), asserting that D should change the answer on the group’s worksheet.

**REL** - X (13) operates on P and D’s view by adding a specific point that the conclusion of the paragraph can go at the start.

***Research question 1c:** To what degree and how do interactants manifest cognitive openness in their talk?*

**OP** - X (13) presents their view as a possible option with the use of the modal “can”.

***Research question 1d:** How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

*Relationality* is combined with *explicit reasoning* in (13) as X follows up on D and P, presenting an example to illustrate the point that a summary paragraph can be arranged in different ways. X's turn also embodies cognitive openness through the use of "can", their proposal is conveyed as a possibility.

### 6b.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-13 Evidence of CKC and prolongation item 6b**

Item 6b. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker's own view	no
Challenge of another speaker's view	no
Prolongation of interaction	no
Emergence of new idea	yes (1 instance)
Follow-up of idea	no

#### **Change of a speaker's own view**

There is no evidence of change of a speaker's own view.

#### **Challenge of another speaker's view**

There is no evidence of challenge of another speaker's view.

#### **Prolongation of the discussion**

Bald expressions of mutual agreement by D (5), P (6) and X (10), do not trigger extension of the discussion, and although they take up the TCU again (13) and qualifies their point with a specific statement about putting the conclusion at the beginning of a summary paragraph, this is neither explained by X, nor challenged by others. Therefore, prolongation is not realised in this Item.

#### **Emergence of new idea**

X (13) proposes that summary writers could put the conclusion of their summary in the first position. This specific strategy is not mentioned in the statement and effectively embodies a new idea.

### Follow-up of idea

There is no follow-up of X's (13) idea.

### Item 7a.1 Transcript of interaction produced by Group a in response to Statement 7 - *in a summary, you should never express your opinion of the original text*

01	11:18	Y:	The next one; you should never comment on the original text.
02	11:27	A:	(.hhh) No, I think we need to comment the the original (.)
03			main point, just with your comment so I think it's very good
04	11:37	J:	Yes, in my opinion the main job of our essay is to comment eh
05			the original text, so that we can eh provide our own (.) point
06			and stance in our: ↓essay
07	11:50		(1.0)
08	11:51	A:	Yeah, it's right.
09	11:54		(3.0)
10	11:57	Y:	Eh I thought ehm I I thought it's a summary oh when I saw this
11			one I I thought 'it's right', and eh I should not comment on
12			the text (1.0) after eh hearing what you said, I think maybe
13			we can...
14	12:16		(6.0)
15	12:22	Y:	Ok, the next one
16	12:24		(9.0)
17	12:33	J:	(.hhh) (hhh)
18	12:34		(10.0)
19	12:44	J:	Eh well about the former question I think Yimi's point it also
20			eh can also be considered eh cause maybe we can write our
21			comment we can and eh we can't in the original summary we
22			don't need to summary it, (.) we don't need to mak-
23			comment in the eh in ↓the summary
24	13:01	Y:	[Hmmm
25	13:02	L:	[Yeah I agree with you, ((laughs)) (1.0) eh, sorry
26	13:10	J:	I'm not very sure about it.
27	13:14	X:	Eh I think eh we shouldn't use the comment on the original
28			text. In the summary eh (.) we just to express eh author's
29			opinion of ↓this essay (.) so I don't think we should to (.) eh
30			comment on the original text
31	13:30	A:	Hmm, yeah I I think so,
32	13:34	L:	Ehm, but maybe we can write our own opinion eh before or
33			after the summary
34	13:44	Y:	Hmm↑
35	13:45	J:	So maybe the answer is true↑

36	13:50	X:	I (.) think it's false↓
37	13:56	Y:	Eh false (1.0). You should never comment on... It's true right?
38			Eh agree to what we with what we are saying? eh Xiao em do
39			you think we [can...?
40	14:13	X:	[I think (.) yes I think this eh this idea is in the summary, not
41			eh eh this idea is expressed when we write a summary we
42			can't use- we can't comment on the original text, neither eh
43			before or after
44	14:38		(2.0)
45	14:40	Y:	Yeah
46	14:42	X:	So I think it's ((unintelligible))
47	14:48	Y:	Ehm (2.0) eh how about others?
48	14:57		(2.0)
49	14:59	Y:	Eh I think this one [should
50	15:03	S:	[I think it's true=
51	15:06	Y:	=True true
52	15:08	S:	Yeah
53	15:10	Y:	Yeah I I think I think Xiao's agreement is the same with this
54			ehm this sentence, ↑ Xiao
55	15:26	X:	↑Yeah

### 7a.2 Talk-through

A (2-3) provides an explanation of why Statement 7 is false, stating that when writing a summary paragraph, you should use your own comments to talk about the original text; i.e. the inverse of the task statement. This view is affirmed by J (4), who then develops the rationale (4-6), by linking the statement to the purpose of an essay. The emphatic phrase “the main job” (4) is impactful in highlighting the notion of prioritising motives.

Y (10-13) seems to be sharing their train of thought, which hinges on how they transitioned from one position to another. The overt anaphoric phraseology: “after hearing what you said...” makes undoubtable connection between J's (and A's) expressed rationale and their own belief; they has been convinced by them.

J (19-20) using explicit anaphoric language to frame their turn with a proposal that Y's view (10-11) should be considered.

Ignoring Y's request to move on to the next Item in the Task, J (20-23) steers the discussion back to the main focus of Statement 7.

J uses the subordinate conjunction, “cause” (20), to frame their suggestion that one should not include their own stance in the actual summary, but that they

could write it somewhere else (the student essay itself). The notion of writing your opinion in another place, constitutes a new idea, which is taken up later by L (32-33).

J (26) shares their uncertainty about the issue of using your own voice when writing a summary paragraph.

X (27-30) adds a nuanced point to the discussion of the statement, saying that a summary should include the stance conveyed by the author of the original article.

Y (38-39) asks X to opine about the statement.

X (40-43) reiterates their view that the statement is true; they are responding in particular to L's statement (31-32) about placing one's opinion before or after the summary. X is saying it is not correct to express one's own opinion, irrespective of whether it comes before or after, thus they contradict L's (32-33) point about adding one's own opinion separately from main summary paragraph. This seems to convince Y (45), who ratifies X's long explanation, with the affirmative "yeah".

Y (53-54) draws a conclusion that X (40-43) is effectively saying the same thing as the task statement.

### **7a.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a**

#### **7a.3.1 Explicit reasoning, relationality, and cognitive openness**

*Research question 1a: To what degree and how do interactants convey explicit reasoning?*

**EXP - A (2-3)** offers some explanation of their view that the statement is false

**EXP - J (4-6)** contributes a rationale which links the statement to the student's course task of writing an essay, asserting the idea that an essay requires the inclusion of commentary about original sources.

**EXP - X (27-30)** uses the emphatic “just” and the cause and effect structure with “so”, to explain a view which distinguishes the representation of the stance of the original author, from the stance of the student who is writing the essay.

**EXP - X (40-43)** recurs to their point that the student should not express their view in the summary or elsewhere, using the emphatic negation expressed by the correlated coordinator: “neither...nor”.

**EXP - Y (53-54)** produces a summarising conclusion that what X has expressed is effectively the same idea as the one communicated in the task statement. This is a way to fortify that the group are in total agreement about their answer to the statement.

*Research question 1b: To what degree and how do interactants relate to points made by other speakers?*

**REL - J (4)** picks up and affirms A’s view (2-3)

**REL - Y (12)** uses anaphoric reference (“what you said”) to show how J’s (4-6) turn convinced them to change their answer.

**REL - J (19-20)** refers to Y’s declaration that they had held the contrary view to A (2-3) and J (4-6).

**REL - L (32-33)** picks up on J’s point (21-23), and poses a challenge by insisting that an opinion can be included before or after the main summary.

**REL -** By asking X to opine about the statement, Y(38-39) creates the opportunity for X to take up the the TRPand elaborate further on their view

**REL - X (42-43)** picks up on and contradicts L’s (32-33) point about adding one’s own opinion separately from the main summary paragraph

*Research question 1c: To what degree and how do interactants manifest cognitive openness in their talk?*

OP - J (19-20), demonstrates cognitive openness by relating to and openly contemplating Y's (10-13) view.

**Research question 1d:** *How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

Y 10-13) combines *explicit reasoning* with *relationality* to explain their rationale for changing their opinion about the statement. J (19-20) combines *explicit reasoning* with *cognitive openness* through the use of hedging structures to convey openness to the issue of whether a summary writer should include stance in a summary paragraph. *Explicit reasoning, relationality* and *cognitive openness* are combined by L (32-33) when they make a hedged suggestion about where an opinion could be placed in the summary paragraph.

### 7a.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-14 Evidence of CKC and prolongation item 7a**

Item 7a. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker's own view	yes
Challenge of another speaker's view	yes
Prolongation of interaction	yes
Emergence of new idea	yes (4 instances)
Follow-up of idea	yes (2 instances)

#### **Change of a speaker's own view**

There is clear evidence of change of one's own view in this Item. It is manifested explicitly by Y (10-13) when they state that they has changed their view due to the contributions of other speakers in the discussion, namely J (4-6).

#### **Challenge of another speaker's view**

There is challenge of another speaker's view when X (42-43) picks up on L's (32-33) point about before or after, and robustly dismisses it.

### **Prolongation of the discussion**

J (19-23) returns to Y's (10-13) view that a summary need not include the writer's opinion. J expands their turn, aided by the inclusion of hedging structures to share their contemplation with the others.

### **Emergence of new idea**

J (4-5) contributes a new idea by stating the purpose of an essay and linking this to their second idea; the communication of stance.

J (20-23) contributes the idea that they may write comments somewhere else, instead of in the summary.

### **Follow-up of idea**

L (32-33) adds nuance to J's (4-6) point about stance in writing, saying that they could write their personal opinion before or after the summary. J attempts to develop the point made by Y by suggesting that stance should not be part of the summary paragraph.

**Item 7b.1 Transcript of interaction produced by Group b in response to Statement 7 - *in a summary, you should never express your opinion of the original text***

01	13:33	D:	And the next one, you should never comment (1.5) on (.) Ah!,
02			[co-ment on the-
03	13:40	X:	[Yes, it is true.
04	13:43	D:	Why is it true? I don't understand ↓what you mean
05	13:48	Z:	Summary about original text original you shouldn't express
06			your own opinion because eh original text is always author's
07			opinion=
08	14:00	X:	=Yeah, yeah. There is no judgement
09	14:05	P:	In the academic essay we shouldn't show our own opinion
10			directly.
11	14:12	D:	Yeah, (2.0) I don't have the opinion about this question
12			((laughs)), (1.0) but (.) I think you are right, (.) ↓so=
13	14:19	X:	=Eh, the next one
14	14:22	D:	So it's [true?, (.) the next one.
15	14:24	Z:	[Yeah, it's true, ↓hmm.

### 7b.2 Talk-through

D (4) poses a direct question to X following their declaration (3) that the statement is true. By adding (4) that they do not understand what X means, D presents a challenge. The challenge is put out into the group discussion space, and is answered by Z (5-7), rather than X. Z takes up the the TRP to respond to D with an SPP which explains that summary paragraphs should reflect the opinion of the author of the original article. X (8) joins in to corroborate Z's explanation, adding that a summary should not contain judgement.

P (9-10), ratifies the answer given by Z and X, using the collective pronoun "we", combined with the deontic modal to advocate what the collective should or should not do.

D (11) responds affirmatively to accept the turns of the others, adding that they are not sure of the answer. Despite being unsure, D's third TCU (12) uses the contrastive conjunction, "but" to express that they think the argument built by the others is correct. D's endorsement of the collective answer further strengthens the consensus.

D (14) invites the others to confirm that they believe the answer to be "true", producing another FPP with the direct question, to which Z (15) responds with a SPP which underlines the group's collective view.

### 7b.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a

#### 7b.3.1 Explicit reasoning, relationality, and cognitive openness

*Research question 1a: To what degree and how do interactants convey explicit reasoning?*

**EXP** - Z (5-7) responds to D (4), with a two-part explanation; that summary paragraphs should show the opinion inherent in the original article.

*Research question 1b: To what degree and how do interactants relate to points made by other speakers?*

**REL** - Z's turn (5-7) picks up on X's comment (3) and also responds to D's (4) expressed wish for explanation.

**REL** - X (8) joins in to corroborate Z's explanation, adding that the explicit claim that a summary should not contain judgement. By using the word "judgement", X may be paraphrasing the previous word "opinion" used by Z (6).

**REL** - P (9-10) picks up on the argument made by Z (5-7) and X (8), adding the notion of directness and calling on the group's shared knowledge from the course content, that subjective opinions should not be explicit in a student's writing.

**REL** - D (4) relates to the group with a direct question which seems to challenge X's view (3). Their use of the word "why" sets up the interaction for an explicative response from X, although in fact it is Z (5-7) who takes the opportunity to offer an explanation.

*Research question 1c: To what degree and how do interactants manifest cognitive openness in their talk?*

**OP** - There is no evidence of cognitive openness in this item.

*Research question 1d: How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

Three instances of *relationality* (5-7, 8, 9-10) in this Item also embody *explicit reasoning* as the speakers in each case provide justification for their view (5-7, 8, 9-10) or make reference to shared objects (9-10).

### 7b.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-15 Evidence of CKC and prolongation item 7b**

Item 7b. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker's own view	yes
Challenge of another speaker's view	yes
Prolongation of interaction	yes
Emergence of new idea	yes (3 instances)
Follow-up of idea	yes (3 instances)

#### **Change of a speaker's own view**

There is evidence that D experiences a change of their own view, from (4) where they displayed scepticism about the answer, to (12), where they overtly state that the others are right about the statement being true.

#### **Challenge of another speaker's view**

D's (4) TCU about not understanding X's meaning is a significant moment of challenge. The direct question "why" is juxtaposed by D with the declaration that they do not understand X's view that the statement is true.

#### **Prolongation of the discussion**

Z's (5-7) explanation leads to further turns by X (8) and P (9-10) which expand their argument.

In response to D's (4) challenge to X (3), other speakers operationalise the feedback relevance place one by one, with suggestions to support X. The interaction is prolonged.

### Emergence of new idea

There are three new ideas: Z (6-7) that the original text is always the author's opinion, X (8) that there should be no judgement in a summary, and P's (9-10) nuanced point that students' opinions should not be direct.

### Follow-up of idea

The ideas (8 and 9-10) cited above follow up on the new idea (6-7). The result is that the view that one should not include opinion in a summary paragraph is developed over the interaction.

### Item 8a.1 Transcript of interaction produced by Group a in response to Statement 8 - *it is better to write up the summary from notes made previously about the original text*

01	15:42	Y:	Ok, the next one (2.5) It's true I think; we should eh write the
02			summary according our notes eh our notes, so that we eh we
03			we can we can ehm be avoid ehm repeating the sentences as
04			the original text.
05	16:07	J:	Yes, I think it's the (.) a good method to avoid plagiarism in
06			our own essay
07	16:13	Y:	↓Hmm
08	16:14		(4.0)
09	16:18	Y:	So, it's true (1.0). So, the last one

### 8a.2 Talk-through

After post-framing their opinion with the hedging phrase, "I think" (1), Y (1-4) states their rationale of what they should do, explaining the justification of this method with the help of the subordinated clause introduced with "so": namely that they want to avoid repetition of sentences from the original text. The

frequent use of the collective pronoun “we” emphasises the collective nature of the task for the group.

J (5) responds to Y with a clear “yes”, and qualifies their view with an explicit statement of agreement. J (5-6), adds a new reason why they should use notes to write a summary. By introducing this new reason, J widens the scope of the discussion. Y’s interjection (7) with downward shift endorses J’s point. Y comes back in (9) with the conclusive: “So it’s true”, which represents the collective view.

### **8a.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a**

#### **8a.3.1 Explicit reasoning, relationality, and cognitive openness**

*Research question 1a: To what degree and how do interactants convey explicit reasoning?*

**EXP** - Y (1-4) offers a rationale to justify why it is good to write notes instead of writing the paragraph summary directly.

*Research question 1b: To what degree and how do interactants relate to points made by other speakers?*

**REL** - J (5-6) picks up on the rationale contributed by Y (1-4), paraphrasing their point about repeating text from the original.

*Research question 1c: To what degree and how do interactants manifest cognitive openness in their talk?*

**OP** - J (5-6) adds a new reason why they should use notes to write a summary, when they say that it can help avoid plagiarism.

*Research question 1d: How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

When picking up on Y’s (1-4) point, J (5-6) uses *explicit reasoning* by including a specific rationale (that it is a way to avoid plagiarism) for using notes before

writing one's summary paragraph. Thus J combines *explicit reasoning* with *relationality*.

### 8a.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-16 Evidence of CKC and prolongation item 8a**

Item 8a. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker's own view	no
Challenge of another speaker's view	no
Prolongation of interaction	yes
Emergence of new idea	yes (1 instance)
Follow-up of idea	yes (1 instance)

#### **Change of a speaker's own view**

There is no evidence of change of a speaker's own view.

#### **Challenge of another speaker's view**

There is no evidence of challenge of another speaker's view.

#### **Prolongation of the discussion**

J's (5-6) point embodies extension of Y's (1-4) declaration and serves to deepen the discussion.

#### **Emergence of new idea**

By equating the practice of repeating text from the original article with plagiarism (5-6), J effectively adds a new idea to the discussion.

#### **Follow-up of idea**

J (5-6) adds scope to the argument introduced by Y (1-4).

**Statement 8** - *it is better to write up the summary from notes made previously about the original text*

**Item 8b.1** Transcript of interaction produced by Group b in response to **Statement 8** - *it is better to write up the summary from notes made previously about the original text*

01	14:17	D:	So it's [true?, the next one.
02	14:20	Z:	[Yeah it's true, hmm
03	14:22		(6.0)
04	14:28	X:	Yes, it's true
05	14:30	P:	↓Yeah
06	14:31	Z:	[Yes I think it's true
07	14:31	D:	[Yeah, yeah it's true.
08	14:35	P:	Yeah=
09	14:36	D:	=Hmm (.) We're better not looking...we're better eh don't
10			look the text when: we write a summary=
11	14:45	P:	=This is the lesson B ((laughs))
12	14:50	D:	[Yeah ((laughs))
13		Z:	[Yeah ((laughs))
14	14:53	D:	Just our own opinions, our own views (2.5) You don't need to
15			gi- ((Reads Statement 9 quietly))

### 8b.2 Talk-through

Lines (1-8) consist of different speakers (D, Z, X, P) expressing their respective view that Statement 8 is true, without any explanation.

D (9) reasons that it is important not to look at the original text when writing a summary. By doing this D infers that note-taking provides an alternative to writing your paragraph directly from the original text. P (11) endorses D's statement, by linking it to a lesson from the course material.

### 8b.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a

#### 8b.3.1 Explicit reasoning, relationality, and cognitive openness

**Research question 1a:** *To what degree and how do interactants convey explicit reasoning?*

EXP - D (9-10) offers a motive to justify using notes, inferring that if students use notes, it allows them to avoid looking at the original text.

**Research question 1b:** *To what degree and how do interactants relate to points made by other speakers?*

REL - P (11) picks up and corroborates D's aphorism (9-10) about not looking at the original text, by referring to a lesson from the course materials. The use of the demonstrative pronoun "this", connects up to D's point but also facilitates the link to a third object, the lesson B course material.

**Research question 1c:** *To what degree and how do interactants manifest cognitive openness in their talk?*

OP - there is no evidence of cognitive openness in this Item.

**Research question 1d:** *How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

P (11) combines *relationality* with *explicit reasoning*, when they refer to the shared object (lesson B course material) when operating on D's (9-10) point.

### 8b.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-17 Evidence of CKC and prolongation item 8b**

Item 8b. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker's own view	no
Challenge of another speaker's view	no
Prolongation of interaction	yes
Emergence of new idea	yes (2 instances)
Follow-up of idea	yes (1 instance)

### Change of a speaker's own view

There is no evidence of change of a speaker's own view.

### Challenge of another speaker's view

There is no evidence of challenge of another speaker's view.

### Prolongation of the discussion

There is limited prolongation which is invoked by P's (11) contribution.

### Emergence of new idea

By contributing the nuanced point that by writing notes, one can avoid looking at the original text, D (9-10) motivates P (11) to take up the TRP and add a new idea by relating D's rationale to the course material.

### Follow-up of idea

P (11) builds on D's point by using the reference to a shared source to support their convergent view.

**Item 9a.1 Transcript of interaction produced by Group a in response to Statement 9 - *you don't need to give the source of the information as long as you agree with the text***

01	16:20	Y:	So, the last one...
02	16:24		(26.0)
03	16:50	J:	.hhh
04	16:52	Y:	I'm not su-:, I'm not very sure about ↓this one ((laughs))
05	16:59		(2.0)
06	17:01	J:	Eh, eh is it means that we don't need to use com-p- eh
07			↑citation marks in our, if we agree with the option- eh eh
08			opinions?=-
09	17:14	Y:	=↓Yeah (1.0), the [citation
10	17:18	J:	[Ehm, if if it means that I think we do
11			need to use citation marks only eh even if we, (.) eh even
12			if the opinion is the same is the same as ↓our own.

13	17:33	Y:	Yeah:: I also think so maybe it seems because it's a
14			summary so it there's no need to eh write the ↑citation,
15			(1.0) do you think so? Eh hhh (3.0) Do you have any (.)
16			different ideas about this one?
17	17:48		(11.0)
18	17:59	Y:	No?
19	18:00		(5.0)
20	18:05	Y:	Maybe it's ↓true
21	18:09		(7.0)
22	18:16	J:	((reading the statement aloud quietly)) Eh::: actually I
23			think it's false but I'm not ↓very sure ((laughs)).
24	18:25		(2.0)
25	18:27	Y:	↓Oh, you think you eh we we we should we should give the
26			source of the information?
27	18:35	J:	Eh, if it means the citation mark, (.) eh yes, I think it's
28			false
29	18:42	Y:	↑Oh:::
30	18:43	A:	Eh, I think it's maybe true because eh I think this task we
31			need to just before the summary, I think summary we don't
32			need some eh citA city-ation some source or just ehm make
33			eh make some provement because this work we need do
34			just before this part.
35	18:58		(2.0)
36	19:00	X:	I als- I also think it's true cause the summary is from the
37			article so if we add it so the source of the information is
38			from the article then we don't need to give some eh some
39			↓other information
40	19:20		(15.0)
41	19:35	Y:	This one (2.0) this one will also give ↓different ideas
42	19:43		(6.0)
43	19:49	S:	Hello. ((laughs))
44	19:51	Y:	Hello.
45	19:53	S:	Ehm, I'm confused about this sentence because eh if it is
46			eh if it means the explanation from the article, maybe it's
47			false, but if it's about the other information or more
48			information about this opinion, maybe ↓it's true. So
49			((laughs)) I'm not sure the sentence ↑meaning.
50	20:13		(11.0)
51	20:24	Y:	Maybe the sentence meaning eh (.) eh means the (.) the
52			source from the ↓original text.
53	20:33		(5.0)
54	20:38	S:	So that means the citation- the citation mark?
55	20:46		(2.0)
56	20:48	Y:	I think so ((laughs))
57	20:53	S:	Eh oh ok, ehm (1.0) If the meaning is what you said,
58			↑maybe it's false ((laughs)) (1.0) Yeah, it's ↓my opinion
59			hhh.
60	21:03		(6.0)
61	21:09	X:	If it's a summary why we should use other source of
62			information?
63	21:16		(3.0)
64	21:19	S:	[Eh-
.	.	.	.

65		X:	[Actually I-
66	21:22		(4.0)
67	21:26	S:	Ok, eh what I mean is that eh maybe we should eh search
68			for information to eh support the opinion or something (.)
69			like that (.) so it's fal- so it's ↑true, but maybe it's about
70			the the citation marks, so (.) it's ↑false
71	21:41	J:	Eh::, yes according to Xiao's opinion I think it it might be
72			true but if it means that we don't need to add the original
73			text citation mark, eh I think ↓it's false, so ehm (1.0) so (.)
74			eh I don't I'm not very sure about the meaning of it.
75	22:00	Y:	Hmm
76	22:01		(1.0)
77	22:02	L:	Yeah I think it's it's not our opinion it's from other others,
78			so (.) maybe we need to write what it can, eh what it
79			((unintelligible))
80	22:14		(13.0)
81	22:27	A:	Eh I think maybe it's (.) eh false, because if you just skim
82			the article and you don't have the understanding of this
83			articles eh so you just make a summary just including some
84			of the key words but eh your summary is not related to the
85			original text so I think this maybe, ehm, is not ↓not good
86			(1.0)
87	22:47	Y:	[Hmm::
88	22:50	X:	[Why the summary is not related to the original text?
89	23:00	A:	↓Ehm:: (tuts x 2) I think it's it's very necessary to dictate
90			((laughs))
91	23:09		(2.0)
92	23:11	S:	[if you sum-
93		J:	[Eh yes we- eh- oh ok
.	.	.	.
94	23:16		(4.0)
95	23:20	J:	Eh, well I think we now have some argument about the real
96			meaning of this s sentence eh and eh both of eh opinion is
97			right about our meaning in this in the in the specific s eh
98			environment so ehm maybe we can check the real meaning
99			of it, and ask about ask to ↑Jane.
100	23:46		(2.0)
101	23:48	Y:	Yes (2.0) ((distortion)) we almost eh finished and eh the
102			second and the last sentence eh we may ask ↑to Jane

### 9a.2 Talk-through

J (6-8) sets up a discussion of how to interpret the statement itself, rather than on whether it is true or false. J picks this theme up again (10-12), openly postulating between different possibilities which they convey with the use of the conditional tense.

Y (9) concurs with J (6-8), and by reiterating J's use of the word "citation", connects to J's point.

Y's direct request (15-16), for other group members to contribute their ideas, is met with silences, and despite their prompting, only J (22-23) comes back in to share their view. Y (25-26) asks J to clarify their position, which they do (27-28), again using the conditional structure with "if" to convey that their view is dependent on the interpretation of Statement 9.

Then A comes in (30-34) to explain their belief, which is the contrary to that expressed by J. A's statement conveys that due to the sequencing of the summary writers task, it is not necessary to use sources in the summary paragraph. A's phrase "make some provement..." introduces a potential new point, about supplying evidence in the summary.

X (36-39) supports A, using the adverb, "also", to show agreement with A. X explains the rationale of their view, using "if" and "then" to specify the condition to be met, for one not to supply a source. X (36-39) believes that since sources are already included in the original article, it is not necessary to list them in the summary.

S (45-49) brings the focus of the discussion back to the meaning of the question text itself, reiterating J's (10-12, 27-28) use of the first conditional to openly contemplate the two possible interpretations of meaning of the statement, as this is what will determine one's view of whether the statement is true or false.

Y (51-52) contributes a suggestion of the meaning of the statement.

S (54) operates on Y's postulation (51-52), by firing back a request for clarification from Y, then after Y's compliance (56), S reverts back to the "if" clause to outline that their view depends on the group's accepted meaning of the statement, as debated by J and Y. S's use of the reporting structure (57); "what you said" overtly operates on Y's (56) confirmed belief that the statement refers to the practice of citing sources in the original text.

X (61-62) challenges the points made by Y, J and S by posing an open direct question, subordinated to the conditional clause.

S (67-70) takes up the the TRP to provide an SSP to X (60). S's use of the cleft structure: "what I mean is that", foregrounds their elaborate explanation which consists of balancing the two ways of interpreting the statement. The use of hedging phrases; "maybe" and "something like that", as well as the upward shift at the end of S's turn, presents their view as a tentative one.

J (71-72) provides immediate validation of S's (67-70) point by using the affirmative to begin their turn. J restates the dichotomy at the centre of the group's lack of consensus about the statement, stressing that the answer is contingent on how the text of the statement is interpreted. The conditional structure is used by J (72) to state the possible meanings of the statement, and he explains that the action to take is dependent on that meaning.

L (77-79), highlights that in the summary, they should report another's opinion, i.e. that of the author of the original text.

A (81-85) comes in after a 13-second silence. A does not take up L's (76-78) point, but provides an explanation of why it is not a good approach to base a summary on skim-reading and the use of key words, because the result would be a summary text which does not reflect the original article.

In parallel to their earlier turn (61-62), X (88) challenges A with a direct open question, which will require an answer.

A (89) responds to X (87) with a SPP, which aims to justify A's (80-84) previous point by emphasising that dictation is necessary. By "dictate", A (89) may mean replicating the key points from the original, though this is not totally clear.

J comes in (95-99) to present a synopsis of what the group have discussed and they explains that the two different views may be right in different contexts.

Y (101) responds to J with a SPP which ratifies J's overview of the discussion.

### 9a.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a

#### 9a.3.1 Explicit reasoning, relationality, and cognitive openness

*Research question 1a: To what degree and how do interactants convey explicit reasoning?*

**EXP** - A (30-34) offers an explicit rationale to support their view, by saying that due to the sequencing of the summary writer's task, it is not necessary to use sources in the summary paragraph.

**EXP** - S's (66) use of the cleft structure: "what I mean is that", foregrounds their laboured explanation (68-69), which consists of positing the two ways of interpreting the statement that the group have already suggested, alongside each other.

*Research question 1b: To what degree and how do interactants relate to points made by other speakers?*

**REL** - Y (9) concurs with J (6-8), and by reiterating J's use of the word "citation", they connect more overtly to their point.

**REL** - A (30-34) to explain their belief that the statement is true, which is contrary to the view expressed by J (22), that the statement is false.

**REL** - X (36-39) supports A's view (30-34) adding strength to the conflict with J's view.

**REL** - S's (57) use of the reporting structure (57); "what you said" overtly operates on Y's (56) confirmed belief that the statement refers to the practice of citing sources in the original text.

**REL** - X (61) challenges the point made by S (46) by posing an open direct question, subordinated to the conditional clause.

**REL** - S (66-69) takes up the TRP to provide an SPP to X (60).

REL - A (89) offers a response to X (87).

*Research question 1c: To what degree and how do interactants manifest cognitive openness in their talk?*

**OP** - Openness to possibilities around the meaning of the statement is suggested by J's upward shift (7) and highlighted by the repeated use of the "if" clause, which is taken up again by J (25), to help him postulate between the different possibilities.

**OP** - A's (30-34) introduces two new ideas; one (31, 34) is that the sequencing of steps needed to produce a summary of an academic article affects whether one should use sources or not. The other new idea is in A's (33) phrase "make some provement...", which seems to highlight the need to improve the quality of the summary.

**OP** - Y (51) extends the possible meaning of the statement, using hedging ("maybe") to suggest that it might refer to the original text as the source.

**OP** - X's (60-61, 87) open questions with "why" challenge the views expressed by the group (14, 27, 47-48, 54) about citing and using sources. With the function of FPP, X's question sets the group up for continuation of discussion, since the expectation is that other speakers may answer X's question, to which S (66-69), then A (89) comply.

**OP** - S (68-69) returns to the debate about the meaning of Statement 9, which has dominated this Item, thus they keeps the theme of interpreting the meaning of the statement open. The use of hedging phrases; "maybe", "we should" and "something like that", as well as the upward shift at the end of S's turn, presents their view as a tentative one.

**OP** - The fluctuating opinion of J, from (22), where they say that the statement is false, to (70-72), where it could be true or false, demonstrates an open attitude towards the view encompassed in the statement.

**OP** - A seems to demonstrate tolerance of both views, changing their opinion from “true” in (30), to “false” in (80).

**Research question 1d:** *How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

Although there are many instances of the three dimensions of transactivity in the item, there is little evidence of combination of these. S (66) combines *explicit reasoning* with *relationality* when they pick up on X’s (60-61) challenge by suggesting they should take the concrete action of searching for information.

#### 9a.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-18 Evidence of CKC and prolongation item 9a**

Item 9a. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker’s own view	yes
Challenge of another speaker’s view	yes
Prolongation of interaction	yes
Emergence of new idea	yes (9 instances)
Follow-up of idea	Yes (3 instances)

#### **Change of a speaker’s own view**

There is evidence of change of opinion in J (22-23), when they think the statement is false, to (71-72), where it could be true or false depending on the condition.

A manifests a turnaround of opinion, in (30) they think it is true, but as the discussion advances, they pivot to the view that the statement is false (80).

#### **Challenge of another speaker’s view**

X (60-61, 88) presents a challenge to S (46) to explain why they should use other sources of information. This leads to prolongation of the discussion through the responses to X which are provided by S (67-70) and A (89).

### **Prolongation of the discussion**

The interaction is prolonged by a recurring debate about the essential meaning of Statement 9: J (6-8, 10-12, 27-28, 71-74); S (45-48, 57-58, 67-70).

### **Emergence of new idea**

J (6-8, 10-12), introduces the notion that there are different possible interpretations of the meaning of the statement.

Y (14) contributes the idea that a citation is not necessary in a summary.

A's statement "make some provement" (33) suggests that the quality of the summary writing is an issue.

A (31, 34) introduces the notion of how the sequencing of steps to be followed when completing the summary may justify not using sources.

X (36-39) introduces the idea that sources referenced in the article do not need to be cited.

Y (51-52) contributes a suggestion of what they might understand from the text the statement, that it could be the source used in the original text.

J (71-72) suggests that it depends on whether they use quotation marks, thus he introduces the notion of distinction between citing and quoting from sources.

L (77-78) contributes the notion of secondary commentary; that it is not their direct opinion which counts but that they must relay another writer's opinion.

A (81-85) introduces the notion of skim reading the article.

### **Follow-up of idea**

Although there is abundant relationality in the Item, there are few instances of development of others' ideas.

Y (14) builds on J (10-11)'s introduction of the notion that the need to use citations depends on certain criteria such as whether one's opinion aligns with the original article. Y (14) adds the notion that because it is a summary paragraph (as opposed to another genre), it is not necessary to provide citations.

A (67-70) provides follow-up of previous points about when to use citations, by introducing a tangible action of searching for information.

**Item 9b.1 Transcript of interaction produced by Group b in response to Statement 9 - *you don't need to give the source of the information as long as you agree with the text***

01	14:44	D:	Just our own opinions, (.) our own views, (2.0) you don't
02			need to g- (whispers) (7.0) ↓Hmm: (2.0) the last one is, it's
03			↑a difficult I think, ehm (1.0), If I agree a agree with a an
04			opinion, I will give my source of of information, (.) it can
05			prove why, why I'm agree, yeah↓. But s- in in a summary I
06			don't (.) I don't think an opinion should do, a summary is not
07			(.) cannot be too long::, maybe short and ↑simple (.) hmm, I
08			think. [What about others?
09	15:33	Z:	[I think it's true
10	15:36	D:	↓Oh::
11	15:38	Z:	Yeah, (2.0) cause the summary is about the ↓original article,
12			yes, we shouldn't give our (.) eh opinions and some sources
13			to:: supported our: (.)↓view
14	15:53		(10.0)
15	16:03	X:	↓Yeah=
16	16:05	D:	=So wha-?
17	16:07	X:	It's ↓true::
18	16:09	D:	It's true? (2.0) Pan, what [do you think?
19	16:12	X:	[you don't need to give
20	16:15	P:	Oh ↑what, what means about the source of information? That
21			means eh eh maybe (.) at a reference of...
22	16:23	Z:	Hmmm:: [eh::, examples (.) or quotations
23	16:25	D:	[Yeah the, yeah the reference of some for example,
.	.	.	.
.	.	.	.
24			some other articles, some news you see in the in the
25			everywhere to prove your opinion, I think for example the
26			source of the information (.) ↓yeah. (4.0) I don't know maybe

27			it's true↑, I don't, I'm not sure. I don't need to give the
28			source of the information ((reads Statement in low voice))
29	16:53	Z:	I think it's ↓true.
30	16:58	D:	What about Lee?
31	17:01	L:	Hmm:, I didn't quite eh understand this sentence, because I
32			think eh if I agree with the opinions eh expressed, (.) not in
33			summary
34	17:16	D:	Yeah, yeah, I-, erm, just, (.) for me eh I don't know, a
35			summary should should have the source of the information=
36	17:26	L:	=But but we just we just said that in summary, we -don't-
37			express -↓our opinions. (3.5) ↓So (.) I (.), so I'm a ↑little
38			confused too.
39	17:41	D:	↑Hmm hmm:
40	17:43	L:	Yes
41	17:44	Z:	It's about summary, ↓yeah. Yeah, [to follow (with) the details
42			about some reason...
43	17:50	D:	[For some reason Hmm, hhh, so it's a dif- a little difficult↑
44			((laughs)) And we have two question, we are not ehm and we
45			are not sure.
46			<b>Later, they return to the question again</b>
47	20:02	D:	hhh And last one (1.0). I'm not sure=
48	20:07	Z:	=We're not sure what's the meaning, of the source, (.) the
49			source of the information.
50	20:14		(1.0)
51	20:15	D :	I think, eh in my view, the source of the information hmm is
52			eh is an article or for other article, and news and examples,
53			or pictures you you saw in everywhere, maybe (.)
54			newspapers↑, maybe the internet↑, maybe your phone↑, eh
55			(.) in all the source for information, offering the information,
56			yeah, (.) I think↓.
57	20:41	Z:	So examples↑ and data or quotations to support your opinion?
58	20:50		(2.0)
59	20:52	D:	Sorry? (1.0) The quotations?
60	20:57	Z:	↓Hmm, the source of the information include the (.) eh
61			examples, or quotations?
62	21:08		(3.0)
63	21:11	D:	hhh (1.0) ↓Hmmm: (tuts)
64	21:14	X:	I think ehm, if the articles - don't mention the real
65			information we couldn't add it into my into our summary so
66			eh whatever the information about eh (1.0) what's it,
67			something, about corruption, they are all (.) about other
68			other things, (1.0) eh, (.) so it's actually (.) true::
69	21:42	D:	=My point is that ↓hmm:, we don't need to give the source
70			of, of information, yeah, and the the summary the the sum
71			the summary should be (.)↑simple, should be- (.), ugh, how
72			to say the word? ((speaks Chinese)) eh::
73	22:03	P:	Simplified, (.) is that the word?
74	22:08		(1.0)
75	22:09	D:	Eh ((repeats Chinese)), eh how do you say? (.) Tidy! Is that
76			right?

77	22:15	P:	Simplified
78	22:17	D:	Simplified. Should be simplified >yeah yeah yeah<
79	22:23	Z:	↓Yeah ((laughs))
80	22:25	D:	Just eh a summary ↓should be simplified
81	22:30	Z:	Yeah a summary shouldn't (have) our own views, own opinion.
82			
83	22:36	D:	Yeah when when someone s- see your summary they they can: understand what it mean at the time- right now, hhh
84			
85			yeah. I think a summary should be that (.) So, I think the last
86			one ↓is false, ↑>it's true, it's true!< Yeah. [It's true.
87	22:54	Z:	[It's true
.	.	.	.

### Glossary of Chinese speech used in transcript

(72, 75) - 精简 = Use few words to express exactly what you mean (simplify)

## 9b.2 Talk-through

### Part 1 (1-45)

D (3) prefaces their turn with the observation that the statement is difficult, and goes on to use a first conditional structure to talk through the implications of the statement. In effect, they believe (4) that you should provide the source of information when making a point (3), but you should not write these points in a summary paragraph (6-7).

Z (11-13) follows up on their own declaration (9) that the statement is true, by using the subordinate structure “cause the summary is about the original article” (11). X ratifies Z's statement (15, 17).

When D (18) asks P to contribute their view, they are overlapped by X (19) who attempts to accentuate the view described by Z, by repeating the deontic modal (“you don't need to give...”).

P (20) shares their curiosity with the group by posing an open question about the meaning of the Statement 9 phrase “the source of information”. This quandary prevails for the next few turns (22-26) as Z (22), and D (24) offer SPPs which consist of potential answers to P's question FPP.

In response to D's (30) request for their opinion, L (31-33) explains the motive for being confused by the statement. They use the subordinating conjunction "because" to explicate their opinion; that "if" they agree with an opinion, they would not put this in a summary.

D (34-35) hedges their response to L (31-33), by using personal fillers and prefacers, such as "I don't know", before voicing the contrary to what they has just said, (that a summary should not contain opinion).

L (36-37) immediately challenges D's statement, twice using the contrastive conjunction "but", as well as the emphatic "just" to emphasise the recency or the group's voicing of the view that opinions should not be included in the summary. L's (36) use of the reporting structure to remind what the collective group has already stated within this discussion, creates a motive for questioning the validity of D's statement. L's (37-38) final statement in this turn is one of anaphoric reference; the subordinating conjunction of consequence: "so", refers back to the contradiction posed by the dominant view of the group. The contradiction which is caused by D's utterance (34-35), is thus posited as the motive for L's confusion.

Z (41-42) offers a suggestion of the meaning of the statement, clarifying that it refers to the issue of whether students should include source details to justify "some reason" in a summary paragraph.

When they take up this task statement again at a later point in the recording, D (47) begins by sighing, which indicates the difficulty felt about this statement. They signposts that they are returning to the final task statement, and states that they are not sure; thus opening the issue up for contributions from others.

In contrast to D's use of the first person subject pronoun, Z (48-49) uses the collective pronoun: "we" to declare the group's predicament of being unsure of the meaning of "source of the information".

D (51-56) responds to Z's (48-49) turn by presenting an explanation of the meaning of "source of information". D's turn is framed with subjective hedging devices, "I think", "in my view", and contains multiple instances of "maybe", as well as

hesitation and pause fillers. In contrast, by mentioning (53, 54, 55) several concrete examples to demonstrate their explanation, e.g. “newspapers” “pictures”; D adds specificity and tangibility.

Z (57) uses the discourse marker “so” and reiterates the key word “examples” in their attempt to confirm D’s meaning. They add two new words to the list offered by D: “data” and “quotations”. By forming this clarification as a question, Z (57) poses a FPP directly to D, which creates the expectation that D will offer confirmation of their meaning or repair if it is different to Z’s understanding. Instead, there is a two-second pause (58), and D (60) comes back in to pose a clarifying question to Z, about their use of the word “quotations”. After Z (60-61) reiterates their point about examples and quotations, there is another pause (62). D (63) responds with a sigh and negative sounds suggest that they disagree with Z, or they are flummoxed. No acceptance of Z’s view is expressed by D, and the conflict remains unresolved.

X’s turn (64-68) embodies an attempt to unpack the statement and rationalise about each point, using conditional and comparative structures such as ‘if...’ or ‘whatever the ...they are all...’. X’s final declaration (68) is made with the concluding discourse marker: “so”, juxtaposed with the emphatic declaration “it’s actually true”.

D’s (69-72) does not comment on X’s point. They use the subjective frame: “my point is”, to return to their view that it is not necessary to provide the source of the information in a summary paragraph. The second part of D’s turn (71-72) takes up the point raised by him at the start of the discussion of this Item (7), that a summary should be simple. This time, D (72) uses the speakers’ common L1, Chinese, to convey the concept of a summary being a simple text. P (73), suggests that the translation required is the word “simplified”, but in response, after a one-second pause, D (75) repeats the Chinese phrase, inferring that they are not satisfied with P’s translation. D (75) then suggests an alternative word “tidy”, followed by the direct polar question - “is that right?”. P (77) repeats their original translation, ignoring D’s suggested translation and their question. D (78, 80) seems to accept P’s translation.

Z (81-82) takes up the TRP and backchannels to the earlier comments in the Item, that a summary should not contain opinions. D (83-85) takes up the TRP to share their view that a summary paragraph should be intelligible for a reader and then concludes the discussion by declaring that the statement is true. D's statement is ratified by Z (87).

### **9b.3 Interpretation - Research questions 1a, 1b, 1c, 1d and 2a**

#### **9b.3.1 Explicit reasoning, relationality, and cognitive openness**

*Research question 1a: To what degree and how do interactants convey explicit reasoning?*

**EXP** - Z (11) uses the subordinate structure "cause" to connect to their explanation that personal opinions should not be included in a summary of an academic article.

**EXP** - D (24, 52-54) provides tangible examples to illustrate their point.

*Research question 1b: To what degree and how do interactants relate to points made by other speakers?*

**REL** - Z (22) and D (23) pick up on P's (20) open question about the meaning of the phrase "source of information". The dilemma reappears when Z (49-50) brings it up again, and D (52-56) responds with tangible examples to illustrate what a source is.

**REL** - Z (58) relates to D's turn (52-56), where they provide a definition of what a source of information may be. Z (58) summarises D's definition using the cohesive marker "so" and upward shift on the word "examples". But Z's summary (58) seems to disturb D (60). D's response (60), delivered after a notable pause (59) suggests that they are surprised by Z's use of the word "quotations". In response to D's request for clarification (60), Z (61-62) reiterates their point about examples and quotations.

REL - The second part of D's turn (72-73) takes up the point raised by him at the start of the discussion of this Item (7), that a summary should be simple. This time, D's self-transact back to their idea about simplicity is taken up by P (74).

*Research question 1c: To what degree and how do interactants manifest cognitive openness in their talk?*

OP - P (20) opens the scope of the discussion by posing an information question about "the source of information" to the group. In this way, P shares their curiosity about the meaning of task statement 9. Others such as Z (22) and D (23) respond to P's question. In the second part of the discussion, the question of the meaning of the phrase "source of information" is taken up again by Z (49-50) and D (52-53).

OP - On their second airing of the concept of a summary being a simple text, D (71) opts to suggest a Chinese translation of the word "simple", thus opening up the discourse for others to discuss what the translation should be.

*Research question 1d: How do explicit reasoning, relationality and cognitive openness combine in the interaction?*

In several turns in this Item, relationality embodies explicit reasoning. When Z (48-49) and D (52-53) take up the issue of raised by P of how to interpret the meaning of the phrase "source of information", they combine *relationality* with *cognitive openness*.

Relationality is evidenced when P (73) picks up on D, responding to their request for a translation of a Chinese word by offering a suggestion. By formatting their suggestion "simplified" as a question P also conveys openness.

D (75-76) displays *explicit reasoning* but also *cognitive openness* by using a question format to suggest possible translations of a key word in the discussion. By using the group's shared first language (Chinese), D relates to the others and engages them in a tangential question of what the translation might be.

Z (81-82) shows *relationality* when they pick up on the others' view that a summary paragraph should be simplified. Z shows agreement with the others "yeah" then uses *explicit reasoning* to explain that one's own views should not appear in a summary paragraph in order to achieve simplification.

### 9b.3.2 Evidence of CKC and prolongation of interaction

**Research question 2a:** *How is collective knowledge construction evidenced in the interaction?*

**Table 4-19 Evidence of CKC and prolongation item 9b**

Item 9b. Change, challenge, prolongation of interaction, emergence of new idea, follow-up of idea	
Change of a speaker's own view	no
Challenge of another speaker's view	yes
Prolongation of interaction	yes
Emergence of new idea	yes (9 instances)
Follow-up of idea	yes (5 instances)

#### **Change of a speaker's own view**

There is no evidence of change of a speaker's own view.

#### **Challenge of another speaker's view**

L (36-37) challenges the validity of D's statement (34-35). L's use of the contrastive discourse marker "but" indicates that they do not accept D's point, and the adverbial in the reporting structure "we just said" (36) emphasises the recency of the CKC, which consisted of the view that a summary should not include opinion.

D's response (60) to Z (58) conveys challenge. D's (60) upwards intonation on the word "quotations" expresses disbelief. After Z (61-62) reiterates their explication, a three-second pause (63) heightens the tension of dissonance. D's sigh and tutting sound (64) suggests that they are unaccepting of Z's explanation of "sources of information".

### **Prolongation of the interaction**

There is prolongation of interaction when Z (22) and D (23) respond to P's (20) open question about "the source of information", by proposing possible interpretations. Prolongation of discussion of this issue continues later (49-50, 52-53).

Prolongation of interaction occurs through the debate about what the English translation of an L1 phrase should be (74-79).

### **Emergence of new idea**

D's (3-7) initial turn incorporates three new ideas- i. that if you agree you should provide a source in an essay, ii. a source can prove information and iii. a summary is short so may not include opinion.

Z (11) contributes the idea that a source is about an original article and should not therefore show the opinion of the (student) writer.

P (20-21) introduces the meta notion of questioning the meaning of the task statement itself. The meaning of the phrase "source of information" becomes a sub-theme in the discussion.

The notion of inclusion of one's voice in a summary text is introduced by L (32-33), (36-37), who widens the scope of the discussion by distinguishing the notion of opinions which are intrinsic in an article, from those which the student writer may hold.

D's (52-56) contributes a list of tangible items to illustrate what is encompassed by "source of information".

X (65-68) suggests the idea that a (student) writer should not incorporate sources if these are not included in the original article. Secondly, they contribute the point that articles can be about many different topics, providing an example of one possible topic, "corruption", to illustrate this.

When D (72-73) raises the question of what the translation of a Chinese term might be, this raises a new dimension in the discussion.

In their final turn in this Item, D (84-85) introduces a new idea, that of deixis, by suggesting that a summary carries particular meaning at a particular time.

### **Follow-up of idea**

There are a few lines of follow-up of idea going on in this Item.

In (41-42) Z follows up the discussion of the sub-theme “source of information” by explaining that the practice of using the source involves providing details to justify one’s point of view.

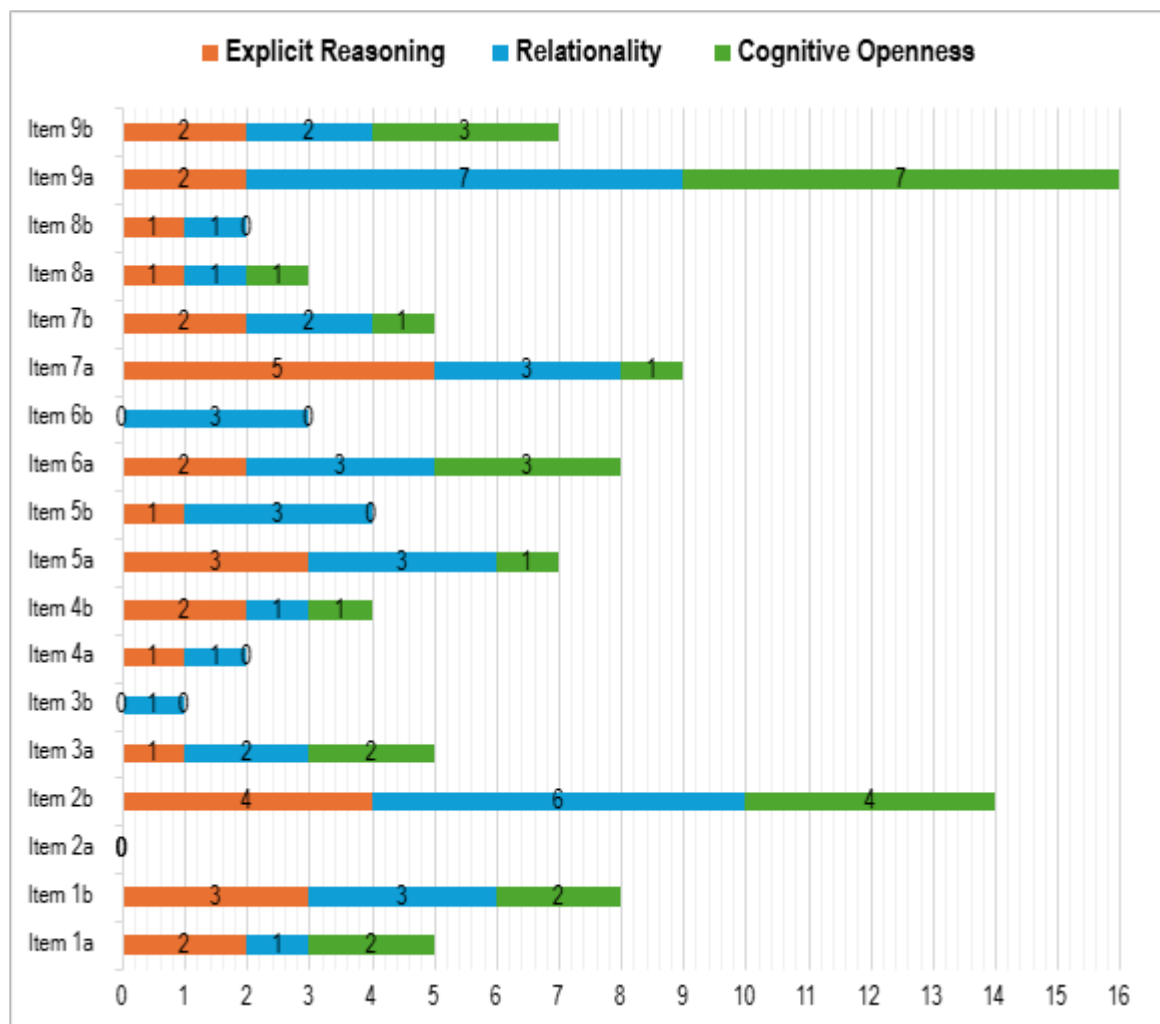
By providing concrete examples such as “news”, D (24) builds on Z’s (22) more abstract illustration of the phrase “source of information”, which they said was “examples or quotations”. This line of development recurs later in the discussion of Statement 9, and is expanded more in lines (51-61) by D and Z.

One idea which is taken up and developed from (72-79) is the notion of what a suitable word might be for the concept expressed in Chinese by D, the group settle on the word “simplified”. Z (81-82) develops the notion of what “simplified” entails by equating it with the avoidance of including one’s own opinion in a summary paragraph.

A final new idea is proposed by D (83-86) when they suggest the notion of deixis as a factor which affects a reader’s understanding of a summary. D does not pursue this line of the discussion and leaves no gap for the idea to be followed up by others. Instead D continues their turn by using the resultative “so” to conclude the discussion of the item. In their concluding statement, D (86) repeats the stance that the statement is true, using both upward shift and extra speed to emphasise their view. Z (87) ratifies this conclusion by overlapping D’s turn with the same phrase “it’s true”.

## 4.2 Summary of Findings of the Data Analysis

Task items range in length from 20 seconds to 450 seconds. Whilst there are some shorter Items which contain few or no instances of transactivity: **2a**, **3b**, **4a**, **6b**, there are others such as **1a**, **5b** or **8a**, which show multiple instances of transactivity. Therefore, there is no clear relationship between length of Item and transactivity. As shown in Figure 4.1, the lengthiest Items in the data set: **1b**, **2b**, **5a**, **6a**, **7a**, **9a**, and **9b**, show high levels of the three dimensions of transactivity. These Items also contain several instances of new idea and development of idea. However, only one of these Items (Item **9a**) contains evidence of change of a speaker's own view, and three out of the five (Items **2b**, **9a** and **9b**) display evidence of challenge of another speaker's view.



**Figure 4-1 Instances of transactive dimensions in each Item**

The analysis of the data set shows that transactivity was omnipresent in the interaction overall. Some task items showed multiple instances of the three dimensions of transactivity; for example, in Item **2b** explicit reasoning, relationality and cognitive openness are all abundant, whilst in **9a**, there are numerous instances of relationality and openness. The exceptions are Item **2a**, which shows no evidence of transactivity, and **3a** and **4a** which show minimal transactivity. Items with little or no evidence of transactivity will be discussed in chapter 5 in relation to the implications of this for research question **2b**.

### **4.3 The effect of linguistic features on transactivity**

The following section highlights evidence found in the analysis of the linguistic features identified in chapter 2, Table 2-1. Given the overlap of dimensions related to some linguistic features, see chapter 3, Figure 3-1, items are categorised and reflected in separate tables 4-20, 4-21, and 4-22, in relation to the dimension of transactivity most associated with the feature as discussed in chapter 2, sections 2.2.1, 2.2.2 and 2.2.3, respectively. Table 4-23 displays evidence of emergent linguistic items considered to contribute to transactivity in the interaction.

Note that as explained in chapter 3, section 3.3.1.1., items are documented according to their location in the transcript. The line number where an item is located is shown in parenthesis, preceded by the initial letter of the pseudonym used for a given speaker. The system applied in the corresponding figures 4-2 (linguistic features indicating explicit reasoning), 4-3 (linguistic features indicating relationality), and 4-4 (linguistic features indicating cognitive openness) respectively demonstrates a quantitative representation calculated on a scale of 0 to 4, with 4 signifying abundant instances of an item, 3 for several instances, 2 for 2 instances, 1 for 1 instance, and 0 for no instances.

These data findings support the notion that particular linguistic structures facilitate explicit reasoning, relationality and cognitive openness. For example, reporting structures such as “as you said” increase relationality, while hedging structures facilitate cognitive openness as suggested in chapter 2 (Howley et al.,

2013b., p. 184). The use of conditional tense is found to be impactful for speakers to hypothesise about their theses in a way that transmits cognitive openness. For example, in Item 2b, L's (11) use of language of hypothesis to introduce a new idea that the original text might be very short results in another speaker X (14) contributing to the discussion.

**Table 4-20 Evidence of linguistic features associated with Explicit Reasoning**

<b>FEATURE</b>	<b>Meta phrase "for example"</b>	<b>Causal mechanisms</b>	<b>Consequence "So"</b>	<b>Framing for reformulation</b>
<b>Item 1a</b>	-	"cause" used twice by J (6) to explain reason for their view	"so" is used by J (10) and X (16) to link their reasoning to the action of what to do. It is also REL since by using it X mirrors J's output.	-
<b>Item 1b</b>	-	"because" (71)	"so" used by Z (65) to link their reasoning to their answer.  "then" used by D (77)	-
<b>Item 2a</b>	-	-	-	-
<b>Item 2b</b>	"for example" (78, 97)	"because" (30)	"so" (21)	"you say..." (111)
<b>Item 3a</b>	-	"cause" (3)	-	-
<b>Item 3b</b>	-	-	-	-
<b>Item 4a</b>	-	"because" (4)	"so" used in (5)	-
<b>Item 4b</b>	-	"because" (6)	-	-
<b>Item 5a</b>	"for example" (21), (37)	"cause" (21)	-	-
<b>Item 5b</b>	-	-	-	-

Item 6a	-	-	“so” (22)	-
Item 6b	-	-	-	-
Item 7a	-	-	“so” (29)	-
Item 7b	-	“because” (6)	-	-
Item 8a	-	-	“so” (2)	-
Item 8b	-	-	-	-
Item 9a	-	“because” (81)	“so” (14, 70)	“oh you think...” (25) “what I mean...” (67)
Item 9b	“for example” (23, 25)	“cause” (11) “because” (31)	-	Z frames reformulation of D’s point with discourse marker “so” (57) “my point is that...” (69)

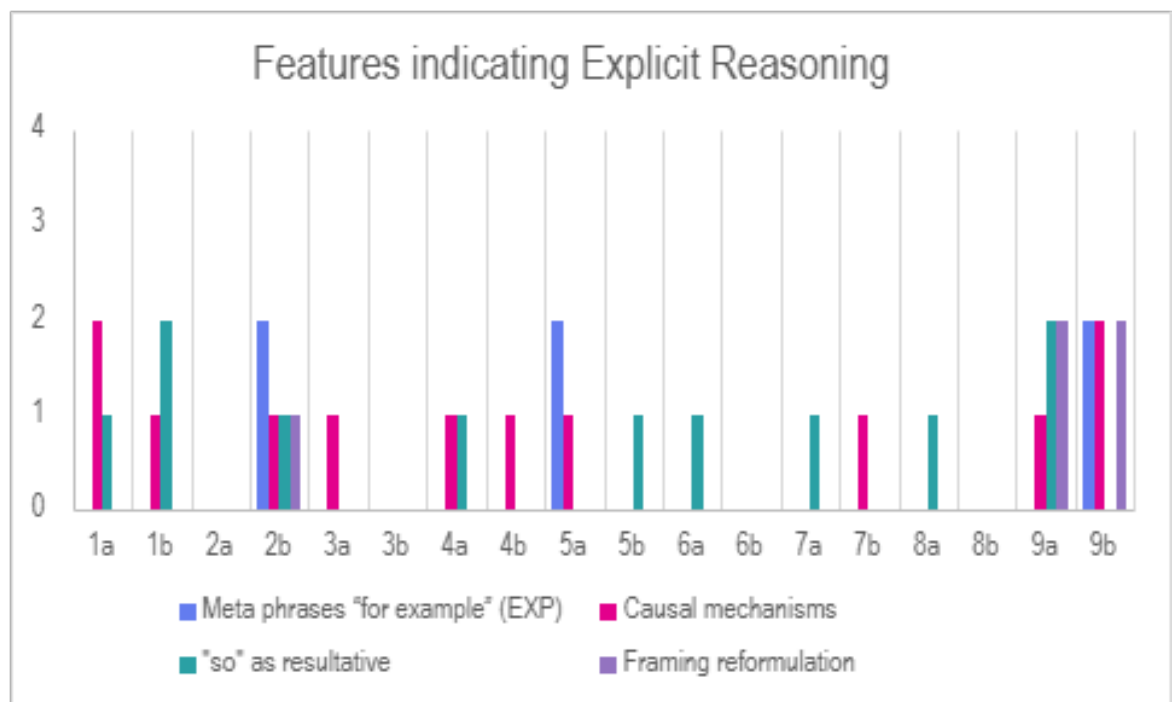
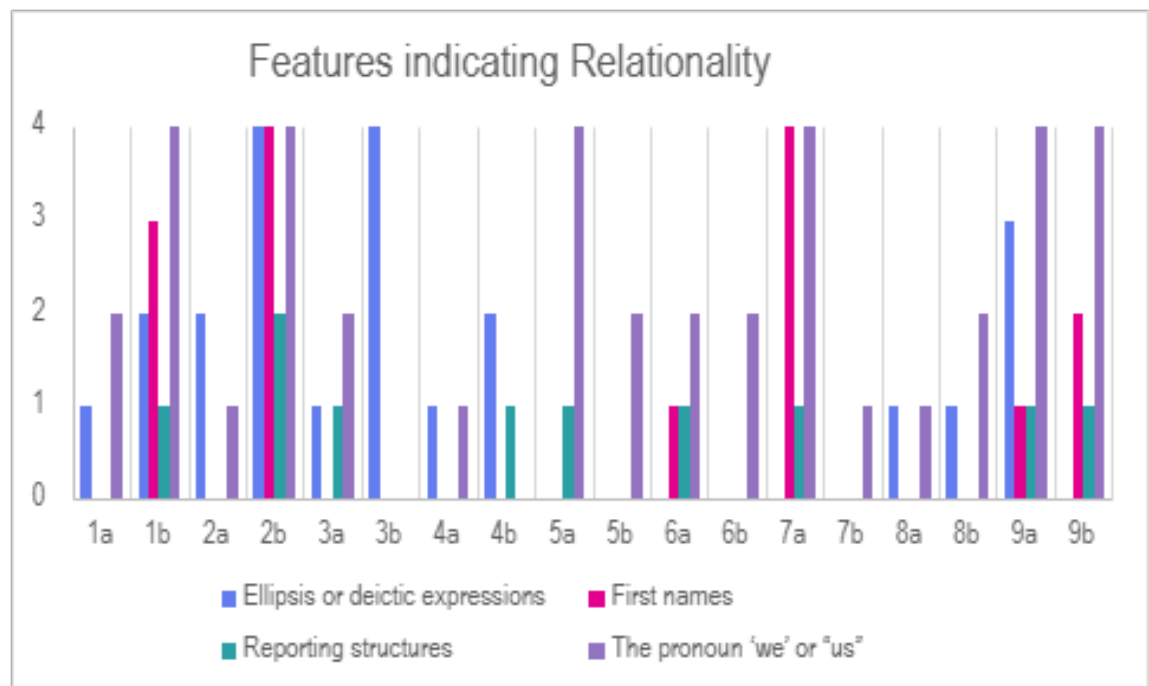


Figure 4-2 Features indicating Explicit Reasoning

**Table 4-21 Evidence of linguistic features associated with Relationality**

<b>FEATURE</b>	<b>Ellipsis or deictic expressions, the use of “it”</b>	<b>First names</b>	<b>Reporting structures</b>	<b>The pronoun “we” or “us”</b>
<b>Item 1a</b>	J (9) uses “it” to refer to the article	-	-	“we” used by J and X, explains what the group should do
<b>Item 1b</b>	“it” used by Z (72, 74) to refer to article  “it says fully understanding” (76)	Several uses of participants’ first names	“it said” X (25)	“we” common throughout item. Eg. Z (64, 71, 72) uses “we” and “us” (74)
<b>Item 2a</b>	“this one” (8), “it” (17) are examples of ellipsis	-	-	“we” (15) juxtaposed with modal (should) refers to what the collective should do
<b>Item 2b</b>	Common use of “it”, e.g. (42, 53)	Abundant use of first names, e.g. (61)	“it says” (19)  “the worksheet said...” (35)	Abundant use of “we” e.g. (72, 78)
<b>Item 3a</b>	“it” (7)	-	“it said” (10)	“we” (4, 11)
<b>Item 3b</b>	Abundant use of “it”	-	-	-
<b>Item 4a</b>	“it” (6)	-	-	“we” (5)
<b>Item 4b</b>	“it” (7, 10)	-	“it mentioned” (7)	
<b>Item 5a</b>	-	-	“just as said in the second one” (17)	Abundant use of “we”
<b>Item 5b</b>	-	-	-	“we” (5, 7)

<b>Item 6a</b>	-	First name is used (3)	“as Sing said...” (3)	“we”
<b>Item 6b</b>	-	-	-	“we” (5, 7)
<b>Item 7a</b>	-	First name vocatives used several times (19, 38, 53, 54)	“...what you said” (12)	Abundant use of “we”
<b>Item 7b</b>	-	-	-	“we” (9)
<b>Item 8a</b>	“it” (5)	-	-	“we” (2)
<b>Item 8b</b>	“this” (11)	-	-	“we” (9, 10)
<b>Item 9a</b>	Several instances of ellipsis- “if the meaning is what you said” (57)	First name used (71)	“what you said” (57)	Abundant use of “we”
<b>Item 9b</b>	-	First names used by D to ask others’ opinions (18, 30)	“we just said” (36)	Abundant use of “we” (12), “our” (13)



**Figure 4-3 Features indicating Relationality**

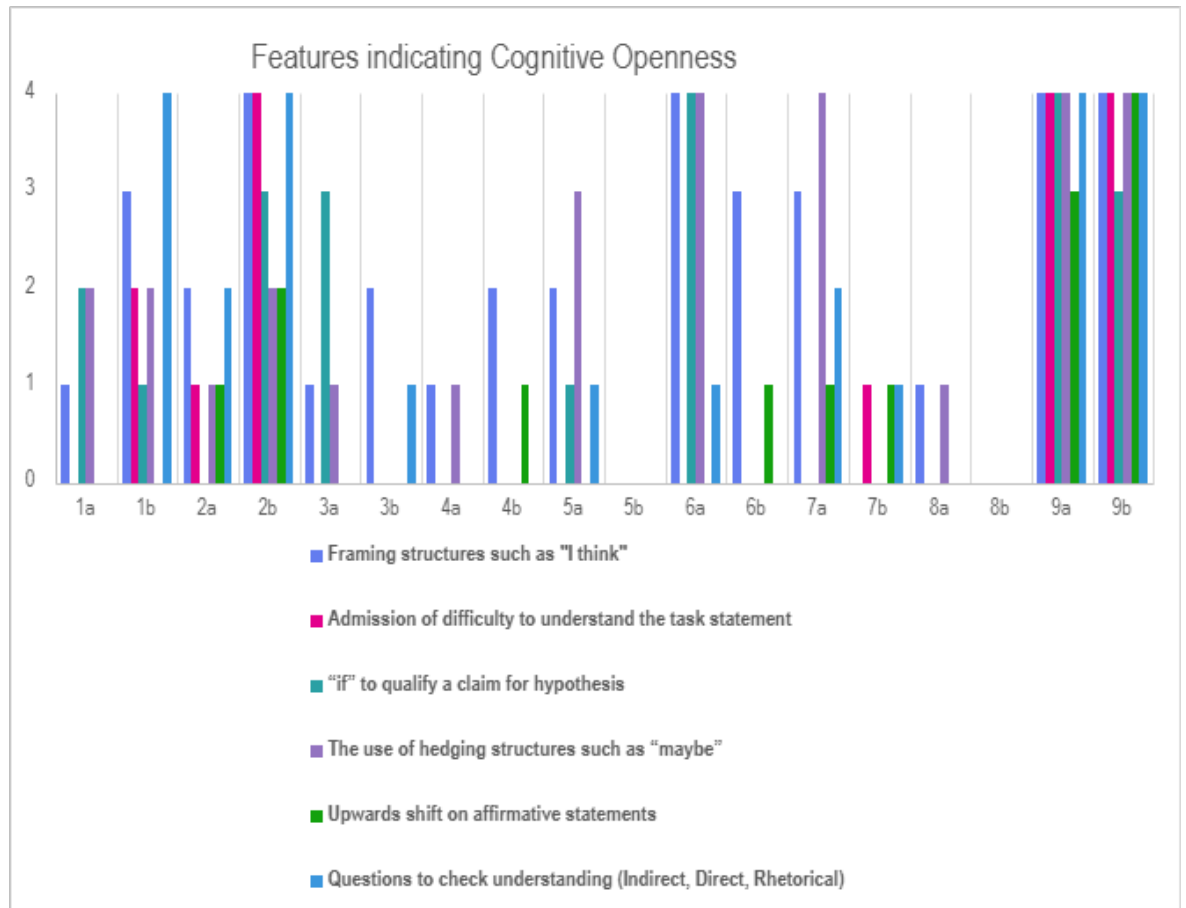
Table 4-22 Evidence of linguistic features associated with Cognitive Openness

FEATURE	Framing structures using hedging such as “I think...”	Admission of difficulty understanding task statement	“if” to qualify a claim for hypothesis	The use of hedging structures such as “maybe”	Upwards shift on affirmative statement	Questions to check understanding, direct questions, rhetorical questions
<b>Item 1a</b>	J (3) uses hedging frame “I don’t really think...”	-	“if” is used by J and X	J uses “maybe” twice in his long turn	-	-
<b>Item 1b</b>	Frequent hedging with “I think” and “I’m not sure” e.g. Z (11, 12), L (35)	“I don’t understand what it means...” (50-51) “I’m not sure what it means...” (60)	“if” used by P (51-53)	“maybe” used by X (26), L (36)	-	Many direct questions, e.g. “what about others?” (45); “what do you think?” (62)
<b>Item 2a</b>	“I’m not very sure”, (7), and “I think” (11, 15)	“I have no idea...” (17)	-	“maybe” (11)	There is upwards shift (20) in relation to the functional issue of how to proceed rather than epistemic question.	Direct question about others’ opinions (12, 14)
<b>Item 2b</b>	Abundant use of “I think” “I	Frequent puzzling over	Several instancing of	Many instances of “maybe”	“you know what I mean” (50), “Pan and me	Abundant direct question, e.g. « can it be more

	don't think"	numerical meaning (4-5), (6), (43), (91-92)	hypothesis with "if" "what if I write..." (11), (20)  What if I write 60 words? (98-99)	e.g. (17, 60)	think it's false right?" (53)	specific?" (106)
<b>Item 3a</b>	"I think" (7)	-	"if we can" (3, 4); "if we can not" (11)	"maybe" (7)	-	-
<b>Item 3b</b>	"I think" (8, 10)	-	-	-	-	"you sure?" (5)
<b>Item 4a</b>	"I think" (3)	-	-	"maybe" (3)	-	-
<b>Item 4b</b>	"I don't know if I am right" (6-7), "I think" (11)	-	-	-	"it's false, yeah?" (15)	-
<b>Item 5a</b>	"I also think..." (20)  "I think" (35)	-	"if we contain all the information..." (16-17)	"maybe" (5, 6, 7)	-	"what about you?" (8)
<b>Item 5b</b>	-	-	-	-	-	-
<b>Item 6a</b>	Abundant use of "I think"	-	"if" is used 6 times (4, 5, 11, 19, 21, 23)	"maybe" is used 4 times	-	"... true or false" (26)
<b>Item 6b</b>	"I think" (9, 10)	-	-	-	Upwards shift on D's statement that it is not necessary	-

					to change the order (5)	
<b>Item 7a</b>	Abundant use of “I think”  “I’m not very sure...” (26)	-	-	Abundant use of “maybe”	“It’s true right?” (37)	Direct questions (38, 47)
<b>Item 7b</b>	-	Explicit challenge - “I don’t understand what you mean” (4)	-	-	“it’s true?” (14)	Direct question (4)
<b>Item 8a</b>	“I think” is used twice (1, 5)	-	-	-	-	-
<b>Item 8b</b>	-	-	-	-	-	-
<b>Item 9a</b>	Abundant use of “I think”	“I’m confused” (45)  “I’m not sure the sentence meaning” (49)  “if the meaning is what you said...” (57)  “I don’t I’m not very sure about the	Abundant use of conditional with “if”  “if it means...” (27)	Abundant use of “maybe”	Upward shift (7, 8, 18)	Several uses of direct questions (15-16, 25-26, 61-62, 88)  Information checking question (54)

		meaning of it” (74)				
<b>Item 9b</b>	Abundant use of “I think” “I’m not sure” (27) Hedging with “quite” (31)	Overt admission of difficulty (3, 31) “I don’t know...” (34) “I’m a little confused” (37-38) “we are not sure” (44-45)	Conditional with “if” (3-4, 32, 64, 83-85)	Abundant use of “maybe” (26)	Upward shift used by D (7) to posit view Upward shift for suggestions (54) The use of “sorry” with upwards shift (59) “The quotations?” (59) Z (60-61)	Abundant direct questions  Information checking question (20-21)



**Figure 4-4 Features indicating Cognitive Openness**

Linguistic features which are not discussed in chapter 2 but which emerged as significant during the data analysis are listed below and shown in relation to each item in Table 4-23. There is discussion of the impact of these features in chapter 5.

List of emergent linguistic features:

- i. The use of “just” as a softener (Carter & McCarthy, 2006, p. 99).
- ii. The use of the discourse markers “so” “well” “actually” for conveying stance (Carter & McCarthy, 2006, p. 214, p. 223).
- iii. Recursive lexis and structures.

- iv. The use of speakers' shared first language.
- v. The use of the first and second person pronoun.

**Table 4-23 Emergent linguistic features in dataset**

LINGUISTIC FEATURE	Emergent features not in Table 2-1
Item 1a	<ul style="list-style-type: none"> <li>i. The use of the softener “just” (4, 6, 15)</li> <li>ii. The use of the discourse marker “so” (3)</li> <li>iii. Recursive lexis</li> </ul>
Item 1b	<ul style="list-style-type: none"> <li>i. The use of “just” (73)</li> <li>ii. The use of “so” (43) to frame question, and (76) to conclude group decision</li> <li>iii. Recursive lexis</li> <li>iv. Use of shared first language (Chinese) (9, 14, 18, 20)</li> </ul>
Item 2a	<ul style="list-style-type: none"> <li>ii. Discourse markers “Oh well”, “actually” (7) or “so” (19)</li> </ul>
Item 2b	<ul style="list-style-type: none"> <li>ii. Discourse marker “so” (110, 123)</li> <li>iv. Use of Chinese (81, 87)</li> </ul>
Item 3a	<ul style="list-style-type: none"> <li>ii. Discourse marker “so” (10) to frame reasoning</li> </ul>
Item 3b	-
Item 4a	-
Item 4b	<ul style="list-style-type: none"> <li>v. The use of the second person pronoun- “your summary” (11)</li> </ul>
Item 5a	<ul style="list-style-type: none"> <li>ii. Discourse marker “so” (1, 12)</li> </ul>
Item 5b	<ul style="list-style-type: none"> <li>i. The use of “just” (9)</li> <li>iii. Recursive lexis</li> </ul>
Item 6a	<ul style="list-style-type: none"> <li>ii. Discourse marker “so” (26, 27)</li> </ul>
Item 6b	<ul style="list-style-type: none"> <li>ii. Discourse marker “so” (9)</li> <li>v. The use of the second person pronoun- “you” (13)</li> </ul>
Item 7a	<ul style="list-style-type: none"> <li>i. Emphatic language “neither eh before or after” (42-43)</li> <li>ii. Discourse marker “so” (35, 46)</li> </ul>

	iii. Recursive lexis
Item 7b	ii. Discourse marker “so” (14)
Item 8a	ii. Discourse marker “so” (9)
Item 8b	i. The use of “just” (14)
Item 9a	i. The use of “just” (81) ii. Use of discourse marker “actually” (65)
Item 9b	i. The use of “just” (34) iv. Use of Chinese (72, 75) v. Use of personal pronouns “I” (3-4), “you” (19) ii. The use of “actually” (68)

#### 4.4 Indicators of CKC in the dataset

Summary table 4-24 shows each of the four indicators of CKC found in the data and the number of instances of these observed for each Item in the analysis. The duration of each Item is shown in seconds and is noted in the table due to its relevance to the understanding of the construction of knowledge in group task-based work (van Heijst et al., 2019, p. 170 ). As is outlined in section 3.3.3.1, prolongation is taken into account in the present study because of its relation to the potential for the emergence of CKC.

**Table 4-24 Summary of items with duration in seconds and indicators of CKC**

Item duration in seconds	Change of a speaker's view	Challenge of another speaker's view	New idea with number of instances in brackets.	Follow-up of idea with number of instances in brackets.
1a 50"	NO	NO	YES (2)	YES (1)
1b 260"	NO	YES	YES (4)	YES (1)
2a 60"	NO	NO	YES (1)	NO
2b 400"	NO	YES	YES (10)	YES (9)
3a 60"	NO	YES	YES (2)	YES (2)
3b 20"	NO	YES	NO	NO
4a 30"	NO	NO	YES (1)	NO
4b 45"	NO	NO	YES (1)	YES (1)
5a 170"	NO	NO	YES (6)	YES (3)
5b 20"	NO	NO	YES (2)	YES (1)
6a 168"	NO	NO	YES (3)	NO
6b 40"	NO	NO	YES (1)	NO
7a 240"	YES	YES	YES (4)	YES (2)
7b 45"	YES	YES	YES (3)	YES (3)
8a 40"	NO	NO	YES (1)	YES (1)
8b 35"	NO	NO	YES (2)	YES (1)
9a 450"	YES	YES	YES (9)	YES (2)
9b 360"	NO	YES	YES (9)	YES (5)

The table above provides an overview of findings by Item. Items 2a, 3b, 4a, 6a and 6b have no indicators of follow-up of idea. Items 1a, 1b, 2b, 3a, 4b, 5a, 5b, 7a, 7b, 8a, 8b, 9a, 9b display indicators of follow-up of idea.

The analysis shows considerable differences in the length of prolongation of talk between the two groups. For example, Statement 2 takes 60 seconds for Group a to discuss, whilst the same Statement is discussed for 400 seconds for Group b. Task items 2, 3 and 4 demonstrate a difference between Group a and Group b in terms of follow-up of new idea.

## **Chapter 5 Discussion**

### **5.1 Overview and outline**

This chapter addresses research question 2b, by discussing how transactivity affects CKC in the interaction at the centre of the present study. The chapter is based around the key themes set out in chapter 2, and incorporates the insights and knowledge gained from the work produced in response to research questions 1a, 1b, 1c and 1d, about the nature of transactivity in the interaction, as well as to research question 2a, about the indicators of CKC in the interaction.

This chapter builds on the findings presented in chapter 4, by examining them in relation to research question 2b. I do this by selecting pertinent excerpts from the data set to illustrate how the dimensions of transactivity match the indicators of CKC and assess the effect of this. In this way the theoretical premises established in chapter 2 can be supported or challenged in the context of the present study.

Research question 2b aims to connect visible aspects of the interaction with the more tacit ones. Whilst I have found it helpful in chapter 4 to consider each of the three dimensions of transactivity separately for the purposes of gaining a comprehensive understanding of the construct itself, the approach to spoken interaction in the present study is one in which multiple facets are integrated.

The discussion of research question 2 hinges on the impact of transactivity on CKC by considering the implications of transactivity for each of the four indicators of CKC individually: change of a speaker's own view, challenge of another speaker's view, the emergence of new idea and the development of ideas in the interaction. Following that, the effect of transactivity on CKC is evaluated more holistically, and conclusions are presented about the relevance of transactivity on CKC. That part of the chapter will be orientated around the most impactful aspects of interaction affecting CKC, namely the emergence of new idea and development of idea. The discussion will also consider the effect of knowledge creation discourse and the significance of shared objects in the interaction.

## 5.2 The effect of the task

As discussed in chapter 3, section 3.4.5, the dataset shows that in some items the meaning of the statement itself led to intensified group discussion. In task items 1 and 2, the meaning of the statement is discussed at length by Group b whereas Group a conclude their discussion much more promptly. The reasons why Group b's discussion of items 1 and 2 is around 5 and 6 times longer than Group a's discussion of those items is a potential topic of investigation for a comparative study which would try to determine the effect of different aspects of group dynamics for example. In the present study, for the purpose of considering the effect of the task itself on the ensuing discussions, I will focus on items where the two groups produced a similar length of discussion, i.e. Item 8 and Item 9. Before commencing the task, participants were instructed to discuss and try to reach an agreement about the best answer. In other words it was not mandatory to reach convergence. The notion that there may not even be a definitive correct answer aligns with Koschmann's (2013, p. 164) assertion that understanding should be construed as an interactional accomplishment whereby the prolongation of the talk itself is an achievement as opposed to a curricular competency.

Where the data shows that both groups have a similar discussion time for a task item, it may be indicative of the scope of discussion triggered by the task statement. In the case of Item 8, discussion time for both groups is relatively short at 40 seconds or less. Discussions for both groups contain new idea, and although there is follow-up of idea, with evidence of cognitive openness in group a, neither group prolong the discussion with any indications of intersubjective depth. The task statement, that it is better to produce one's own preparatory notes before writing a summary, seems not to lend itself to any debate about how it should be interpreted. The data for Item 9 embodies the contrary to Item 8 in that both groups prolong and develop the discussion.

Item 9 invoked similar performance between Group a and Group b with discussions of several minutes in length as speakers puzzle over the meaning of the task statement itself. Both have numerous instances of the three dimensions of transactivity, although Item 9a demonstrates more relationality compared to Item 9b. Both groups discussions of Statement 9 show many instances of new idea and follow-up of idea. Language of hypothesis is used to communicate speculation as

speakers describe different possible scenarios. The inclusion of meta declarations such as “we now have some argument about the real meaning of this sentence” in Item 9a (95-96), contributes to the level of collectivity in the group.

### 5.3 The impact of emergent linguistic features

As seen in Table 4-23, several emergent linguistic items which contribute to transactivity in the interaction are found in the dataset. A further study would be useful to investigate the effect of these features in more depth.

There is frequent use across the items of the softener “just” (Carter & McCarthy, 2006, p. 99), which conveys subtlety in a speaker’s stance. This feature may be said to enhance explicit reasoning and therefore affect relationality and engagement among speakers.

Discourse markers “so” or “well” and “actually” are used for openings or closings within spoken interaction (Carter & McCarthy, 2006, p. 214). This enables uptake on points made by others or self, according to Chi, Hutchinson et al. (1989) and is associated with relationality (Gosen et al., 2024, p. 9)(Items 1a, 1b, 2a, 2b, 3a, 5a, 6a, 6b, 7a, 7b, 8a).

Recursive lexis whereby a speaker replicates lexis used by a partner speaker in a following turn enhances relationality by binding content. This happens in Item 1a when X replicates J, both with the lexical item “just key words” and with the resultative linking adjunct “so”. Item 1b also provides an example of how recursive lexical-grammatical items may enhance relationality as well as explicit reasoning. This can be seen when L’s (32) emphasis of the word “main” is picked up by other participants: P (51) (60) and Z (74). The recurrent adjectival phrase embodies a node which is used as a common denominator for speakers to connect back to L’s point.

Recursive lexis is also present in item 5b when D repeats P’s phrase “the key information”. P (7), relates to Z’s affirmation that a summary should not have many details by introducing the phrase “key information” to the discussion. The same phrase is used again by D (8), then by P (10). The reiteration of this phrase, as well as its dominance of the final part of the discussion, contributes to the

construction of the group consensus that Task Statement 5 is false. In Item 7a, the word “original” is introduced by J (5) to emphasise the status of the article that they would have to summarise. This word is picked up by J in a self-transact (21) and later by X (27). In the same Item, X (42-43) picks up on L’s turn (32-33) by recurring to the lexis introduced by L “before or after”.

The use of speakers’ shared first language. This occurs only in items by group b, and is not widespread in the dataset as a whole. Item 9b evidences the most significant use of the speakers’ L1 and this is discussed in the next section due to the association made with explicit reasoning and relationality.

The use of the first and second person pronoun. Whilst there has already been recognition in the present study of the significance of the collective pronouns “we” and “us”, for their effect on relationality, first and second person pronouns are highlighted in Items 4b, 6b and 9b. The use of these pronouns as alternatives to the more widely used “we” could be the topic of a study in the area of philosophy of language. In the present study, the use of “you” seems to replace “we” in Item 6b but still has a the notion of a collective action. The use of “I” could be a sign of visible thinking where the speaker talks through there ideation in Item 9b, for example.

#### **5.4 The speakers’ common first language as a resource**

The use of the speakers’ shared L1 (Mandarin) emerged as a relevant factor at the data analysis stage of the present project. It was therefore not discussed in the literature review but became salient in the analysis as I detected that speakers in Group b used their common first language to help them in the discussion of Statements 1, 2 and 9. On further examination I deduced that this practice enhances relationality as it helps the speakers relate to one another via their common L1 discourse and strengthens the notion of shared space. The use of the L1 is also claimed in part 2 of the interpretation section to be significant for CKC as it introduces new dimensions about meaning into the discussion as participants offer translations of terms and sometimes this invokes debate. Swain and Lapkin (2000) found that learners who shared the same L1 would revert to using their first language during L2 lead tasks for three motives: for the management of task procedures, to consolidate attention whilst referring to lexico-grammatical issues,

and for interpersonal interaction during off-task turns. There is one example of the use of the L1 in an off-task turn in Item 2b (3). Apart from that, in the findings of this data analysis, the use of L1 is limited to task-based knowledge construction. By looking at the instances of L1 in Items 2b and 9b, the effect of reversion to shared L1 may become apparent.

In Item 2b, L (82) (88) reverts twice to the language of Chinese, using single words to try to convey their point. This encourages the other participants to suggest translations of the Chinese phrase into English. L effectively operates on the collective linguistic resources in an attempt to develop the discussion. The implications raised by the use of the speakers' shared L1 can be categorised as *cognitive openness* due to the suggestion of alternative translations, as well as constituting an instrument of prolongation of the talk as speakers P and D (74-78) debate possible translations for the L1 phrase. Interaction is prolonged, and it can be argued that group knowledge building is enhanced through the new dimension of how to convey a concept in a different language. As well as implications for knowledge construction, the use of code-switching by learners in Group b contributes to the positive dynamics of the group discourse and seemed to strengthen relationality between the group members.

### **5.5 The link between transactivity and change of a speaker's own view**

As seen in chapter 2, change of one's own view is interdependent with cognitive openness as it implies a willingness to reconsider and adapt opinion. However, as is demonstrated in Item 7a, change of a speaker's own view may not result in knowledge construction. Although Y (10-13) explicitly states that they have changed their view due to the contributions of other speakers in the discussion, namely J (4-6), Y does not explain the epistemic rationale for their change of opinion and there is no development of the theme.

A similar situation emerges in Item 7b. There is evidence that D experiences a change of view, from (4) where they display scepticism about the answer by challenging X, to (12), where they overtly state that the others are right about the task statement being true. However D includes no explicit rationale for their new opinion, and fails to engage intersubjectively with the others.

The conclusion that can be drawn from the data analysis in the present study poses a challenge to Schwarz and Baker's (2017) claim that knowledge building through speaking implies changes in viewpoint. The present study finds that change of one's view does not a priori lead to CKC, just as CKC is not contingent on the occurrence of a change of view.

## 5.6 The link between transactivity and challenge of another's view

The analysis findings show evidence of challenge of another speaker's view in 8 Items; 1b, 2b, 3a, 3b, 7a, 7b, 9a and 9b. Challenge is often linked to prolongation in the interpretation section of the data analysis. For example, in Item 3a, Y challenges J and this seems invoke *relationality*, leading to X's knowledge creation discourse as they suggest that the notion of summarising an article in only one sentence is only a possibility. Similarly, in Item 7b *relationality* is invoked when D expresses challenge. Other speakers engage in the dialogue to pick up on the challenge and this leads to the reformulation of language, as the word "judgement" is used by X to paraphrase Z's word "opinion" in response to the challenge voiced by D (4).

In Item 9a, X (60-61, 87) presents a challenge to the S (46) to explain why they should other sources of information. This leads to prolongation of the discussion and engagement of other speakers S (66-69) and A (89) who invoke knowledge creation discourse in their responses to X. In Item 9b, L (36) challenges the rest of the group by using "but" to frame their explicit point that the group are contradicting themselves. This prolongs and adds intensity to the discussion, and leads to follow up by others.

In Item 7a, X challenges L's view and therefore displays *relationality* but X does not elaborate to offer any *explicit reasoning* or *cognitive openness*.

It can be concluded from these examples that transactivity is necessary for challenge to be voiced, as by default a speaker must engage with another's view to disagree with it. However, if *explicit reasoning* is absent, this process does not lead to CKC.

## 5.7 The link between transactivity and idea emergence

As discussed in chapter 2, the emergence of new idea is claimed to be of vital importance to CKC (Damşa et al., 2010, p. 149). The data analysis findings support the claim of van Heijst et al. (2019), that the emergence of new idea is affected by cognitive openness. This is because the expression of uncertainty prolongs knowledge building interaction, by eliciting views from other participants as well as by recognising the existence of alternative views to the one a speaker is positing. In Item 7a, J (19-20), demonstrates overt cognitive openness by contemplating Y's (10-13) view that the summary need not include the writer's opinion. By engaging explicitly with Y's view, and revealing their own view, J increases intersubjectivity in the shared space and the potential for the process of CKC to expand. The reason CKC does not develop in this Item is due to the lack of follow-up from other participants in the interaction.

The data analysis has revealed evidence of the emergence of new idea in the interaction. The following section evaluates this evidence to assess the impact of instances of new idea on CKC in the two groups. In Items 6a and 6b there are instances of new idea, but there is a lack of intersubjectivity in terms of probing and deepening of views. New ideas in Item 6a are presented clearly by speakers and would merit the deepening of the discussion. For example L's (10-12) notion that there may be special situations which require a non-standard approach to the order of points in a summary paragraph. This could lead to a debate on which type of situations would be included. X's (22) idea is that of looking at the question of order from a different perspective, that of the reader of the summary paragraph. By focusing on the reader, X has turned the tables to consider the task of summary writing from a whole different angle. This is novel and worthy of further discussion. However, the chance to develop the discussion for Item 6a further is aborted by Y's (26) direct polar question, as group members are expected to provide a definitive answer (true or false). The Item is brought to an end by Y's reading of the following task statement.

Similarly in Item 1b, L (37-38) provides the opportunity to widen the scope of the discussion when they introduces a novel idea, that of using a "visualiser". This constitutes a new idea in the discourse and can be considered as an instance of reference to a shared object since the notion of visualising content is included in

the course curriculum. However, despite L's efforts to employ explicit reasoning, there is no uptake on the notion of visualiser.

Sometimes new idea emerges in the process of puzzling the meaning of a Statement. Item 9b, the discussion centres on the understanding of the question itself rather than whether the Statement is true or false. The discussion is mainly about what the phrase "source of meaning" means. Contributions which help explore and build the topic include giving examples and proposing possible interpretations. Z (41-42) contributes an elaborated response to L's confusion with the elliptical "it's about..." as they offers a suggestion of what the meaning of the task statement might be. Z generates a new idea by introducing the notion of details, clarifying that the Task statement refers to the issue of whether students should include source details to justify "some reason" in a summary paragraph. The fact that Z makes an effort to respond to L's confusion demonstrates intersubjectivity and they employ knowledge creation discourse to convey their idea about details.

## **5.8 The link between transactivity and follow-up of ideas**

The findings showed many instances of new idea emergence in the recorded interaction in the present study. However, further examination indicated that new idea was not developed unless there was engagement by different group participants. This raised the question of what engagement actually entails. As can be seen in the findings from the data analysis, the label used throughout the present study, "follow-up", does not specify intersubjective engagement at a meaning-making level. In fact, although they pick up on other speakers, some second pair parts (SPPs) found in the data can be described as superficial, because whilst they follow conversational conventions, they lack in conceptual development. Some Items with several indicators of CKC in the data set are characterised by participant contribution of nuanced points to existing points. This happens in Item 7b In Item 7b, X (8) adds nuance to the discussion by paraphrasing Z's word "opinion" with their word "judgement".

The data findings in the present study support the notion expressed by Scardamalia and Bereiter (2014, p. 9), that knowledge building in educational settings involves not only generating new ideas, but also the further development

of ideas so that growth of existing knowledge may flourish. As seen in chapter 2, some scholars, such as Trausan-Matu et al. (2013), prioritise the emergence of new idea in group knowledge building. A reflection of the findings from the present data analysis, indicate that new idea does not amount to CKC if there is no development of themes. On that basis, I now turn to a consideration of not only whether, but how speakers engage with each other based on the evidence provided in chapter 4.

What has emerged from the data analysis of the present study is that the vital component for CKC is not only follow-up of idea, but the nature of that follow-up. An examination of how ideas develop in group interaction shows that there is an important difference between simply picking up on another speaker (such as in Item 7a) and the act of building on what they have said (such as Item 9a). group interaction contribute to the potential for knowledge building. When interaction is of the building type, it involves aspects which are related to the notion of knowledge creation discourse (van Aalst, 2009), as discussed in chapter 2.

In line with the theory outlined in chapter 2, the findings in the present study show that knowledge creation discourse can widen the potential for CKC in the discussion by adding nuance or alternative to existing points and ideas. In practice, this involves conversational moves such as summarizing or reformulating and these may be produced in response to challenge. As is shown in the data findings such moves often occur when *relationality* and *explicit reasoning* are invoked, as speakers try to make things clearer to others or to relate to them by persuading them of a view. This study has shown that such knowledge creation discourse is employed when speakers are engaging in visible thinking, as they puzzle over a joint problem such as what the meaning of a phrase seen in the Task Statement might be, as happens in Item 9b, when D provides specific examples to elucidate meaning of the phrase “source of the information” (54).

Knowledge creation discourse is also related to *cognitive openness*. This is embodied in the use of conditional tenses to communicate hypothesis. As is found in the data analysis, conditional tenses and structures with “if” are used as a mechanism by speakers to display *cognitive openness*. This practice fosters CKC through idea emergence and development, as it allows speakers to convey their consideration of alternative possibilities in a given situation. In this way, a higher

level of discussion (Weinberger & Fischer, 2006, p.85) may ensue, as the use of the conditional tense allows the contemplation of abstract concepts. For example, in Item 1b, P (53) uses the zero conditional to posit possible ways of understanding the task statement (“if I just understand...?”).

In Item 1a “if” is used by J and reproduced by X- thus it evokes OP and REL but also makes their reasoning more explicit- EXP

Item 5a shows how several new ideas (18), (20-24), (30-31), (33-34), (34-38), weave together intersubjectively. Although it is one of the shorter Items in the data set, Item 5a seems to embody speakers’ engagement with each other’s ideas, and ultimately CKC. Item 7b also shows participants building knowledge collectively. Speakers express their views one by one but maintain a steady focus on the point made by Z (5-7). The effect is a collective build-up of group thesis, especially through the contribution by X (8), and the reference to course material by P (9-10). Thus, despite its short duration of 15 lines, around a quarter of the length of Item 7a, Item 7b embodies a more effective example of collaborative interaction as a synchronous activity that results from a continued attempt to construct the group view over several turns (5-10) by X, Z and P, and corroborated by D (12). This Item demonstrates how the group maintain a shared conception of a problem (Roschelle and Teasley, (1995, p. 70).

The data findings show that there are several contributions of idea in Item 9b; that a summary should not include personal opinions (12), that a summary writer may hold different opinions from that of the original article (32-33), that a summary should include reasons (41-42), that sources of information can be articles or other media Items (54), that a summary should be simplified (73), and that of deixis when D suggests that a summary carries a particular meaning at a particular time (84). Whilst these themes may seem to be unconnected, the fact that they are all linked to the task statement implies that the participants are intersubjectively working together throughout the discussion to add nuance and build their view of whether Statement 9 is true or false.

This section explores the notion of idea development in the group interaction by placing a lens on Items in the data set where there is evidence of development of participants’ points by others, as well as Items where development of idea does

not ensue. Thus, by means of comparison of two pieces of interaction which had the same aim but different outcomes, I hope to gain a nuanced view of the ways in which speakers backchannel on each other, in order to gain insights into the effect of the different ways in which relationality surfaces in the interaction and the effect of this on how the discourse evolves and whether it leads to development of idea and thus, CKC.

Some insights can be gleaned from a comparison of each group's performance in Statement 1. In contrast to Item 1a, where there is limited development of others' points, Item 1b contains more follow-up of idea with the result that the discussion of the Statement is considerably longer for Group b than for group a. Unlike group a, Group b extensively debate the question of how to interpret the language of the task statement. Over the course of the 5-minute discussion, there is abundant uptake of each other's points, whether these are concurrent (65-67), express doubt (61-62) or request support (52-53).

In contrast to Item 2a, Item 2b embodies an extended discussion. This seems to occur due to the introduction of different dimensions to the discussion as participants propose hypotheses about lengths of text in response to the task statement. Item 2b is characterised by a recurring focus on the main Statement throughout the long piece, which includes breaks where students talk about a different Statements.

In the case of Item 3a, X's turn (10-12) constitutes a new idea when they introduce the notion of how to interpret the task statement. They present this question of interpretation as a precursor to their proposal of how the group might evaluate the task statement and its implications for their approach to summarising. X focuses on the lexis of the Statement, in particular the notion of modality embodied by the phrase "can" from the text of the task statement, and equivalencing it to the notion of what course of action is possible, X displays epistemic agency, and brings everyone's attention to the language of the task statement. In this sense, X invokes what Schwarz and Baker (2017, p.161) call the conceptual dimension, defined as encapsulating ways of understanding a discourse. Thus, Item 3a embodies both conceptual factors and intersubjectivity, due to the salient recognition of alternative discourses. Yet, there is no further

engagement with the issue perhaps because of J's (14) clear acceptance of X's position.

In Item 2a, when H (14) contributes the notion of brief sentences, it could be developed by the group but there is no uptake on this idea. In their second turn (17) H admits their lack of knowledge ("I have no idea"). H's overt admission of uncertainty constitutes an invitation for other members to contribute their views (van Heijst et al., 2019, p. 181), but this does not occur as Y (19-20) brings the Item to a close with a practical solution, that they can ask the tutor to confirm the answer.

Item 7a has both new idea and follow-up of idea, however the follow-up by X (42-43) to L's (32-33) point about adding one's opinion before and after a summary is limited to a non-dialogic response in which they do not recognise the existence of alternative views. Whilst X (42-43) picks up on L's lexis "before or after", they do not explain the motives for their disagreement with L. X's (42-43) view is unchanging and by not probing L's idea further, knowledge construction is not invoked. Similarly, conceptual exploration lacks in Item 7a, despite the presence of effective transactivity. By failing to explore L's rationale, X's turn embodies an externalisation (Teasley, 1997) and does not lead to idea development.

A similar lack of depth is discovered in Items 8a and 8b, which are both affected by lack of development of idea. In Item 8a there is evidence of new idea when J (5) introduces the notion of plagiarism into the discourse. Other participants could build on J's turn by contributing a view on plagiarism, yet this is not forthcoming. In conclusion, J provides the mechanism for extending the scope of the discussion, but intersubjectivity lacks on the part of their peers. Other group members do not vocalise any interest or curiosity in J's suggestion. The discussion therefore seems to lack active participation and curiosity, two ingredients which according to Ness et al. (2015, p. 38) are crucial for group knowledge construction.

In Item 8b, the collective argument that the task statement is true is built by D (9-10) and P(11). However, because the assertions of these two participants are not probed or extended by other group members, there is no prolongation of the item. In summary, although the item is categorised as embodying both new idea and follow up when P contributes by making a reference to the content of the

lesson in order to substantiate D's view, there is a lack of explicit reasoning to explore and develop these views.

This study has led to the conclusion that follow-up is not a polar issue, but can range from basic feedback such as in Item 1a (13), or 4a (8) to deep engagement and elaboration of themes raised by others in Items 2b, 9a or 9b. Now I will explore what occurs when others' ideas are developed in depth.

## **5.9 A holistic view of the relevance of transactivity to CKC**

In order to further probe the connection between transactivity and knowledge construction, it is useful to consider Items which display little evidence of transactivity in the data analysis and review the level of CKC detected in those same Items. As can be seen in the findings presented in chapter 4 (see Figure 4-1), the three dimensions of Transactivity are present in the group interaction examined in the present study. The exceptions are Item 2a, 3b, 4a and 6b, which show minimal or no transactivity. Most Items in the data set evidence a combination of the three dimensions but Item 6b only displays relationality, Item 3b lacks explicit reasoning and Item 4a contains no cognitive openness. These four Items are the only ones in the data set apart from Item 6a, which lack follow-up of idea, although new idea is accounted for in all Items in the complete data set, except Item 3b.

In contrast to Item 1a, there is no evidence of transactivity in Item 2a, and ultimately there is no CKC. Whilst there is a contribution of new idea by H in Item 2a (15-17), no rationale is offered for her opinion. H's point about using brief sentences is not taken up by other speakers, so relationality is absent. There is no further engagement on the issue. In Item 2a, there seems to be an absence of what Heritage and Sorjonen (2018, p. 162) term "intersubjective understandings".

The discussion of the findings works on the basis that there is a synthesis between the concepts at the centre of the research questions, as neither the dimensions of transactivity nor the indicators of CKC operate in isolation. All of the factors associated with both transactivity and CKC have an effect on prolongation but are also affected by it. Furthermore, the notion of effective relationality entails

networking with others' spoken output in a space which is filled with multiple views. Only if speakers demonstrate cognitive openness to these explicitly expressed alternative views, may consideration and development take place. The findings support the notion that CKC is dependent on intersubjectivity, which occurs when people in groups work to make sense of situations and of each other (Suthers (2006, p. 321) in the creative space (Wegerif, 2007) where views interconnect to generate new knowledge.

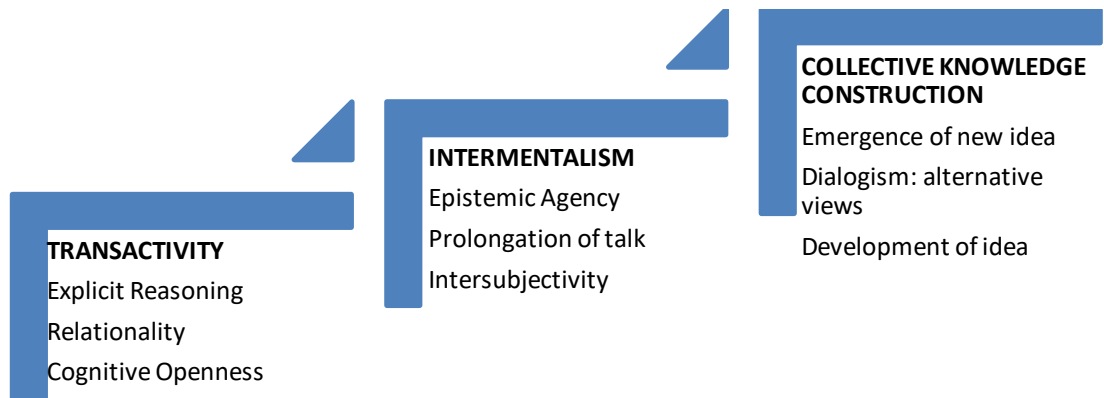


Figure 5-1 From transactivity to intermentalism to collective knowledge construction

## 5.10 Knowledge creation discourse

In Item 9a, S (54), poses an information checking question to operate on Y's turn (51-52). S effectively reformulates Y's turn by using the frame "so that means the..." to build mutual understanding of the issue about referring to the original source. By drawing a parallel between Y's point about the original source, and citations, S employs knowledge creation discourse to convey a new idea ("citation") to the group. Thus, knowledge building is found to occur through collective effort in this Item. The multiple demonstrations of willingness to consider alternative possibilities (27-28) (about citations), (31-34) (about sequencing), (33) (about improvement), (36-39) (about sources already included), (45-48) (about explanations from the article or other information), and (66-69) (about supporting information or citation marks), infers both creative thinking and openness to different possible meanings of concepts among group members. The recurring debate about the essential meaning of Statement 9 by Group b

constitutes collective epistemic agency as the group works collaboratively to establish what the shared problem actually is (Sarmiento-Klapper, 2009, p.83; Roschelle & Teasley, 1995, p. 70).

Similarly, in Item 9b there is evidence of knowledge creation discourse through summarising. Z (58) relates to D's turn (52-57), where they give a definition of what a source of information may be. Z (58) summarises D's definition substantially, suggesting the blanket term "examples and data and quotations" to encompass D's list of particular Items. confirmation of their point, and X (65-69) elaborates further on the theme using an example "corruption" (68).

What is found to be impactful on CKC from the data analysis is the effort groups make in the interaction to construct the JPS (Sarmiento-Klapper, 2009, p. 83), as this involves a higher level of intersubjectivity. The data findings show evidence of positive interdependence (Johnson & Johnson, 1991), when participants expand and deepen the group discussion to try to establish what the task statement means, before they aim to decide whether it is true or false. This occurs in Item 1b, 9a and 9b and embodies metacognitive statements (Webb, 2013, p. 22), whereby a speaker admits lack of certainty and then the group constructs a solution collectively.

In the data findings of the present study, there are instances of speakers tacitly or overtly stating that they have not understood a point made by another speaker. As discussed in chapter 2, a suggestion or declaration of failure to understand may lead to extended interaction as other group members attempt to illuminate the point for Koschmann (2013, p.156). Related to this, Schwartz (1999, p. 8) suggests that misunderstanding is at the source of collaborative learning. Admission of failure to understand, as well as recognition of others' misunderstanding can provide a cue for other speakers to contribute their views (van Heijst et al., 2019, p. 181). These contributions prolong the interaction and may involve reformulation of discourse, as speakers re-word aspects of prior contributions of fellow participants. Such an act of reformulation requires engagement with the substance of other participants' turns, in order to process what the intended meaning may be, before being able to reformulate it. This form of intersubjective meaning-making (Lund et al., 2013, p.24) requires epistemic agency both for the process of interpreting contributions as well as for employing knowledge creation

discourse to reformulate them. Sometimes reformulation leads to the addition of nuance to a theme. This is illustrated in Item 6a, when J (3-7) paraphrases S's turn to reiterate that a writer can change the order of points in a summary paragraph, and J (6-7) adds nuance by proposing emphasis as the purpose for doing so.

The findings show that the act of reformulating a point may embody the combination of the three dimensions of transactivity and that specific linguistic features may contribute to this. *Explicit reasoning* and *relationality* are combined in Item 1a, when X (16) effectively reformulates J's point in the group knowledge building space by using the resultative linking adjunct "so". Similarly, the use of the causal conjunction "cause" in Item 7a, helps J (19-23) combine *relationality* with *explicit reasoning* when they pick up on Y's earlier turn (10-13), in their explanation. In Item 7b, X (8) invokes *relationality* by paraphrasing Z's (5) word "opinion" with the word "judgement".

As seen in claims made in chapter 2, declarations of difficulty of understanding by speakers may invoke the use of knowledge creation discourse by peers as they offer follow-up consisting of attempts to elucidate points. The following examples from the data are used to discuss how knowledge building interaction develops in cases where the group decide to puzzle out the meaning of a statement as happens in Items 1b, 9a and 9b.

As discussed, in Item 1b, P (52) declares that they do not understand the meaning of the text in the task statement. P's contribution (52-56) constitutes an example of dialogism, as they use abundant hedging language to share their thinking that there are various possible ways to interpret the phrase, "fully understanding". This leads to contributions from others as they take up the meta issue of how to interpret the language of the task statement over subsequent turns (57, 78). P seems to engage actively as a listener as they continues to puzzle the issue of what the task statement really means, and comes back to it again (61-62) where they seems to have made up their mind that task statement 1 refers to the main argument in a text.

Since new arguments emerge in P's contribution (52-56), this can be classed as knowledge creation discourse. There is arguably a shift to a higher level of discussion (Weinberger & Fischer, 2006, p.85). A nine-second silence (63) suggests

that participants are in contemplation of the issue raised by P, and this continues participants consistently recur to P's issue of the interpretation of the task statement throughout the Item.

Item 4b demonstrates how knowledge creation discourse can emerge in response to a group member's admission of uncertainty. When L admits being unsure "I don't know if I'm right" (6-7), D (10-11) operates on L's turn, adding rationale about the motivation for using quotations. In contrast, one participant's admission of uncertainty does not lead to follow-up by others in Item 2a. When H (17) explicitly admits their lack of knowledge ("I have no idea"), it could be a cue for other members to contribute their ideas, to help the group effort by overtly reflecting on their quandary or even by making suggestions of possible solutions themselves. However, this does not occur and H's indirect but fairly clear request for cooperation from their co-participants (Bartlett, 2012, p.203 ) is left unaddressed. The absence of response to H suggests that other group members are not engaging intersubjectively, which may imply a lack of listener engagement (Wells, 2007, p.49).

### **5.10.1 Shared objects and the joint problem space**

According to the theory seen in chapter 2, the act of referring to shared objects allows the group to enter the creative space (Wegerif, 2006). In Item 1b, X (26) uses ellipsis in the form of the impersonal pronoun "it" in their reporting of the content of the task statement ("it said"), which embodies a shared object of the group. According to Paavola et al. (2005, p. 23), and Howley et al. (2013b, p. 196), reference to shared objects such as an expert authority (van Heijst et al., 2019, p. 173) can redirect the group focus and this is linked to knowledge creation discourse. The data findings in the present study substantiate the second part of this view; that speakers who refer to shared objects demonstrate agency and resourcefulness to validate their point. As for the first claim about group focus, lack of follow-up of these turns means that there is no evidence of a real change in focus.

The strategy of referring to expert authority recurs throughout the data set. For example, in Item 3a, X (10) uses the phrase "it said" to refer to the task statement as they probes the semantic meaning of the discourse therein. The group do not

follow this reference up. Similarly, in Item 4b, L (7-8) refers to the shared resource of the course work by using the frame “it mentioned”. Despite this reference to the shared object, L’s turn does not encompass explicit reasoning about the benefits of using direct quotations in a summary paragraph, as there is no explanation as to why this is the case. In Item 8b, P (11) consolidates the group consensus by using the elliptical demonstrative pronoun “this is the lesson B”. The positive reactions of D (12) and Z (13) show appreciation of P’s point, but there is no further engagement with it.

These examples indicate that reference to shared objects in the discourse embodies a form of relationality by linking to exogenous Items, and highlighting common ground between group members (Damşa, 2013, p.101), as is discussed in chapter 2. However, the reference to shared objects does not guarantee explicit reasoning, nor does it lead to follow-up, as is the case in Items 3a or 8b.

## **5.11 Conclusions of the Discussion Chapter**

The discussion presented in this chapter has shown that transactivity can both foster the emergence of new idea and facilitate development of idea in group interaction by leading to prolonged and deeper engagement with a topic. Thus, transactivity embodies a mechanism through which intersubjectivity can be rendered salient so that participants become aware of peers’ effort to convey their views and to connect with others. Such reciprocity may foster the incentive to continue applying cognitive effort on a given task. The resultant community dynamic invokes interest and enthusiasm in participants to propose, maintain and develop ideas as part of the collective knowledge building effort. This leads to the deduction that the gamechanger for CKC is not transactivity alone. Rather CKC occurs if transactive interaction is combined with learner agency and active involvement, so that meaningful engagement is fostered (Wertsch, 2002, p. 108). In the present study, the necessary components for effective CKC are found to be the emergence of new idea as suggested by Schwartz (1999, p. 7), and the meaningful follow-up of idea in subsequent turns during the interaction. This leads to the conclusion that whilst transactivity is necessary for CKC to take place,

it does not ensure that CKC will occur in learner interaction. The next section considers why this is the case.

The findings in the data analysis of the present study evidence that relationality, the central ingredient of transactive interaction (Berkowitz & Gibbs, 1983), is often apparent in the interaction and can be accounted for by the use of language, but that intersubjectivity is often limited. For example, direct personal pronouns are used to relate to another participant in Item 3b, (5) “you sure?”, but no development of the point ensues. Similarly, co-participants may relate to each other by voicing agreement through the affirmative response token (Carter & McCarthy, 2006, p.189) “yeah”, which whilst being socially acceptable, does not foster development of the discussion. In other words, in their turn construction units (TCUs), subsequent speakers might not attempt to engage with the thoughts expressed by the initiator of the idea. As a result, there is no deepening or probing of participants’ views.

Reflection on the evidenced transactivity in the data set of the present study suggests that there is an important distinction between a superficial level of relationality and an intersubjective one in learner interaction. The superficial level involves participants offering a vocal response as is expected in the basic conventions of conversation patterns (Sacks et al., 1974), but this response is of a perfunctory nature in that it does not develop a theme. In contrast, the intersubjective level of transactivity invokes knowledge creation discourse, by testing, adding to, or countering another speaker’s idea (Webb, 2013, p. 21). The findings in the present study show that intersubjectivity is not guaranteed in all transactive interaction even if speakers relate to each other the interaction, by picking up on and replicating each other’s lexical use, as they do in Item 5b, for example.

The previous paragraphs have shown some examples of the effect of transactivity on the notion of intersubjectivity, with a view to linking this to CKC. It has also been shown that there are Items such as Item 5b in the data set which include some or all of the dimensions of transactivity, yet which lack deeper engagement with points made by others. Therefore, these Items can be said to have little intersubjective relationality, which implies that the link between transactivity and intersubjectivity and on CKC is not a straightforward one. In essence, the

findings demonstrate that relationality can be superficial; it may appear to comprise effective interaction due to a balance of turn-taking, yet it can fail to result in knowledge building, due to limited probing of other participants' thoughts. Intersubjectivity involves engaging with others' expression of their inner thoughts, and whilst the mechanisms provided by transactivity can facilitate this process, they cannot guarantee it.

Therefore, transactivity does not necessarily invoke intersubjectivity or indeed CKC. Participants may engage in group discussion in a highly transactive but superficial manner, through which thinking is not shared. This chapter has demonstrated this notion by providing examples of sections of talk where knowledge seems to be effectively constructed and by considering them against sections where knowledge building seems to be thwarted. Intersubjectivity is necessary for CKC and this study has shown that transactivity can facilitate intersubjectivity. In this sense, transactivity is a contributing factor to CKC. Without intersubjectivity, groups may achieve working levels of interdependency and this may result in cooperative practice whereby students join up their individual contributions to form a whole (Dillenbourg, 1999), without developing thought collectively as a group.

As seen in chapter 2, studies of collaborative interaction, such as Teasley (1997) stress the significance of transactivity for effective group learning. The findings of the present study indicate that whilst transactivity is a helpful mechanism for group interaction and one which can increase the potential for CKC, it is limited to that because ultimately the development of others' views is the catalyst for knowledge generation in group task-based learning. For this reason, the aspects identified in the theory of dialogism, namely openness to alternative views and active engagement with these, are crucial to knowledge building. Without openness to different views, ideas will not be taken on and developed in the group. Furthermore, findings add support to van Heijst et al.'s (2019, p. 180) view that openness can be detected at different levels. In other words, whilst the conditions for dialogism may be set up through the use of the language of uncertainty, true engagement with alternative views is not guaranteed. As is seen in Figure 4.4, page 162, Item 7a demonstrates plentiful use of hedging structures and other linguistic features related to openness, yet as is discussed in section 5.8, page 176, engagement with alternative views does not ensue in the Item.

By enhancing perspicuity, relating to others and showing openness to their ideas, transactivity is a driver of both intersubjectivity and dialogism. In other words, transactive features in interaction can trigger participants' awareness and curiosity (Ness et al., 2015, p.38) about other views existing in the shared space of their group learning interaction. The resultant dynamic implies that participants will be more likely to connect to each other through the dialogue, with a significant effect on group knowledge construction. Thus, a generative cycle of CKC may be established.

Examination and reflection of the data set from the present study shows that transactivity is beneficial to the flow and prolongation of task-based learner discussion and helps to encourage central aspects of collaborative learning such as interdependency and joint problem-solving. However, only if transactivity facilitates intersubjectivity, will it affect CKC in the sense of deeper learning and lead to growth of understanding in the group shared space. Intersubjectivity is contingent on epistemic agency, whereby group participants invoke effort to contribute new ideas and build upon others' points, having previously allowed these points into the shared space of community dialogue. The most energised and prolonged items in the data set are the ones in which such engagement ensues over the development of the discussion such as items 1b, 2b, 5a, 9a and 9b.

## **Chapter 6 Conclusions and Implications**

The present study evolved from the initial aim of gaining insights into the spoken interaction produced among small groups of students and how transactive speaking may enhance the opportunity for collective knowledge construction among learners. Before embarking on the study, I wished to know what factors affect the potential for effective collaboration when students work autonomously in small groups to complete course tasks without instructor supervision. In chapter 1, I used examples from the learning sciences to highlight the dominant view that collaborative learning is central to contemporary education and that collaborative interaction can foster the construction of knowledge. I acknowledged van Heijst et al.'s (2019, p. 182) claim that practitioners in education should be informed about what effective collaborative interaction entails, in order to influence the conditions in which such practice takes place. On that basis, having gained insights

into the effects and limitations of transactivity in learner interaction, the present study concludes by considering the implications for classroom practice and making some suggestions about good practice in small group task-based interaction. Despite the dominance of the communicative method of learning in the present day, students in higher education settings are often relatively inexperienced in small group work, especially if they have been schooled in cultures where large class sizes are the norm and there is little opportunity for autonomous student-centered work.

As I progressed on the current project, it gradually became clear that it was important to move away from the realms of description of what collaborative interaction may encompass, to consider the underlying issue postulated by Schwartz (1999, p. 24), of how collaboration emerges. To do this, the present study uses recorded talk to reveal insights into how CKC develops over a group discussion. As stated in chapter 1, the present study is not concerned with specific outcomes of learner performance or whether a given task answer is correct. Rather, I wished to explore the unfolding link between participants' interaction and the emergence of knowledge. Damşa (2014, p. 248) laments that few studies have addressed the details of group interaction that lead to students sustaining collaborative efforts over longer time frames.

The present study has raised the question of how to make collaborative task work more effective for students, vis-à-vis spoken interaction. Thus, it responds to the need identified by Haneda and Wells (2013), for educators to provide opportunities for students to formulate their thinking and extend their understanding through speaking. The notion that unstructured collaboration does not guarantee that learning will occur (Jeong, 2013, p.176; Curşeu & Pluut, 2013; Tegos et al., 2015), has important implications for the preparation of students, before they embark on autonomous group learning.

## **6.1 Implications for practice in higher education settings**

Given the onus placed on autonomous learning and critical thinking in contemporary higher education settings, the skill of engaging in peer-based discussion is linked to contemporary graduate attributes (Basturkmen, 2016). If instructors are offered the chance to recognise signs of more or less explicit

utterances by students when monitoring task-based group work, they may be able to make modifications to group dynamics and integrate pedagogical and technological supports to foster group cognition by empowering collective agency, equal participation, and ownership of learning (Borge & Rosé, 2021).

Stahl and Rosé (2011, p. 521) highlight the longer term impact for students, when they move on to encounter group problem-solving scenarios in their subsequent academic and professional lives. This long term view of collaborative work implies the need for versatile and effective relational skills (Basturkmen, 2002; Ness et al., 2017). It could also be argued that in such conditions, skill, if not knowledge, will be enhanced simply by taking part in small group task-based learning (TBL) activity (Willis, 1996) if students foster a productive rather than a passive approach to learning (Damşa, 2014, p. 247).

As stated by Rummel & Spada (2005, p.235), task-based learning can present a high level of challenge to groups, resulting in failure to complete given tasks. To guarantee efficiency, supportive environments must be nurtured (de Backer et al, 2017). Nguyen (2022) emphasises that effective learning environments should foster transactivity and Basturkmen (2016) proposes the encouragement of the practice of extended reasoning conversations for L2 learners such as the ones in the present study. As discussed in chapter 5, for L2 students working in higher education settings the present study indicates that training and encouragement to adopt transactive speaking styles in group work is beneficial despite limitations due to lack of linguistic precision (see chapter 3, section 3.4.3). If L2 speakers use transactivity when engaged in group work, they will not only express themselves in group work with more impact, but will contribute to the potential for collective knowledge construction in the group.

## **6.2 Awareness-raising and learner autonomy**

As stated by Tegos et al. (2015) the reality of both online and some face-to-face educational settings is that due to group sizes and technical constraints, instructors are unable to monitor individual groups all the time. This premise justifies training students in collaborative speaking skills so that they may take more charge of the experience and determine how successful it may be. The present study concludes that transactivity can be reduced to three main

dimensions, and that if converted into a rubric, this may have the potential to constitute tangible guidelines for students to follow in an accessible way, even if they are working without instructor supervision.

The present study has shown that active participation and prolongation of interaction are crucial for knowledge building. Whilst nobody can be forced to speak, and students should have the space and the right to say nothing (LeCourt, 1999, p. 154), instructors may improve student input in group work by providing their students with clear expectations about participation. Such guidance should be recurrent and subject to student input, especially since instructors are not always present and available to closely monitor group interaction. The present study does not try to assess why or why not participants follow-up peers' ideas on some occasions. As stated in chapter 1, psychological and emotional dimensions are not central to the present study. The approach was rather to look at what actually happens when group work is underway, with a view to suggesting pragmatic measures to encourage learners to commit themselves to the group learning agenda via thoughtful interaction. Based on the findings of the present study, awareness-raising and training in transactive spoken interaction should be provided in educational settings to increase the potential for learners to heighten the collaborative learning opportunity embodied in group work.

As well as having a higher control of transactivity, contribution to interaction should be established as a valuable asset, which all students can aspire to achieve. As Fiacco and Rosé (2018, p. 183) highlight, instructors should aim to imbue in their students the notion that contribution itself is a valuable motive for participation in the learning environment. For example, reflection tasks about the importance of participation, as well as about their own levels of effort, may increase the prominence of epistemic agency (Stahl, 2006, p. 10). It should be impressed on students that it is not expected that knowledge will be brought to the task-based group forum by individuals. What they can contribute are the skills and resources which they have already developed in their previous educational settings (Stahl, 2006, p. 10). In this way, they can develop and strengthen relational skills (Ness & Riese, 2017) as well as construct their collective knowledge about skills and strategies pertinent to academic study. In practical terms, tasks and knowledge areas should be selected on the basis of relevance to students, and goal orientation should be clear, so that participants are more likely

to make more effort in group tasks (Wise et al. 2013). As well as this, tasks chosen for learning must allow for prolongation and depth of topic expansion through engagement with alternative views and solutions (Schwarz & Baker, 2017, p. 168).

As students progress in their studies, speaking becomes increasingly important. For example, postgraduate programmes tend to involve more seminars and discussion-based classes than undergraduate programs. In the case of L2 learners such as the ones in the present study, preparation for speaking events is an important aspect of their learning pathway. EAP course providers may find insights from studies such as the present one to inform them of descriptions of speaking in the types of learning events that students need to participate in (Basturkmen, 2003, p.22). Further to this, as well as using materials for speaking that reflect formulaic patterns of language (Basturkmen, 2002), such as language to ask for clarification or other set structures, materials designed to foster transactivity may meet the needs of the more spontaneous nature of task-based interaction. Such materials could emphasise the practice of how to introduce new ideas and pursue idea development in interaction.

Some practices which foster transactivity are already omnipresent in EAP settings. For example, explicit reasoning is encouraged with the constant need to integrate relevant sources in students' productive skills work (Hyland, 2012). More particularly, in the EAP classroom, the use of language crib sheets based on the linguistic features found to foster transactivity in the present study may have value as a support mechanism for L2 students as they prepare to engage in group work. These would add to existing frameworks and tasks designed to increase the use of specific language features such as cohesive devices, which are considered to be key facilitators of the provision of examples, explanation and justification of views or theory in spoken and written interaction (Jordan, 1997, p. 199). Since student participation benefits from subtle teacher feedback (Dennen, 2005), this could entail instructors keeping a record of student group interaction. The increasingly accepted practice in contemporary student-centred learning implies that if the right frameworks are provided, students may be able to take charge of their own monitoring. In this way, students may report their experiences back to the instructor in a template form, and the instructor could provide follow-up by meeting the group once a week for example. Students could record their own

dialogues making use of the mobile devices then produce diagrams as a type of ratings chart (Sinha et al., 2015) as a weekly task.

### 6.3 Practical Proposals

For Mercer et al. (2019) pedagogy is more important than technology. They recommend that all participants vocalise views during the task. They also advocate that the activity should be designed to encourage co-operation rather than competition between partners. Furthermore, students should have a solid, shared understanding of the point and purpose of the activity as well as some meta-awareness of how talk can be used for sharing ideas and solving problems.

Bernstein and Isaac (2018, p. 2) recommend the use of rubrics to enhance critical thinking in online discussions, claiming that these can result in higher-order thinking. Littleton and Mercer's (2013, p. 16) rubric has 6 tenets and is resonant of Resnick et al.'s (2010) accountable talk model; there should be critical and constructive engagement with others' ideas; relevance of information (as recommended by Grice, 1989), respect for others' ideas; reciprocal questioning and response with rationale; the aim for consensus on issues and on logistics, and reasoning should be explicit.

The study has shown that openness is a key factor in group dynamics not only because it enhances social positivity by showing willingness to work together (van Heijst et al., 2019, p. 168) but also because it leads to the inclusion of a wider range of themes when participants accept and engage with ideas of their peers so that group members feel free to bring in different perspectives (Cacciamani et al. 2012). As a synchronous activity, speaking can be demanding in learning settings, especially if speakers are using a second language. For this reason, if a rubric is to be offered to students, it should be a simple one which they can get used to quickly and remember easily. Therefore, I propose that a three-part rubric consisting of explaining one's rationale, asking others the reasons for their views, and thinking openly to allow alternative ideas to be fully considered and debated, would provide a useful tool for students in different areas and stages of education where the objective is to increase communicative oral skills. For the purposes of student accessibility and ease, I would simplify the terms used in the present study to produce a student-facing model. The model would combine the essential

dimensions of transactivity with the need to contribute and develop ideas. This proposed rubric would be labelled EFI which stands for explicitness, follow-up and idea.

As O'Donnell and Hmelo-Silver explain (2013, p. 3), there are different views on the merits of strategies adopted within a social-motivational approach to group learning. Although Hinkelman (2018) recommends it for second language classrooms, gamification is not promoted by everyone working within EAP. There could be a flexible attitude to this, which instructors can vary according to the student response in a given setting on a given day. Some tasks, such as the one conducted for the data collection procedure at the centre of the present study, are presented in a quiz format. In the present study, this did result in extended group discussion, in abundant transactive dialogue and even in CKC. This option is supported by Baker's (1999, p. 179) findings that whilst interactive pressure does not lead group peers to resolve verbal conflicts, it does lead them to draw on different types of knowledge, to determine and differentiate concepts, to negotiate meaning, and to combine elements of solutions.

However, there are some task items in the data set, such as Item 6a, where participants quickly concluded the discussion, and this scenario may justify some modification of the initial instruction. For example, students could be requested to talk for a minimum of 3 minutes on each statement, or to think of and share as many reasons to support the task statement as possible. Alternatively, there could be ground rules that everyone must speak, or everyone must pick up on another person at least once. A template could be provided for students to record their own instances of using transactivity, which if broken down into the three dimensions, may prove easier for students to recognise. This could be used for self-reflection purposes or for peer feedback to complete with instances of challenge, change of view, or justification of rationale so that performance can be followed up by the instructor, not for levels of correctness, but for levels of participation. In this way the onus would be on the students to decide whether to participate. At the start of each week, students could even be given the chance to determine whether they wish to engage or not. If they do not, they could work alone and may be encouraged to join in future group activities.

## **6.4 Limitations of the present study and future directions**

The present study would have been conducted in a different way had it not been for the enduring world pandemic. The event of the pandemic in early 2020 resulted in an abrupt shift from face-to-face to online EAP delivery at universities across the world. In summer 2021, the fact that pre-sessional EAP courses at UK universities were still being delivered in an online format meant that the data collection was conducted in a virtual class setting instead of a face-to-face one. Despite the adaptation to the circumstances implied by external factors, the emphasis in the present study is on synchronous spoken interaction between peers whether face-to-face or meeting online.

That said, the question of the potential impact of the online environment on the findings is one which would be valuable in a comparative study of transactive interaction in online and face-to-face groups. I posit that such future research could investigate how learning outcomes and learner satisfaction may be affected by differences between interactional patterns in online learning settings from face-to-face ones. This could have implications for course planning and teacher training, as such a study could be used to make recommendations about what type of format is best suited to different types of learner, what type of lessons or activities may be best delivered in an online capacity on hybrid programmes, or for teacher-training purposes on how to maximise opportunities for learning in the different modes of delivery. Suthers et al. (2013) claim that teachers need to be informed about how to transform less exceptional but more typical situations into learning opportunities. Such qualities may be more fully exploited if, through effective spoken interaction, students adopt an approach of development and depth of topic rather than aiming to complete the tasks in as short a time as possible.

Such an investigation may involve a parallel study of online and face-to-face settings with similar characteristics in terms of the task dynamics, such as the number of participants in the groups. Therefore, common factors such as learning objectives or materials may be established, to allow a comparative analysis of levels of transactivity in group interaction. A study such as the present one could be conducted collaboratively between researcher-practitioners at partner universities and even across different languages.

On the question of reliability, the present study began by stating the ethos of learning as a process and by using this premise to justify the avoidance of before and after testing of knowledge construction. However, this approach could be challenged for reliability and impact. For example, Mercer (2013) stresses the importance of examining both process and outcomes in order to draw more useful conclusions about classroom interaction, proffering the idea that learning must be visible. All the while it is recognized that the focus on the process of peer learning through spoken communication together with the onus on the group as the unit of interaction implies limitations with regard to proof of concrete knowledge construction in terms of individual outcomes (Mercer, 2013). In order to respond to such concerns, I suggest that the practical proposals outlined in the previous section may foster student involvement in monitoring their own levels of effective collaborative work. If student groups have the commitment to regularly engage in joint reflection on their group interaction, using the simple markers established and laid out in a template designed to highlight transactivity, this approach may become an accepted part of the learning experience and even fortify the status of group talk as an alternative discourse genre (Wertsch 1991, p. 86).

As discussed in chapter 5, section 5.2, there are implications for task design if students are to work autonomously on TBL and other group work. The task should have clear instructions so that students can focus on meaning instead of on logistics. The present study used a true or false task for data collection, a decision which aligned with the aims outlined through the research questions presented in chapter 2. The selection of the task in this project seemed to work well for getting the students engaged in discussion, perhaps due to the clear target of deciding true or false. Further work on the use and effect of different types of task may aim to determine which tasks are most conducive to invoking effective collaborative interaction through the emergence of conceptual discussions, during which groups exchange, share, and co-construct knowledge. In future work it would be rewarding to investigate the effect of transactivity in interaction which takes place in other types of learning events pertinent to higher education settings, especially seminar discussion events which are central to many courses in contemporary degree programme settings.

Another interesting and worthwhile follow-up project to the present study would involve a focus on different types of tasks which are used in a range of subject

field areas such as Engineering, Business or Humanities in contemporary education across a range of stages. With a focus on spoken interaction in group work, such a project could respond to the issue many educationalists are currently exploring about the effects of generative artificial intelligence (AI) on learning. Research questions may ask how learners' spoken output reflects the transactive structures they have encountered in their use of AI sources.

## **6.5 Final Conclusions and going forward**

The present study aspires to contribute to the extensive and influential scholarship conducted in the field of the learning sciences by focusing on action-based classroom practice (van Lier, 2007), with the aim of enabling and encouraging highly participative student-centred learning environments. The present study also addresses the request made by Paulus and Wise (2019) for practitioners to contribute to scholarship in the field by raising the profile of group discussion in task-based learning. The findings of the present study may be used by instructors to help them guide students to engage in fulfilling and productive styles of collaborative learning (de Backer et al., 2017) which they can add to their academic skill set.

It is also intended that the present study be shared among the wider learning sciences community, as the findings about the significance of follow-up in learner interaction are congruent with ongoing scholarship in CSCL and CL. This adaptability is justified by the nature of existing published studies in the learning sciences, in which the field subject area and educative stage of participants is usually of less importance than the way in which collaboration takes place, as is evidenced by key work such as Jeong (2006), Stahl (2009), or Zoethout et al. (2017).

More widely, demographic unpredictability and increasing fluctuations in numbers and profiles of students, due to global economics as well as environmental factors implies a need for higher education pedagogy to incorporate flexibility and inclusivity. Effective collaborative peer-to-peer talk may offer a means of responding to this need. For example, with the increase in diversity of refugee EAP students at UK universities (McKenna et al., 2025) the emphasis on spoken interaction may contribute to solutions being implemented to counteract the lack


of experience of formal written work in some student cohorts. As Sohmer et al. (2009, p. 105) highlight, by its association with the collective construction of knowledge, peer talk may support rigorous academic learning in ethnolinguistically and socio-economically diverse classrooms.

Finally, due to its focus on synchronous learner interaction, the present study embodies scholarship which highlights speaking as a key mode of communication in higher education settings (Basturkmen, 2016). This is even more timely in the current digital age where AI-related issues of scholarly integrity (Rodrigues et al., 2025), human connection (Javed, 2024, p. 249) and attention maintenance (Hari, 2022) are increasing the stakes of spontaneous interaction as a means of ensuring authentic human engagement.

# Appendices

## Appendix 1

*Ethics approval documents (interim and final), application number 100200117*

 <p style="text-align: right;">College of Arts Research Ethics</p> <p style="text-align: right;">12 May 2021</p> <p>Dear Janine,</p> <p style="text-align: center;"><b>Application 100200117: interim approval</b></p> <p>With apologies for the delay in processing your application, I am writing to provide interim approval of your project based on the report received so far (comments below). As you will see, the view is that the application materials are in excellent order. I am still waiting on comments from a second reviewer and will pass on any further actionable points as part of the final approval confirmation issued via the system. Feel free to get in touch if you have any questions.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="background-color: #f2f2f2;"> <p><b>4) Checklist</b></p> <ul style="list-style-type: none"> <li>• Are all potential issues identified in the checklist? If not, please comment below.</li> </ul> <p>Yes, they are.</p> </td> </tr> <tr> <td style="background-color: #f2f2f2;"> <p><b>5) Risks and Mitigation</b></p> </td> </tr> </table>	<p><b>4) Checklist</b></p> <ul style="list-style-type: none"> <li>• Are all potential issues identified in the checklist? If not, please comment below.</li> </ul> <p>Yes, they are.</p>	<p><b>5) Risks and Mitigation</b></p>	<p>Cc: Tom Bartlett; +1 other</p> <p>Hi Angela,</p> <p>We've heard back from the reviewer and it looks as if there has been a technical issue blocking the upload of the remaining review. Jen is going to get in touch with IT to see if it can be resolved. In the meantime, the text of the review is included below and the application is formally approved on that basis as of now. We'll get it sorted on the system as soon as we can.</p> <p>This was a well-thought out and thorough application with very clear consideration of the ethics involved in working with own students. What was well-explained also was that the research methods were in the normal scope of class activities for which consent to record was already given. I am happy to advise approval of the project.</p> <p>Best,</p>
<p><b>4) Checklist</b></p> <ul style="list-style-type: none"> <li>• Are all potential issues identified in the checklist? If not, please comment below.</li> </ul> <p>Yes, they are.</p>			
<p><b>5) Risks and Mitigation</b></p>			



College of Arts  
Research Ethics

8 November 2021

Dear Janine,

**Application 100200117: final approval**

With apologies for the regrettably very considerable delay in processing your application, I have finally received the second report and the project approval is finally fully confirmed. Feel free to get in touch if you have any further questions.

Reviewer 1

<p><b>4) Checklist</b></p> <ul style="list-style-type: none"> <li>• Are all potential issues identified in the checklist? If not, please comment below.</li> </ul>
<p>Yes, they are.</p>
<p><b>5) Risks and Mitigation</b></p> <ul style="list-style-type: none"> <li>• Is the commentary regarding risks and mitigation sufficient in coverage and quality? (N.B. feel free to treat all this question as 'open' – i.e. 'To what extent...')</li> <li>• Are all checklist issues addressed?</li> <li>• Are there any issues of researcher/ participant safety requiring further attention/</li> </ul>

Participant Information FAQ: Plain Language Statement	
<b>Study title and Researcher Details</b>	
	<p>Title: <i>A study into how EAP students may enhance their learning of key academic terms by invoking productive agency in a synchronous online environment.</i></p> <p>Researcher: Janine McNair, xxxxxxxx</p>
<b>Invitation paragraph</b>	
	<p><i>You are being invited to take part in a research study. Before you decide if you wish to take part, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.</i></p>
<b>What is the purpose of the study?</b>	
	<p>The research will investigate how EAP students learn academic concepts in an online environment.</p>
<b>Why have I been chosen?</b>	
	<p>All participants in my pre-sessional groups at the University of Glasgow (English for Academic Study) have been asked if they would take part in the research and all volunteers have been contacted.</p>
<b>Do I have to take part?</b>	
	<p>It is up to you to decide whether or not to take part. If you decide to take part, you are still free to withdraw, without giving a reason, at any time until ten days after the data has been collected.</p>
<b>What will happen to me if I take part?</b>	
	<p>Spoken interaction involving you may be recorded and used as data in this project. The data will be collected during the University of Glasgow pre-sessional English for Academic Study course, which takes place from May to August 2021.</p>
<b>Will my taking part in this study be kept confidential?</b>	
	<p>Please note that assurances on confidentiality will be strictly adhered to unless evidence of wrongdoing or potential harm is uncovered. In such cases the University may be obliged to contact relevant statutory bodies/agencies.</p> <p>All identifying information which is collected about you during the course of the research will be kept strictly confidential.</p>
<b>What will happen to the project data and the results of the research study?</b>	
	<p>Anonymised results will primarily be used for the purposes of the postgraduate research project described above but may also be used for further academic research, including publications.</p> <p>The data will be transcribed and anonymised and will be stored in password-protected and/or encrypted files.</p> <p>The data will be retained for a maximum of ten years.</p> <p>Published results will be available from the named researchers.</p> <p>Anonymous participants will not be identified in any report/publication.</p>
<b>Who is organising and funding the research? (If relevant)</b>	
	<p>Not applicable</p>

<b>Who has reviewed the study?</b>
The study has been reviewed by my supervisory team and has been reviewed and approved by the College Research Ethics Committee.
<b>How do I access information relating to me or complain if I suspect information has been misused/ used for purposes other than I agreed to?</b>
<p>You should contact the researcher or their supervisor in the first instance if you have any concerns. Alternatively, if you are not comfortable doing this, if you have tried but don't get a response or if the person in question appears to have left the University, you can contact the College of Arts Ethics Officer (email: arts-ethics@glasgow.ac.uk).</p> <p>Where there appear to have been problems, you are free to - and indeed may be advised to - submit an 'access request' or an objection to the use of data. As part of the University's legal obligations under UK General Data Protection Regulation (UK GDPR), participants retain the rights to access and objection regarding the use of data relating to them.</p> <ol style="list-style-type: none"> <li>1. Access requests and objections can be submitted via the UofG online proforma accessible at: <a href="https://www.gla.ac.uk/myglasgow/dpfoioffice/gdpr/gdprrequests/#">https://www.gla.ac.uk/myglasgow/dpfoioffice/gdpr/gdprrequests/#</a>. Right of objection applies where participants have reason to believe data has been misused or used for purposes other than those stated.</li> <li>2. Access requests and objection are formal procedures not because we mean to intimidate participants into not raising issues, but rather it reflects the fact the University is legally required to respond to requests and address concerns. The system provides a clear point of contact, appropriate support and a clear set of responsibilities.</li> <li>3. Anyone submitting a request needs to provide proof of their identity. Again, this is not intended to deter legitimate queries, but rather reflects the University's duty to guard against fraudulent approaches that might result in data breaches.</li> </ol>
<b>Contact for further Information:</b> Janine McNair (researcher), Dr Angela Gayton (research supervisor)
<b>Janine McNair-</b> xxxxxxxx@student.gla.ac.uk, Dr Angela Gayton- Angela.Gayton@glasgow.ac.uk
<b>If you have any concerns regarding the conduct of this research project, you can contact the College of Arts Ethics Officer (email: arts-ethics@glasgow.ac.uk).</b>

### CONSENT TO PARTICIPATE AGREEMENT TO THE USE OF DATA

A study into how EAP students may enhance their learning of key academic terms by invoking productive agency in a synchronous online environment.

I understand that Janine McNair is collecting data in the form of recorded speech for use in a postgraduate research project at the University of Glasgow.

The research will investigate how EAP students learn academic concepts in an online environment.

The anonymised results may also be used as data for academic research publications.

I have read the information sheet outlining the project and its methods and had the opportunity to ask any questions arising from that.

I consent to participate in the recorded speech activity on the following terms:

1. I can leave the activity at any point.
2. I can withdraw my consent at any point up until 10 days after the data has been collected.

I agree to the processing of data for this project on the following terms:

1. Use and storage of research data in the University of Glasgow reflects the institution's educational/research mission and its legal responsibilities in relation to both information security and scrutiny of researcher conduct.
  - a. As part of this, under UK General Data Protection Regulation [UK GDPR]), I understand and agree that the 'lawful basis' for the processing of personal data is that the project constitutes 'a task in the public interest', and that any processing of special category data is 'necessary for archiving purposes in the public interest, or scientific and historical research'.
  - b. I understand that I have the right to access data relating to me or that I have provided and to object where I have reason to believe it has been misused or used for purposes other than those stated.
2. Project materials in both physical and electronic form will be treated as confidential and kept in secure storage (locked physical storage; appropriately encrypted, password-protected devices and University user accounts) at all times.
3. Any collected data will be deleted after a maximum period of ten years.
4. All names and other material likely to identify individuals will be redacted or removed from published and stored data.
5. I understand that once the collected data is anonymised, in accordance with GDPR legislation, it may be used for the purposes of the project without further reference back to me. However, I understand that I may request access or raise an objection if I have legitimate grounds for concern that I remain directly identifiable from it or that it has been used for purposes other than those stated.

**TICK AS APPROPRIATE:**

- I consent to take part in the above study.
- I agree to the terms for data processing outlined above.
- I confirm I have been given information on how to exercise my rights of access and objection.

Name of Participant: \_\_\_\_\_ Date: \_\_\_\_\_

Signature: \_\_\_\_\_

**Researcher's name and email contact:** Janine McNair, xxxxxxxx@student.gla.ac.uk

**Supervisor's name and email contact:** Dr Angela Gayton, Angela.Gayton@glasgow.ac.uk

**Department address:** English Language and Linguistics, University of Glasgow, 12  
University Gardens, G12 8QH

## Appendix 2

*Script used to present information about recording to participants as part of ethics procedure.*

### SCRIPT

*As I told you on Day 1, I am studying linguistics and education.*

*As part of that I am doing a project about students' communication in the online lesson.*

*It is necessary for me to collect data as part of this project.  
I would like to offer you the opportunity to participate in this data collection.*

*This would involve you:*

*Allowing me to record and analyse your group discussion.*

- *In order for this to proceed you should consider whether you want to be part of the project.*
- *It is each individual's decision whether they participate or not.*
- *Participation is anonymous and does not affect your course work or grades in any way.*

## References

- Allan, K. (2010). *The English language and linguistics companion*. Palgrave Macmillan.
- Atkinson, J. M., & Heritage, J. (1984). *Structures of social action*. Cambridge University Press. doi.org/10.1017/CBO9780511665868
- Austin, J. L. (1962). *How to do things with words*. Harvard University Press.
- Azmitia, M., & Montgomery, R. (1993). *Friendship, transactive dialogues, and the development of scientific reasoning*. *Social Development*, 2, 202–221.
- Baker, M. J. (1999). Argumentation and constructive interaction. In P. Coirier & J. Andriessen (Eds.), *Foundations of argumentative text processing* (pp. 179–202). University of Amsterdam Press.
- Baker, M. J. (2015). The integration of pragma-dialectics and collaborative learning research: dialogue, externalisation and collective thinking. In van Eemeren, F. H. and Garssen, B. (Eds.), *Scrutinizing Argumentation in Practice* (pp. 175–99). John Benjamins.
- Bakhtin, M. (1981). Discourse in the novel (M. Holquist & C. Emerson, Trans.). In M. Holquist (Ed.), *The dialogic imagination* (pp. 259–422). University of Texas Press.
- Bakhtin, M. M. (1984). *Problems of Dostoevsky's poetics*. University of Minnesota Press.
- Bartlett, T. (2012). *Hybrid voices and collaborative change: Contextualising positive discourse analysis*. Routledge. doi.org/10.4324/9780203109373
- Basturkmen, H. (2002). Negotiating meaning in seminar type discussion and EAP. *English for Specific Purposes*, 21(3): 233–42.
- Basturkmen, H. (2003). So what happens when the tutor walks in? some observations on interaction in a university discussion group with and without the tutor. *Journal of English for Academic Purposes*, 2(1), 21–33. https://doi.org/10.1016/S1475-1585(02)00034-6
- Basturkmen, H. (2016). Dialogic interaction. In K. Hyland, (Ed.) *The Routledge Handbook of English for Academic Purposes* (1st ed.) (pp. 152–164). Routledge. doi-org.ezproxy2.lib.gla.ac.uk/10.4324/9781315657455
- Bereiter, C. (2002). *Education and Mind in the Knowledge Age* (1st ed.). Routledge. doi.org/10.4324/9781410612182
- Bernstein, A. G., & Isaac, C. (2018) Critical Thinking Criteria for Evaluating Online Discussion. *International Journal for the Scholarship of Teaching and Learning*, 12(2). doi.org/10.20429/ijsofl.2018.12021
- Berkowitz, M. W., & Gibbs, J. C. (1983). Measuring the development of features of moral discussion. *Merrill-Palmer Quarterly*, 29, 399–410.
- Borge M., & Rosé, C. (2021). Quantitative Approaches to Language in CSCL. In U. Cress, C. Rosé, A. F. Wise, J. Oshima (Eds.), *International Handbook of Computer-Supported Collaborative Learning*. (pp. 585–604). Springer. doi.org/10.1007/978-3-030-65291-3\_32
- Bossert, S. T. (1988). Cooperative activities in the classroom. *Review of Research in Education*, 15(1), 225–250. doi.org/10.3102/0091732X015001225
- Brown, N. J. S. (2015) Feedback-Relevant Places, Interpreting Shifts in Explanatory Narratives. In diSessa A. A., Levin M. & Brown N. J. S.(Eds.), *Knowledge and interaction: A synthetic agenda for the learning sciences*. pp. 403–423. Routledge. doi.org/10.4324/9781315757360
- Cacciamani, S., Cesareni, D., Martini, F., Ferrini, T., & Fujita, N. (2012). Influence of participation, facilitator styles, and metacognitive reflection on knowledge building in online university courses. *Computers and Education*, 58, 874–884.
- Carter, R., & McCarthy, M. (2006). *Cambridge grammar of English: A comprehensive guide : Spoken and written English grammar and usage*. Cambridge University Press.
- Chi, M. T. (2009). Active-constructive-interactive: a conceptual framework for differentiating learning activities. *Topics in Cognitive Science*, 1(1), 73–105.
- Chi, M. T. H., Hutchinson, J., & Robin, A. F. (1989). How inferences about novel domain-related concepts can be constrained by structured knowledge. *Merrill-Palmer Quarterly*. 35, 27–62.

- Chinn, C. A., Buckland, L. A., & Samarapungavan, A. (2011). Expanding the dimensions of epistemic cognition: Arguments from philosophy and psychology. *Educational Psychologist*, 46(3), 141–167.
- Cohen, L., Manion, L., & Morrison, K. (2017). *Research methods in education*. ProQuest Ebook Central <https://ebookcentral.proquest.com>
- Couper-Kuhlen, E. and Selting, M. (1996). *Prosody in conversation: Interactional studies (Vol. 12)*. Cambridge University Press. doi.org/10.1017/CBO9780511597862
- Cress, U., & Kimmerle, J. (2008). A systemic and cognitive view on collaborative knowledge building with wikis. *International Journal of Computer-Supported Collaborative Learning*, 3, 105–122.
- Cress, U., & Kimmerle, J. (2018). Collective knowledge construction. In F. Fischer, C. E. Hmelo-Silver, S. R. Goldman, & P. Reimann (Eds.), *International handbook of the learning sciences* (pp. 137–146). Routledge.
- Crook, C. (2000). Motivation and the Ecology of Collaborative Learning. In R. Joiner, K. Littleton, D. Faulkner, & D. Miell, (Eds.), *Rethinking Collaborative Learning* (pp. 161-178), Free Assoc. Books.
- Curşeu, P. L., & Pluut, H. (2013). Student groups as learning entities: The effect of group diversity and teamwork quality on groups' cognitive complexity. *Studies in Higher Education*, 38(1), 87-103. doi.org/10.1080/03075079.2011.565122
- Damşa, C. I., Kirschner, P. A., Andriessen, J. E. B., Erkens, G., & Sins, P. H. M. (2010). Shared epistemic agency: An empirical study of an emergent concept. *Journal of the Learning Sciences*, 19, 143–186. doi:10.1080/10508401003708381
- Damşa, C. I., Ludvigsen, S., & Andriessen, J. (2013). Knowledge co-construction— Epistemic consensus or relational assent? In M. J. Baker, J. Andriessen, & S. Järvelä (Eds.), *Affective learning together: Social and emotional dimensions of collaborative learning* (pp. 97-119). Routledge.
- Damşa, C. I. (2014). The multi-layered nature of small-group learning: Productive interactions in object-oriented collaboration. *International Journal of Computer-Supported Collaborative Learning*, 9(3), 247-281. doi.org/10.1007/s11412-014-9193-8
- De Backer, L., Van Keer, H. & Valcke, M. (2017). Is collaborative learners' adoption of metacognitive regulation related to students' content processing strategies and the level of transactivity in their peer discussions? *European Journal of Psychology of Education* 32, 617–642. doi.org/10.1007/s10212-016-0323-8
- Dennen, V. P. (2005). From message posting to learning dialogues: Factors affecting learner participation in asynchronous discussion. *Distance Education*, 26, 127–148. doi.org/10.1080/01587910500081376
- Dewey, J., & Bentley, A. F. (1949). *Knowing and the known*. Beacon Press.
- Dillenbourg, P., Baker, M., Blaye, A., & O'Malley, C. (1996). The evolution of research on collaborative learning. In P. Reimann & H. Spada (Eds.), *Learning in humans and machines: Towards an interdisciplinary learning science* (pp. 189–211). Elsevier.
- Dillenbourg, P. (1999). *Collaborative Learning: Cognitive and Computational Approaches*. In P. Dillenbourg (Ed.) (1999). *Collaborative learning: Cognitive and computational approaches* (pp. 197–219). Elsevier Science.
- Dillenbourg, P., & Traum, D. (2006). Sharing Solutions: Persistence and Grounding in Multimodal Collaborative Problem Solving. *Journal of the Learning Sciences*, 15(1), 121–151. doi.org/10.1207/s15327809jls1501\_9
- Dillenbourg P. & Jermann P. (2007). SWISH: a model for designing CSCL scripts. In F. Fischer, H. Mandl, J. Haake & I. Kollar (Eds.), *Scripting Computer-Supported Collaborative Learning—Cognitive, Computational, and Educational Perspectives*. Springer.
- Du Bois, J. (2007). The stance triangle. In R. Englebretson (Ed.), *Stancetaking in Discourse: Subjectivity, evaluation, interaction* (pp. 139-182). John Benjamins Publishing Company. doi.org/10.1075/pbns.164.07du
- Edwards, A. D., & Westgate, D. P. G. (1994). *Investigating classroom talk* (Second ed.). The Falmer Press.
- Edwards, D. (2006). Discourse, cognition and social practices: The rich surface of language and social interaction. *Discourse Studies*, 8(1), 41-49. doi.org/10.1177/1461445606059551

- Engestrom, Y. (1987). *Learning by Expanding*, Orienta-Konsultit.
- Enyedy, N., & Stevens, R. (2014). Analyzing collaboration. In K. Sawyer (Ed.), *The Cambridge Handbook of the Learning Sciences* (2nd ed., pp. 191–212). Cambridge University Press.
- Farr, F. (2003). Engaged listenership in spoken academic discourse: The case of student–tutor meetings. *Journal of English for Academic Purposes*, 2(1), 67-85. doi.org/10.1016/S1475-1585(02)00035-8
- Ferguson, L. M., Yonge, O., & Myrick, F. (2004). Students' involvement in faculty research: Ethical and methodological issues. *International Journal of Qualitative Methods*, 3(4), 56-68. doi.org/10.1177/160940690400300405
- Fiacco, J., & Rosé, C. (2018). Towards domain general detection of transactive knowledge building behavior. In *Proceedings of the Fifth Annual ACM Conference on Learning at Scale*. Association for Computing Machinery.
- Fiore, S. M. (2008). Processes in complex team problem solving: Parsing and defining the theoretical problem space. In M. Letsky, N. Warner, S. M. Fiore, & C. Smith (Eds.), *Macro cognition in teams: Theories and methodologies* (pp. 143–164). Ashgate Publishers.
- Fischer, F., Hmelo-Silver, C.E., Goldman, S.R., & Reimann, P. (2018). *International handbook of the learning sciences* (pp. 137–146). Routledge.
- Garcia, A. C., & Baker Jacobs, J. (1999). The eyes of the beholder: Understanding the turn-taking system in quasi-synchronous computer-mediated communication. *Research on Language and Social Interaction*, 32(4), 337-367. https://doi.org/10.1207/S15327973rls3204\_2
- Giles, D. C., Stommel, W., & Paulus, T. M. (2017). Introduction: The microanalysis of online data: The next stage. *Journal of Pragmatics*, 115, 37–41.
- Gosen, M. N., Willemsen, A., & Hiddink, F. (2024): Applying conversation analysis to classroom interactions: students' 'oh'-prefaced utterances and the interactional management of explanations. *Classroom Discourse*, doi.org/10.1080/19463014.2024.2397127
- Graesser, A. C., Person, N. K., & Magliano, J. P. (1995). Collaborative dialogue patterns in naturalistic one-to-one tutoring. *Applied Cognitive Psychology*, 9(6), 495-522. doi.org/10.1002/acp.2350090604
- Graesser, A. C., Fiore, S. M., Greiff, S., Andrews-Todd, J., Foltz, P. W., & Hesse, F. W. (2018). Advancing the science of collaborative problem solving. *Psychological Science in the Public Interest*, 19(2), 59-92. doi.org/10.1177/1529100618808244
- Grice, H.P. (1989). *Studies in the Way of Words*. Harvard University Press.
- Gweon, G., Jain, M., McDonough, J., Raj, B., & Rosé, C. P. (2013). Measuring prevalence of other-oriented transactive contributions using an automated measure of speech style accommodation. *International Journal of Computer-Supported Collaborative Learning*, 8(2), 245-265. doi.org/10.1007/s11412-013-9172-5
- Haddington, P., Keisanen, T., Mondada, L., & Nevile, M. (2014). *Multiactivity in social interaction: Beyond multitasking*. ProQuest Ebook Central https://ebookcentral.proquest.com
- Haneda, M. & Wells, G. (2013). 'Dialogic inquiry and teacher talk in second language classrooms'. In Chapelle, C. (Ed.) *The Encyclopaedia of Applied Linguistics*. Blackwell Publishing.
- Hanks, J. (2019). From research-as-practice to exploratory practice-as-research in language teaching and beyond. *Language Teaching*, 52(2), 143-187. doi.org/10.1017/S0261444819000016
- Hari, J. (2022). *Stolen Focus: Why You Can't Pay Attention*. Bloomsbury Publishing.
- Hatano, G. (1993). Time to merge Vygotskian and constructivist perceptions of knowledge acquisition. In E. A. Forman, N. Minick, & Stone, C. A. Stone (Eds.), *Contexts for learning: Sociocultural dynamics in children's development* (pp. 153-166). Oxford University Press.
- Hepburn, A., & Bolden, G. (2017). *Transcribing for social research*. SAGE Publications Ltd. doi.org/10.4135/9781473920460
- Heritage, J., & Atkinson, J. M. (1984). Introduction. In J. M. Atkinson & J. Heritage (Eds.), *Structures of social action* (pp.1-16). Cambridge University Press. doi.org/10.1017/CBO9780511665868.003

- Heritage, J. (2013). "Epistemics in Conversation." In *Handbook of Conversation Analysis*. In J. Sidnell & T. Stivers (Eds.), 370–394. Blackwell: Oxford.
- Heritage, J., & Sorjonen, M. (1994). Constituting and maintaining activities across sequences: And-prefacing as a feature of question design. *Language in Society*, 23(1), 1-29. doi.org/10.1017/S0047404500017656
- Hinkelman, D. (2018). *Blending technologies in second language classrooms*. Palgrave Macmillan UK. doi:10.1057/978-1-137-53686-0
- Hogan, K., Nastasi, B. K., & Pressley, M. (1999). Discourse Patterns and Collaborative Scientific Reasoning in Peer and Teacher-Guided Discussions. *Cognition and Instruction*, 17(4), 379–432. https://doi.org/10.1207/S1532690XC11704\_2
- Howley, I., Adamson, D., Dyke, G., Mayfield, E., Beuth, J., & Rosé, C. P. (2012). Group composition and intelligent dialogue tutors for impacting students' self-efficacy. In S. Cerri, W. Clancey, G. Papadourakis, & K.K. Panourgia (Eds.), *Intelligent tutoring systems: 11th International Conference*. IOS Publisher.
- Howley, I., Mayfield, E., Rosé, C. P., & Strijbos, J. (2013a). A multivocal process analysis of social positioning in study groups. In D. D. Suthers, K. Lund, C. P. Rosé, C. Teplovs, & N. Law (Eds.), *Productive multivocality in the analysis of group interactions*. Springer. doi.org/10.1007/978-1-4614-8960-3\_11
- Howley, I., Mayfield, E., & Rosé, C. P. (2013b). Linguistic analysis methods for studying small groups. In C. Hmelo-Silver, A. O'Donnell, C. Chan, & C. Chin (Eds.), *International handbook of collaborative learning*. Taylor and Francis.
- Hyland, K. (2005). Stance and engagement: A model of interaction in academic discourse. *Discourse Studies*, 7(2), 173–192.
- Hyland, K. (2012). English for academic purposes and discourse analysis. In Gee, J.P. & Handford, M., (Eds.), *The Routledge Handbook of Discourse Analysis*. Taylor & Francis Group.
- Isohäätä, J., Näykki, P., & Järvelä, S. (2020). Convergences of joint, positive interactions and regulation in collaborative learning. *Small Group Research*, 51(2), 229–264. doi.org/10.1177/1046496419867760
- Javed, F. (2024). "The Evolution of Artificial Intelligence in Teaching and Learning of English Language in Higher Education: Challenges, Risks, and Ethical Considerations". In M.D. Lytras, A. Alkhalidi, S. Malik, A.C. Serban and T. Aldosemani (Eds.), *The Evolution of Artificial Intelligence in Higher Education* (pp. 249-276). Emerald Publishing Limited. https://doi.org/10.1108/978-1-83549-486-820241015
- Jefferson, G. (2004). Glossary of transcript symbols with an introduction. In G. H. Lerner (Ed.), *Conversation analysis: Studies from the first generation* (pp. 13–34). Benjamins.
- Jeong, A. C. (2006). The effects of conversational language on group interaction and group performance in computer-supported collaborative argumentation. *Instructional Science*, 34, 367–397.
- Jeong, H., & Chi, M. T. H. (2007). Knowledge convergence and collaborative learning. *Instructional Science*, 35(4), 287-315. https://doi.org/10.1007/s11251-006-9008-z
- Jeong, H. (2013). Verbal Data Analysis for Understanding Interaction. In C. Hmelo-Silver, C. Chinn, C. Chan, & A. O'Donnell (Eds.), *International handbook of collaborative learning* (pp. 168–183). Routledge.
- Johnson, D. W., & Johnson, R.T. (1991). *Learning together and alone: Cooperative, competitive, and individualistic learning*. Prentice Hall.
- Jonassen, D. H., & Land, S. M. (2012). *Theoretical foundations of learning environments (2nd ed.)*. Routledge.
- Jordan, R. (1997). Speaking for academic purposes. In *English for Academic Purposes: A Guide and Resource Book for Teachers* (Cambridge Language Teaching Library, pp. 193-207). Cambridge University Press. doi.org/10.1017/CBO9780511733062.015
- Jordan, M. E., Schallert, D. L., Park, Y., Lee, S., Chiang, Y. V., Cheng, A.-C. J., Song, K., Chu, H. N. R., Kim, T., & Lee, H. (2012). Expressing uncertainty in computer-mediated discourse: Language as a marker of intellectual work. *Discourse Processes*, 49, 660–692.

- Kimmerle J., Fischer F., & Cress U. (2021). Argumentation and Knowledge Construction. In: Cress U., Rosé C., Wise A.F., & Oshima J. (Eds.), *International Handbook of Computer-Supported Collaborative Learning*. Springer. doi.org.ezproxy.lib.gla.ac.uk/10.1007/978-3-030-65291-3\_10
- Koschmann, T. (1999a). Toward a dialogic theory of learning: Bakhtin's contribution to understanding learning in settings of collaboration. In *Proceedings of the 1999 conference on computer support for collaborative learning, International Society of the Learning Sciences*. repository.isls.org/handle/1/4333
- Koschmann, T. (1999b). The edge of many circles: Making meaning of meaning making. *Discourse Processes*, 27(2), 103-117. doi.org/10.1080/01638539909545053
- Koschmann, T. (2011) Understanding understanding in action. *Journal of Pragmatics*, 43, 435-437.
- Koschmann, T. (2013). Conversation analysis and collaborative learning. In C. Hmelo-Silver, C. Chinn, C. Chan, & A. O'Donnell (Eds.), *International handbook of collaborative learning* (pp. 149–167). Routledge.
- Koschmann, T. (2015). That Old Problem of Intersubjectivity. In diSessa A. A., Levin M. & Brown N. J. S.(Eds.), *Knowledge and interaction: A synthetic agenda for the learning sciences*. Pp. 558-568. Routledge. doi.org/10.4324/9781315757360
- Koschmann, T., & Schwarz, B. B. (2021). Case studies in theory and practice. In U. Cress, C. Rosé, A. F. Wise, & J. Oshima (Eds.), *International handbook of computer-supported collaborative learning*. Springer
- Koshik, I. (2005). *Beyond rhetorical questions: Assertive questions in everyday interaction*. John Benjamins.
- Kuhn, D. and Udell, W. (2003). The development of argument skills. *Child Development*, 74(5), 1245–12.
- Lave, J., & Wenger, E. (1991). *Situated learning: Legitimate peripheral participation*. Cambridge University Press.
- Lave J. (1993). The practice of learning. In S. Chaiklin & J. Lave (Eds.), *Understanding practice: Perspectives on activity and context* (pp. 200-208). Cambridge University Press.
- LeCourt, D. (1999). Writing (without) the body: Gender and power in net worked discussion groups. In K. Blair & P. Takayoshi (Eds.), *Feminist cyberscapes: Mapping gendered academic spaces* (pp. 153-175). Ablex.
- Lester, J. N., & O'Reilly, M. (2019). *Applied conversation analysis: Social interaction in institutional settings*. SAGE Publications, Inc. https://doi.org/10.4135/9781071802663
- Lindwall, O., & Lymer, G. (2011). Uses of “understand” in science education. *Journal of Pragmatics*, 43(2), 452–474.
- Linell, P. (2009). *Rethinking language, mind, and world dialogically*. Information Age Publishing.
- Littleton, K., & Mercer, N. (2013). *Interthinking: Putting talk to work*. Routledge.
- Ludvigsen, S. (2016). CSCL: Connecting the social, emotional and cognitive dimensions. *International Journal of Computer-Supported Collaborative Learning*, 11(2), 115-121. doi.org/10.1007/the Statement1412-016-9236-4
- Lund K., Suthers D.D. (2013). Methodological Dimensions. In D. D. Suthers, K. Lund, C. P. Rosé, C. Teplovs, & N. Law (Eds.), *Productive multivocality in the analysis of group interactions*. Springer. doi.org/10.1007/978-1-4614-8960-3\_2
- MacLure, M., Phillips, T., & Wilkinson, A. M. (1988). *Oracy matters: The development of talking and listening in education*. Open University Press.
- Martin, J. R., & White, P. R. (2005). *The language of evaluation: Appraisal in English*. Palgrave.
- Mayfield, E., & Rosé, C. P. (2011). Recognizing authority in dialogue with an integer linear programming constrained model. In Y. Matsumoto & R. Mihalcea (Eds.), *Proceedings of the 49th Annual Meeting of the Association for Computational Linguistics: Human Language Technologies*. Association for Computational Linguistics.
- McKenna, D., & Palanac, A. (2025). RefugEAP case study: Developing and critically evaluating a free, online trauma-informed english for academic purposes (EAP) programme for refugee-background students. *Journal of Interactive Media in Education*, 2025(1), 6-6. <https://doi.org/10.5334/jime.894>

- Melander, H. (2012). Transformations of Knowledge within a Peer Group. *Knowing and Learning in Interaction. Learning, Culture & Social Interaction* 1(3-4): 232-248. doi.org/10.1016/j.lcsi.2012.09.003
- Mercer, N. (1995). *The guided construction of knowledge: Talk amongst teachers and learners*. Multilingual Matters.
- Mercer, N. (2013). The social brain, language, and goal-directed collective thinking: A social conception of cognition and its implications for understanding how we think, teach, and learn. *Educational Psychologist*, 48(3), 148-168.
- Mercer, N., Hennessy, S., & Warwick, P. (2019). Dialogue, thinking together and digital technology in the classroom: Some educational implications of a continuing line of inquiry. *International Journal of Educational Research*, 97, 187-199. doi.org/10.1016/j.ijer.2017.08.007
- Michaels, S., & O'Connor, C. (2013). Conceptualizing talk moves as tools: professional development approaches for academically productive discussion. In L. B. Resnick, C. Asterhan, & S. N. Clarke (Eds.), *Socializing intelligence through talk and dialogue*. American Educational Research Association.
- Michaels, S., O'Connor, C., & Resnick, L. B. (2008). Deliberative discourse idealized and realized: Accountable talk in the classroom and in civic life. *Studies in Philosophy and Education*, 27(4), 283-297. doi.org/10.1007/s11217-007-9071-1
- Michaels, S., O'Connor, M. C., Hall, M. W., & Resnick L. B. (2010). *Accountable Talk Sourcebook: For Classroom That Works*. University of Pittsburgh Institute for Learning.
- Miyake, N. (2007). Conceptual change through collaboration. In Vosniadou, S. (Ed.), *International handbook of research on conceptual change* (pp. 453-478). Routledge.
- Morita, N. (2004). Negotiating participation and identity in second language communities. *TESOL Quarterly*, 38, 573-603.
- Negueruela-Azarola, E., Próspero N. García, & Buescher, K. (2015). From Interaction to Intra-action: The Internalization of Talk, Gesture, and Concepts in the Second Language Classroom. In N. Markee (Ed.), *The Handbook of Classroom Discourse and Interaction*. John Wiley & Sons. doi.org/ezproxy1.lib.gla.ac.uk/10.1002/9781118531242.ch14
- Ness, I. J., & Riese, H. (2015). Openness, curiosity and respect : Underlying conditions for developing innovative knowledge and ideas between disciplines. *Learning, Culture and Social Interaction*, 6, 29-39.
- Nguyen, Q. (2022). Let's teach Kibot: Discovering discussion patterns between student groups and two conversational agent designs. *British Journal of Educational Technology* 53(6), 1864-1884. doi.org/10.1111/bjet.13219
- Noroozi, O., Teasley, S., Biemans, H. A., Weinberger, A., & Mulder, M. (2013). Facilitating learning in multidisciplinary groups with transactive CSCL scripts. *International Journal of Computer-Supported Collaborative Learning*, 8(2), 189-223. https://doi.org/10.1007/s11412-012-9162-z
- O'Donnell, A. M., & Hmelo-Silver, C. E.. (2013). Introduction. In C. Hmelo-Silver, C. Chinn, C. Chan, & A. O'Donnell (Eds.), *International handbook of collaborative learning* (p. 1). Routledge.
- Okita, S. Y. & Schwartz, D. L. (2013). Learning by Teaching Human Pupils and Teachable Agents: The Importance of Recursive Feedback, *Journal of the Learning Sciences*, 22(3), 375-412. doi.org/10.1080/10508406.2013.807263
- Ouyang, F., Ling, T., & Jiao, P. (2022). Development of group cognition in online collaborative problem-solving processes. *Journal of Educational Computing Research*, 60(3), 599-630. doi.org/10.1177/07356331211047784
- Paavola, S., & Hakkarainen, K. (2005). The knowledge creation metaphor—An emergent epistemological approach to learning. *Science & Education*, 14, 535-557.
- Paulus, T. W. (2005). Collaboration or Cooperation? In T. S. Roberts, (Ed.) *Computer-Supported Collaborative Learning in Higher Education*. Idea Group Publishing.
- Paulus, T. W., & Wise, A. F., (2019). *Looking for insight, transformation, and learning in online talk*. Routledge.
- Persico, D., & Pozzi, F. (2010). The three T's of the structure of online collaborative activities. *Procedia, Social and Behavioral Sciences*, 2(2), 2610-2615. doi.org/10.1016/j.sbspro.2010.03.382

- Ploetzner R., Dillenbourg P., Praier M. & Traum D. (1999) Learning by explaining to oneself and to others. In P. Dillenbourg (Ed.) *Collaborative-learning: Cognitive and Computational Approaches*. (pp. 103-121). Elsevier.
- Ravenscroft, A. and McAlister, S. (2008). Investigating and promoting educational argumentation: towards new digital practices. *International Journal of Research and Method in Education*, 31(3), 317–335.
- Resnick, L. B., Michaels, S., & O'Connor, M. C. (2010). How (well structured) talk builds the mind. In D. D. Preiss, & R. J. Sternberg (Eds.), *Innovations in educational psychology: Perspectives on learning, teaching and human development*, (pp. 163-194). Springer.
- Ritchhart, R., Church, M., Morrison, K., & Perkins, D. N. (2011). *Making thinking visible: How to promote engagement, understanding, and independence for all learners* (First ed.). Jossey-Bass.
- Rodrigues, M., Silva, R., Borges, A. P., Franco, M., & Oliveira, C. (2025). Artificial intelligence: Threat or asset to academic integrity? A bibliometric analysis. *Kybernetes*, 54(5), 2939-2970. <https://doi.org/10.1108/K-09-2023-1666>
- Rogoff, B. (1995). Observing sociocultural activity on three planes: Participatory appropriation, guided participation, and apprenticeship. In J.V. Wertsch, P. Del Rio & A. Alvarez (Eds.), *Sociocultural Studies of Mind* (pp. 139-164). Cambridge University Press.
- Roschelle, J. (1992). Learning by collaboration. Convergent conceptual change. *The Journal of the Learning Sciences*, 2, 235-276.
- Roschelle, J., & Teasley, S. D. (1995). The construction of shared knowledge in collaborative problem solving. In C. O'Malley (Ed.), *Computer-Supported Collaborative Learning* (pp. 69–97). Springer. doi.org/10.1007/978-3-642-85098-1\_5
- Rosé, C. P., Wang, Y. C., Cui, Y., Arguello, J., Stegmann, K., Weinberger, A., et al. (2008). Analyzing collaborative learning processes automatically: Exploiting the advances of computational linguistics in computer-supported collaborative learning. *International Journal of Computer Supported Collaborative Learning*, 3, 237–271.
- Rosé, C. P., (2013). A Multivocal Analysis of the Emergence of Leadership in Chemistry Study Groups. In D. D. Suthers, K. Lund, C. P. Rosé, C. Teplovs, & N. Law (Eds.), *Productive multivocality in the analysis of group interactions*. Springer. doi.org/10.1007/978-1-4614-8960-3\_13
- Rummel, N., & Spada, H. (2005). Learning to collaborate: An instructional approach to promoting collaborative problem solving in computer-mediated settings. *The Journal of the Learning Sciences*, 14(2), 201-241. [https://doi.org/10.1207/s15327809jls1402\\_2](https://doi.org/10.1207/s15327809jls1402_2)
- Sacks, H., Schegloff, E. A., & Jefferson, G. (1974). A simplest systematics for the organization of turn-taking for conversation. *Language*, 50, 696–735.
- Sacks, H. (1984). Notes on methodology. In J. M. Atkinson (Ed.), *Structures of Social Action* (pp. 21–27). Cambridge University Press.
- Sacks, H. (1992). *Lectures on Conversation. Two Volumes* (Ed. by G. Jefferson) Blackwell.
- Salomon, G. (Ed.) (1993). *Distributed cognitions: Psychological and educational considerations*. Cambridge University Press.
- Sarmiento-Klapper, J. W. (2009). The Sequential Co-Construction of the Joint Problem Space (JPS) as a metaphor for the social order that is established in small-group problem-solving interactions. In G. Stahl (Ed.), *Studying virtual math teams*. Springer. doi.org/10.1007/978-1-4419-0228-3
- Sawyer, R. K., & Berson, S. (2004). Study group discourse: How external representations affect collaborative conversation. *Linguistics and Education*, 15(4), 387-412. doi.org/10.1016/j.linged.2005.03.002
- Sawyer, R. K., (Ed.), (2013) Qualitative Methodologies for Studying Small Groups. In C. Hmelo-Silver, C. Chinn, C. Chan, & A. O'Donnell (Eds.), *International handbook of collaborative learning* (pp. 126–148). Routledge.
- Scardamalia, M. (2002). Collective cognitive responsibility for the advancement of knowledge. In B. Smith (Ed.), *Liberal Education in a Knowledge Society* (pp. 67–98). Open Court.
- Scardamalia, M., & Bereiter, C. (2003). Knowledge building. In J. W. Guthrie (Ed.), *Encyclopedia of education* (2nd ed., pp. 1370–1373). Macmillan.

- Scardamalia, M., & Bereiter, C. (2014). Smart technology for self-organizing processes. *Smart Learning Environments*, 1. doi.org/10.1186/s40561-014-0001-8
- Scardamalia, M., & Bereiter, C. (2021). Knowledge building: Advancing the state of community knowledge. In U. Cress, C. Rosé, A. F. Wise, & J. Oshima (Eds.), *International handbook of computer-supported collaborative learning*. Springer.
- Schegloff, E., & Sacks, H. (1973). Opening up closings. *Semiotica*, 8, 289-327.
- Schegloff, E. A. (1985). On some questions and ambiguities in conversation. In J. M. Atkinson (Ed.), *Structures of Social Action* (pp. 28–52). Cambridge University Press.
- Schegloff, E. A. (2000). When 'others' initiate repair. *Applied Linguistics*, 21(2), 205-243. <https://doi.org/10.1093/applin/21.2.205>
- Schegloff, E. A. (2007). *Sequence organization in interaction: A primer in conversation analysis*. Cambridge University Press.
- Schwarz, B., Dreyfus, T., & Hershkowitz, R. (2009). *Transformation of Knowledge through Classroom Interaction* (1st ed.). Routledge. <https://doi.org/10.4324/9780203879276>
- Schwarz, B. B., & Baker, M. (2017). *Dialogue, argumentation and education: history, theory and practice*. Cambridge University Press.
- Schwartz, D. L. (1995). The emergence of abstract dyad representations in dyad problem solving. *The Journal of the Learning Sciences*, 4, 321-354.
- Schwartz, D. L. (1999). The productive agency that drives collaborative learning. In P. Dillenbourg (Ed.), *Collaborative learning: Cognitive and computational approaches* (pp. 197–219). Elsevier Science.
- Seedhouse, P. (2004). Conversation analysis methodology. *Language Learning*, 54 (1), 1–54. doi.org/10.1111/j.1467-9922.2004.00268.x
- Shirouzu, H. (2013). Focus-Based Constructive Interaction. In D. D. Suthers, K. Lund, C. P. Rosé, C. Teplov, & N. Law (Eds.), *Productive multivocality in the analysis of group interactions*. Springer. doi.org/10.1007/978-1-4614-8960-3\_5
- Simpson, A., Bannister, N. & Matthews, G. (2017). Cracking their codes: understanding shared technology resources as positioning artifacts for power and status in CSEL environments. *Intern. J. Comput.-Support. Collab. Learn* 12, 221–249 (2017). doi.org/10.1007/s11412-017-9261-y
- Sinha, S., Rogat, T. K., Adams-Wiggins, K. R., & Hmelo-Silver, C. E. (2015). Collaborative group engagement in a computer-supported inquiry learning environment. *International Journal of Computer-Supported Collaborative Learning*, 10(3), 273–307. doi.org/10.1007/s11412-015-9218
- Sionti, M., Ai, H., Rosé, C. P., & Resnick, L. B. (2012). A framework for analyzing development of argumentation through classroom discussions. In N. Pinkwart & B. McClaren (Eds.), *Educational technologies for teaching argumentation skills*. Bentham Science.
- Skidmore, D., & Murakami, K. (2012). Claiming our own space: Polyphony in teacher–student dialogue. *Linguistics and Education*, 23, 200–210.
- Skyrme, G. (2010). 'Is this a stupid question? International undergraduate students seeking help from teachers during office hours'. *Journal of English for Academic Purposes*, 9: 211–221.
- Slavin, R. E. (1983). *Cooperative learning*. New York: Longman.
- Sohmer, R., Michaels, S., O'Connor, M. C., & Resnick, L. (2009). Guided construction of knowledge in the classroom. In B. Schwarz, T. Dreyfus, & R. Hershkowitz (Eds.), *Transformation of knowledge through classroom interaction* (pp. 105–129). Taylor and Francis.
- Stahl, G. (2006). *Group cognition: Computer support for collaborative knowledge building*. MIT Press.
- Stahl, G. (2009). *Studying virtual math teams*. Springer. doi.org/10.1007/978-1-4419-0228-3
- Stahl, G. (2011). Seeing what we mean: Co-experiencing a shared virtual world. *Computer Supported Collaborative Learning Conference Proceedings*.
- Stahl, G., & Rosé, C. P. (2011). Group cognition in online teams. In E. Salas, & S. M. Fiore (Eds.), *Theories of team cognition: Cross-disciplinary perspectives*. Routledge.
- Stahl, G. (2013). Interaction analysis of a biology chat. In D. D. Suthers, K. Lund, C. P. Rosé, C. Teplov, & N. Law (Eds.), *Productive multivocality in the analysis of group interactions*. Springer. doi.org/10.1007/978-1-4614-8960-3\_28

- Stahl, G., Cress, U., Ludvigsen, S., & Law, N. (2014). Dialogic foundations of CSCL. *International Journal of Computer-Supported Collaborative Learning*, 9(2), 117-125.
- Stahl, G., & Hakkarainen, K. (2021). Theories of CSCL. In U. Cress, C. Rosé, A. F. Wise, & J. Oshima (Eds.), *International handbook of computer-supported collaborative learning*. Springer.
- Suthers, D. D. (2006). Technology affordances for intersubjective meaning making: A research agenda for CSCL. *International Journal of Computer-Supported Collaborative Learning*, 1(3), 315-337. doi.org/10.1007/s11412-006-9660-y
- Suthers, D. D., Dwyer, N., Medina, R., & Vatrapu, R. (2010). A framework for conceptualizing, representing, and analyzing distributed interaction. *International Journal of Computer Supported Collaborative Learning*, 5(1), 5-42. doi.org/10.1007/s11412-009-9081-9
- Suthers, D. D., Lund, K., Rosé, C. P., Teplovs, C. & Law, N. (2013). *Productive Multivocality in the Analysis of Group Interactions*. Springer. doi.org/10.1007/978-1-4614-8960-3
- Swain, M (2006). Linguaging, agency and collaboration in advanced second language proficiency. In: Byrnes, H. (Ed.), *Advanced language learning: The contribution of Halliday and Vygotsky* (pp. 95-108). Continuum.
- Swain, M., & Lapkin, S. (2000). Task-based second language learning: The uses of the first language. *Language Teaching Research: LTR*, 4(3), 251-274. doi.org/10.1191/136216800125087
- Tan, T.B. (2003). 'Does talking with peers help learning? The role of expertise and talk in convergent group discussion tasks'. *Journal of English for Academic Purposes*, 2: 53-66. doi.org/10.1016/S1475-1585(02)00033-4
- Teasley, S. D., & Roschelle, J. (1993). Constructing a joint problem space: the computer as a tool for sharing knowledge. In S. P. Lajoie, & S. J. Derry (Eds.), *Computers as cognitive tools* (pp. 229-258). Lawrence Erlbaum Associates, Inc.
- Teasley, S. D. (1997). Talking about reasoning: How important is the peer in peer collaboration? In L. B. Resnick, R. Säljö, C. Pontecorvo, & B. Burge (Eds.), *Discourse, tools and reasoning: Essays on situated cognition* (pp. 364-384). Springer.
- Tegos, S., Demetriadis, S., & Karakostas, A. (2015). Promoting academically productive talk with conversational agent interventions in collaborative learning settings. *Computers and Education*, 87, 309-325. doi.org/10.1016/j.compedu.2015.07.014
- Tegos, S., Demetriadis, S., Papadopoulos, P. M., & Weinberger, A. (2016). Conversational agents for academically productive talk: a comparison of directed and undirected agent interventions. *International Journal of Computer-Supported Collaborative Learning*, 11(4), 417-440. doi.org/10.1007/s11412-016-9246-2
- Trausan-Matu, S. (2013). Collaborative and differential utterances, pivotal moments, and polyphony. In D. D. Suthers, K. Lund, C. P. Rosé, C. Teplovs, & N. Law (Eds.), *Productive multivocality in the analysis of group interactions*. (pp. 123-139). Springer. doi.org/10.1007/978-1-4614-8960-3\_6
- Trausan-Matu S., Wegerif R., Major L. (2021). Dialogism. In: Cress U., Rosé C., Wise A.F., Oshima J. (Eds.) *International Handbook of Computer-Supported Collaborative Learning*. Springer doi.org.ezproxy.lib.gla.ac.uk/10.1007/978-3-030-65291-3\_12
- Tudge, J. (1992). Processes and consequences of peer collaboration: A Vygotskian analysis. *Child Development*, 63, 1364-1379
- Uttamchandani S., & Lester J. N. (2021). Qualitative Approaches to Language in CSCL. In: Cress U., Rosé C., Wise A.F., & Oshima J. (Eds.), *International Handbook of Computer-Supported Collaborative Learning*. Springer. doi.org/10.1007/978-3-030-65291-3\_33
- van Aalst, J., & Chan, C. K. K. (2007). Student-directed assessment of knowledge building using electronic portfolios in Knowledge Forum. *The Journal of the Learning Sciences*, 16, 175-220.
- van Aalst, J. (2009). Distinguishing knowledge-sharing, knowledge-construction, and knowledge-creation discourses. *International Journal of Computer-Supported Collaborative Learning*, 4(3), 259-287. doi.org/10.1007/s11412-009-9069-5
- van Heijst, H., de Jong, F. P. C. M., van Aalst, J., de Hoog, N., & Kirschner, P. A. (2019). Socio-cognitive openness in online knowledge building discourse: Does openness keep conversations

- going? *International Journal of Computer-Supported Collaborative Learning*, 14(2), 165-184. doi.org/10.1007/s11412-019-09303-4
- van Eemeren, F. H., Grootendorst, R., Henkenmans, F. S., Blair, J. A., Johnson, R. H., et al. (1996). *Fundamentals of Argumentation Theory: A Handbook of Historical Background and Contemporary Developments*. Erlbaum.
- Van Lier, L. (2007). Action-based Teaching, Autonomy and Identity. *International Journal of Innovation in Language Learning and Teaching*, 1(1), 46-65, doi/ 10.2167/illt42.0
- von Aufschnaiter, C., Erduran, S., Osborne, J., & Simon, S. (2008). Arguing to learn and learning to argue: Case studies of how students' argumentation relates to their scientific knowledge. *Journal of Research in Science Teaching*, 45(1), 101-131. doi.org/10.1002/tea.20213
- Vosniadou, S. (2003). Exploring the relationships between conceptual change and intentional learning. In G. M. Sinatra, & P. R. Pintrich (Eds.) *Intentional conceptual change*. (pp. 377-406). Erlbaum.
- Vosniadou, S. (2007). Conceptual change and education. *Human Development*, 50, 47-54.
- Vosniadou, S. (2008). *International handbook of research on conceptual change* (2nd ed.), Routledge.
- Vygotsky, L. S. (1962). *Thought and language*. <https://doi.org/10.1037/11193-000>
- Vygotsky, L. S. (1978). Mind in society. In Cole, M., John-Steiner, V., Scribner, S. & Souberman, E., (Eds.), *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Waring, H. Z. (2002). Displaying substantive reciprocity in seminar discussion. *Research on Language and Social Interaction*, 35(4), 453-479. doi.org/10.1207/S15327973RLSI3504\_3
- Webb, N. M. (2013). Information processing approaches to collaborative learning. In C. Hmelo-Silver, C. Chinn, C. Chan, & A. O'Donnell (Eds.), *International handbook of collaborative learning* (pp. 19-40). Routledge.
- Wegerif, R. (2007). *Dialogic, education and technology: Expanding the space of learning*. Springer.
- Wegerif, R., McLaren, B. M., Chamrada, M., Scheuer, O., Mansour, N., Mikšátko, J., & Williams, M. (2010). Exploring creative thinking in graphically mediated synchronous dialogues. *Computers & Education*, 54, 613-621. doi.org/10.1016/j.compedu.2009.10.015
- Wegerif, R. (2019). Dialogic Education. *Oxford encyclopedia of research on education*. Oxford University Press.
- Weinberger A. and Fischer F. (2006). A framework to analyze argumentative knowledge construction in computer supported collaborative learning. *Computers and Education*, 46, 71 – 95.
- Weinberger, A., Stegmann, K., & Fischer, F. (2007). Knowledge convergence in collaborative learning: Concepts and assessment. *Learning and Instruction*, 17(4), 416-426. doi.org/10.1016/j.learninstruc.2007.03.007
- Weiss, G. & Dillenbourg, P. (1999) What is 'multi' in multi-agent learning? In Dillenbourg, P. (Ed.) (1999). *Collaborative learning: Cognitive and computational approaches* (pp. 197-219). Elsevier Science.
- Wells, G. (2007). Semiotic mediation, dialogue and the construction of knowledge. *Human Development*, 50(5), 275-285.
- Wells, G., Bridges, A., French, P., MacLure, M., Sinha, C., & Walkerdine, V. (1981). Language as interaction. In *Learning through Interaction: The Study of Language Development* (pp. 22-72). Cambridge University Press.
- Wertsch, J. (1993). *Voices of the Mind: A sociocultural approach to mediated action*. Harvard University Press.
- Wertsch, J. V. (1991). A Sociocultural Approach to Socially Shared Cognition. In: Resnick, L. B., Levine, J. M. & Teasley, S. D. (Eds.), *Perspectives on Socially Shared Cognition* (pp. 85-100). American Psychological Association.
- Wertsch, J.V. (2002). Computer Mediation, PBL, and Dialogicality. (Special issue). *Distance Education*, 23(1): 105-108.
- Widdowson, H. G. (1979). *Explorations in applied linguistics*. OUP.

- Wilkinson, A. (1991). Evaluating group discussion. *Educational Review (Birmingham)*, 43(2), 131-141. doi.org/10.1080/0013191910430203
- Willis, J. R. (1996). *A framework for task-based learning*. Longman.
- Wise, A. F., & Chiu, M. M. (2011). Analyzing temporal patterns of knowledge construction in a role-based online discussion. *International Journal of Computer-Supported Collaborative Learning*, 6(3), 445-470. doi.org/10.1007/s11412-011-9120-1
- Wise, A. F., Zhao, Y., Hausknecht, S., & Chiu, M. M. (2013). Temporal considerations in analyzing and designing online discussions in education: Examining duration, sequence, pace, and salience. In Barbera, E. & Reimann, P. (Eds.) (2014). *Assessment and Evaluation of Time Factors in Online Teaching and Learning*. IGI Global Scientific Publishing. https://doi.org/10.4018/978-1-4666-4651-3
- Ziegler, M. F., Paulus, T. M., & Woodside, M. (2006). This course is helping us all arrive at new viewpoints, isn't it? Making meaning through dialogue in a blended environment. *Journal of Transformative Education*, 4(4), 302-319. doi.org/10.1177/1541344606294819
- Ziegler, M. F., Paulus, T., & Woodside, M. (2014). Understanding informal group learning in online communities through discourse analysis. *Adult Education Quarterly*, 64(1), 60-78. doi.org/10.1177/0741713613509682
- Zoethout, H., Wesselink, R., Runhaar, P., & Mulder, M. (2017). Using Transactivity to Understand Emergence of Team Learning, *Small Group Research*, 48(2), 190-214