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## Patterns of Interaction: Analysis of Mixed-Age Peer Interactions in Secondary School Classrooms in Germany

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### ABSTRACT

This study explored peer interactions in mixed-age English as a foreign language (EFL) secondary school classrooms in Germany which are simultaneously mixed-ability classrooms. Mixed-age classrooms are increasingly used (Thurn, 2011), but research in language classrooms is lacking. Studies on peer-interactions within M-A groups/pairs in L2 contexts are not available. Research in mainstream mixed-age classrooms suggests benefits for both younger and elder learners (Veenman, 1995; Little, 2001, 2007; Kuhl et al. 2013). Twelve mixed-age pairs of young adolescent learners were audio-recorded when interacting on regular classroom tasks, which were a part of one unit of work, lasting a period of two and half months. After the unit of work, individual interviews were conducted in order to elicit learners' perceptions of their interactions. Applying Storch's (2002) framework, the study examined patterns of interaction the pairs establish. This is important as Storch (2002) has shown that only some patterns of interaction may be indicative of learning. Findings show that mixed-age pairs formed predominantly patterns of interaction, which are conducive to learning, namely *expert/novice* and *collaborative* pattern (Storch, 2002). However, there was some difficulty to apply Storch's framework to interactions of young adolescent learners. This difficulty seemed to be attributable to a certain level of ambiguity of the definitions of mutuality and equality, and the associated traits that determine them. The study also explored learning opportunities afforded by mixed-age peer interactions, operationalized in this study as language related episodes (LREs). The findings suggest that non-collaborative attitudes and patterns of behaviour may not necessarily imply limited opportunities for learning.

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Classrooms, which consist of two or three different grades are called mixed-age (M-A) classrooms (sometimes referred to as *multi-grade*, *mixed-grade* or *composite classes*). In one M-A class the grades can range from the 1st to the 3rd, from the 4th to the 6th and from the 7th to the 9th grade in the case of three-grade classrooms. Schools that set up M-A classes do so either out of demographic and economic necessity (Smit, Beihammer, Kaisa, & Raggl, 2015), or mainly because of the belief of the teaching

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community in the positive pedagogical and social outcomes of this approach (Hoffman, 2003; Little, 2001, 2007; Koerrenz, 2011; Thurn, 2011). The latter is the case at the research site. Schools that set up M-A classes based on such a belief, have become a common phenomenon worldwide (Veenman, 1995; Little, 2001; 2002; Kalaojae & Pietarinen, 2009; Lindström & Lindahl, 2011; Smit & Engeli, 2015). One of the main arguments for M-A classes is that grouping learners simply according to their age does not take learners' cognitive and social development into account (Thurn, 2011). In other words, the supporters of M-A classes claim that even children of same-age classes do not share the same level of academic performance, maturity, sociocultural experiences, interests and abilities (Gerard, 2009, p.243; see also Thurn, 2011). On the other hand, the philosophy of grouping children across ages and grades is based on the belief that so doing aids cognitive and social growth and diminishes antisocial behavior (Hoffman, 2003, p. 6, see also Hartup, 2005). For example, Song et al. (2009) argue that M-A classrooms afford more cooperative behavior and diminish competition as they represent "a natural environment for social behaviors to thrive such as helping, sharing, and taking turns" (p.5). It is also often claimed that the younger learners benefit from being tutored or mentored by their elder peers, while the elder learners benefit from teaching the younger ones (Veenman, 1995; Little, 2001, 2007; Thurn, 2011). The research is, however, inconclusive in this regard. For example, research in general education has explored peer tutoring among cross-age and same-age peers and their effects on learning gains. It has to be mentioned that this context is not identical to M-A context as in contrast to the research site, learners in these studies did not attend the same class. Studies by Topping (2005, 2011) and Topping and Bryce (2004) found that peer tutoring may promote learning of both the tutor and the tutee. Interestingly, in their study which involved tutors and tutees of similar abilities, they found that same-age peer tutoring may boost similar learning gains as cross-age peer tutoring. However, they also explained that the effectiveness of peer tutoring is increased if students are allowed to choose to be a tutor or a tutee, according to the task and its nature (Topping & Bryce, 2004). Contrasting results were found by Robinson, Schofield and Steers-Wentzell (2003) who reported that cross-age tutoring hinders establishment of reciprocal tutoring, and is therefore not as effective as same-age tutoring. Similarly, the study by Duran and Monereo (2005) showed that an interaction between a tutor and a tutee in an equal, reciprocal nature is most effective in terms of learning gains.

Unfortunately, we know very little from the general education research about peer-interactions among learners in M-A classrooms. Moreover, although some research has been conducted in L2 mixed-proficiency settings, L2 research into M-A peer interactions is lacking.

This study seeks to fill that gap in L2 research into M-A peer interactions, focusing on M-A peer interactions among young adolescent learners in an English as a foreign language classroom. Using data from a naturalistic foreign language classroom, this study explores patterns of interactions established among pairs during common classroom tasks and learning opportunities afforded by these interactions.

## **2. Theoretical Background**

Interaction is a central aspect in sociocultural theory (SCT). The importance of interaction in SLA according to SCT is that interaction is a necessary tool for creating a ZPD (zone of proximal development) of a particular learner (Lantolf & Thorne, 2006; Swain, 2006). Sociocultural theory provides a lens through which to view L2 learning because it underlines the role of language and especially of dialogic interaction in learning and development (Lantolf & Thorne, 2006). SCT holds that children develop cognitively only through the process of social interaction, and that this process is enabled by semiotic tools such as language, which have the capacity to mediate our learning (Lantolf & Thorne, 2006; Swain, 2000; Swain, 2006). In addition, learning and development occur in learners' interaction with people in his/her environment such as in cooperation with his/her peers (see Vygotsky 1978, p. 90). And because language is an important tool which mediates social interaction, and it is through language (including speaking and

writing activity) through which higher forms of human mental activity are mediated, it can be said that a social interaction between two learners using a language while working together to complete a language task has the potential to mediate learning.

Research has investigated how peer collaborative dialogue mediates second language learning and development. Researchers have argued that peer collaborative dialogues mediate the construction of linguistic knowledge, and that this process of joint construction contributes to L2 development (Swain, 2000, 2010; Swain et al., 2009; Swain & Lapkin, 2001, 2002). Swain and her colleagues conducted studies in which they analyzed students' pair/group talk for language-related episodes during various tasks in such collaborative dialogues and have shown that such episodes promote second language development. As learners attempt to solve a linguistic problem, they construct and analyze the new linguistic forms, which enables them to learn new language or knowledge about language, thus improving their language use. The process of making meaning and shaping knowledge and experience through language is referred to as *linguaging* (Swain, 2006). Linguaging is "when language is used to mediate problem solutions, whether the problem is about which word to use, or how best to structure a sentence" (p.98). The potential benefits of linguaging (LREs) in peer interaction have been investigated by research (Dao & McDonough, 2017; Fernández Dobao, 2012; 2014; García Mayo & Zeitler, 2017; McDonough, 2004; Philp & Tognini, 2009; Toth, Wagner & Moranski, 2013; Williams, 2001). For example, Williams (2001) explored linguaging in a classroom based study which implemented oral tasks. She reported a predominant focus on lexical items and therefore a more frequent occurrence of lexical LREs. In contrast to this, studies investigating peer interaction on more pedagogic tasks such as text reconstruction and reformulation task reported a high focus on grammar resulting in more grammatical LREs (Iwashita, 2001; Kowal & Swain, 1994; Swain & Lapkin, 2002).

### 3. Literature Review

L2 research into M-A peer interactions is still lacking. There has, however, been a considerable body of research conducted in mixed-proficiency settings. Although the research in mixed-proficiency settings has been carried out among same-age learners, it is of particular relevance to this study in that it involves interaction among learners whose proficiencies differ. Some of the studies suggest that it may not be proficiency differences that are the main moderating factors of collaborative work, but the relationship between pair members and the pattern of interaction co-constructed by both learners might have greater impact (Storch, 2002; Watanabe & Swain, 2007). However, some researchers have claimed that proficiency differences within pairs/groups can create a different pattern of interaction which will have an effect on learning (Dao & McDonough, 2017; Kim & McDonough, 2008; Leeser, 2004; Storch & Aldosari, 2013). For example, in the investigation of the effect of task role on Vietnamese EFL learners' collaboration in mixed proficiency dyads, Dao and McDonough (2017) focused on whether task role impacts on the nature of L2 learners' discussions or their pair dynamics. In this study, sixty English L2 learners at a Vietnamese university carried out a story telling task. When the lower-proficiency learner performed the task role as information holder, pairs generated more LREs and their interactions were richer in mutuality. In addition, some of the studies advise that low proficiency (LP) learners may be disadvantaged in a mixed-proficiency pairing and that they may feel more comfortable when interacting with peers rather than with high proficiency (HP) partners (Kowal & Swain, 1994; Leeser, 2004; Young & Teddick, 2016).

Furthermore, research in second language learning has shown that when learners are working on a task in a pair/group work, an important factor that impacts on second language learning and development is the quality of their engagement (Damon & Phelps, 1989; Dao & McDonough, 2018; Philp & Duchesne, 2016; Storch, 2008) and the patterns of interaction established by the learners (Galaczi, 2008; Li & Zhu, 2017; Storch, 2002; Watanabe & Swain, 2007). Quality of engagement is explained by Damon &

Phelps (1989) in terms of equality and mutuality. Both partners' engagement is equal if both parties in an engagement have an equal degree of control over the direction of a task. Interaction is high on equality when learners equally contribute to the task and regularly take directions from one another. Mutuality is high when both learners frequently engage with each other's contributions, providing a rich reciprocal feedback and sharing ideas (p.13). Referring to the sociocultural theory, Storch (2002) investigated the nature of pair interaction in an adult classroom. Storch was mainly interested in how learners approach the task, the roles they assume, and the level of involvement and contribution of each member of the pair to the task (p.126). She found four distinct patterns of interaction (collaborative-dominant/passive-dominant/passive-expert/novice). Based on Damon and Phelps (1989) she distinguishes these patterns in terms of equality and mutuality. She suggests that it is collaborative pattern of interaction, which is the most conducive to learning because in the collaborative pattern, both learners work together throughout the whole task and assist each other. The collaborative and expert/novice patterns are said to result in more knowledge transfer than the pairs with a non-collaborative orientation (dominant/dominant and dominant/passive) (Storch, 2002; 2009; see also Watanabe & Swain, 2007; Storch & Aldosari, 2012).

Researchers have also found patterns of interaction, different to those found by Storch (2002). For example, a *cooperative* pattern of interaction is marked with higher level of contribution of both learners, but with low or medium level of learners' engagement with their contributions (Li & Zhu, 2017; Rouhshad & Storch, 2016; Tan, Wigglesworth & Storch, 2010). Li and Zhu (2013) investigated the nature of computer-mediated interaction of three groups of English as a foreign language performing collaborative writing tasks using wikis at a Chinese university. They found patterns of interaction which they termed *collectively contributing/mutually supportive*, *authoritative/responsive*, and *dominant/withdrawn*. In their later study, Li and Zhu (2016) examined dynamic patterns of interaction of two small groups of ESL students performing two writing tasks in a wiki site. Researchers report that both groups switched to different patterns during their interactions. Group one changed from a *collective* pattern in the first task to an *active/withdrawn pattern* in the second task. Group two formed a *dominant/defensive* pattern in the first, but changed to a *collaborative* pattern in the second task. Finally, Galaczi (2008) found that an interaction may contain traces of more than one pattern of interaction and termed such pattern of interaction as *blend*.

Overall, these studies suggest that learners may form different patterns of interaction to those proposed by Storch (2002). It must, however, be said that most of these patterns were identified in computer mediated collaborative writing or in language testing contexts, which are different to a naturalistic language classroom.

Studies which examined patterns of interaction also suggest that patterns of interaction are closely related to opportunities for language learning afforded by those interactions. For example, patterns of interaction impact on the quality and quantity of learners' languaging (e.g. Kim & McDonough, 2008; Storch & Aldosari, 2013; Watanabe & Swain, 2007), on learners' scaffolding (e.g. Storch, 2002) and on the quantity and quality of L2 practice (e.g. Storch, 2002; Storch & Aldosari, 2010). Furthermore, researchers have also demonstrated that patterns of interaction affect learners' language learning outcomes, for example the quality of texts learners produce (e.g. Li & Zhu, 2013; 2016; McDonough, Crawford & De Vleeschauwer, 2016). Finally, patterns of interaction influence learners' level of enjoyment (Li & Zhu, 2013, 2016; Storch, 2004).

It follows that if we are to understand how peer interaction works in M-A classrooms and benefit from its implementation, it is important to investigate how grouping of learners across age (simultaneously proficiency) may impact on patterns of interaction formed by learners in relation to learning and development. Such investigation may for example reveal to what extent both learners contribute to the task and whether they are willing to offer and engage with each other's contributions (Storch, 2001a). This is especially important, as the pairs under investigation are learners of different ages and proficiencies. For example, it is likely that such a pairing of learners would result in an unequal

interaction with a low level of engagement with each other's contributions if the work were dominated by the older and/or by the more proficient learner while the younger and/or less proficient learner's participation were passive (see Kowal & Swain, 1994; Leiser, 2004; Young & Tedick, 2016). However, because Storch's framework is based on research involving adult ESL learners engaged in writing tasks, it is important to explore to what extent is Storch's framework applicable to interactions among young adolescent learners in a foreign language classroom who are engaged in other than writing tasks. This study explores classroom based peer interactions M-A EFL secondary school classrooms that are simultaneously mixed-proficiency classrooms. The primary aim of the study is to explore to patterns of interaction (Galaczi, 2008; Choi & Iwashita, 2016; Li & Zhu, 2013; 2017; Storch, 2001a; 2002; Storch & Aldossari, 2012; Watanabe & Swain, 2007) among young adolescent learners when interacting on common foreign language classroom tasks assigned by the teacher. The secondary aim is to explore learning opportunities afforded by these interactions, operationalized in this study as language related episodes (LREs). This study aims to lay the foundations for future research of mixed-age peer interactions in language classrooms. Two research questions are posed as below.

- 1) What patterns of interaction can be found among mixed-age pairs of German learners of English as a foreign language at an alternative secondary school?
- 2) To what extent do secondary school mixed-age groups/pairs engage with and resolve LREs during their collaborative dialogue?

## 4. Method

### 4.1. Context

The context of this study was English as a foreign language classroom at an alternative school secondary school in Germany. Because learners' language proficiencies widely differ and very low proficiency and very high proficiency learners share the same classroom, such great heterogeneity in terms of proficiency is the main argument for an individualized and learner-centered approach at this school. Therefore, learners are usually allowed individual learning paths and to progress at their own speed and level. Learning relies on assignments, which learners accomplish either on their own, with a partner, in small study-groups, or with the teacher's help, depending on their needs and abilities. English curriculum at the research site consisted of three lessons a week of which two were teacher-led lessons and one was *self-study time* (Studiezeit), during which I, the teacher and researcher, was not present, and during which learners worked on tasks included in their *study plan* (Fachplan). Each of the two study plans used in the current study encompassed one unit of work, lasting two and half months. They contained collaborative tasks and exercises (see Appendix B) which were to be completed with a self-selected partner, as long as he/she was of a different age/grade. The reason for this step was that allowing learners to choose their partner is the usual practice in these classrooms, as revealed in the interviews that had been conducted with other language teachers.

### 4.2. Participants

The participants involved in this study were 22 learners who attended three M-A classes composed of 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> graders. They formed 11 mixed-age pairs. However, the data is available only from 20 learners (Table 1) due to illness and attrition. Pseudonyms are used throughout the study. Some of the participants are very close friends and some are acquaintances. The majority of learners have known each other for a long period of time. Some have spent a considerable amount of time learning together and doing assignments related to other subjects. All participants have learned English since grade three.

One of the drawbacks is that learners' language proficiency could not be assessed independently of school based assessment. Participants' relative proficiency can only be made visible by two classroom achievement tests which were taken throughout the first term. These tests measured listening, reading and writing competences. The last classroom achievement test was taken by the students two weeks prior to the unit of work. Their relative proficiency was also determined by other summative classroom assessment practices which aimed to determine learners' speaking skills, grammatical knowledge and vocabulary. Summative forms of assessment were supplemented by formative assessment practices in the form of observation of learners' performance during lessons and taking notes. All assessment practices were administered by me. Table 1 shows relative proficiency score as determined by all the assessment practices mentioned above. However, these assessment practices differed across grades, and a true comparison of learners' language abilities is not possible. In other words, the assessment practices were specific to grade, and therefore the description is relative to the particular grade, and not an estimate relative to overall proficiency.

Table 1.  
Participant Characteristics

Pair number	Name	Gender	Grade	Relative proficiency
Pair 1	Lara	F	9	H
	Ella	F	8	H
Pair 2	Emilia	F	9	A
	Stella	F	7	A
Pair 3	Irena	F	7	A
	Sara	F	8	A
Pair 4	John	M	9	H
	Will	M	7	H
Pair 5	Lea	F	9	H
	Jess	F	8	A
Pair 6	Lilliana	F	7	H
	Leni	F	8	A
Pair 7	Riki	F	8	A
	Lyn	F	7	L
Pair 8	Gussi	M	8	H
	Jossi	M	7	H
Pair 9	Lenka	F	8	A
	Lucy	F	7	A
Pair 10	Alena	F	8	H
	Enna	F	7	H

H: high proficiency/A: average proficiency/L: low proficiency (relative to year group as assessed by the first term assessment practices)

#### 4.3. Data Collection and Instruments

Data were collected during everyday common classroom lessons. They were collected during the winter term, over one unit of work lasting two and months in total. The following data collection instruments were used.

#### 4.3.1. Audio-recordings

Audio-recordings included recordings of ten pair interactions on four selected classroom tasks which were part of the 8<sup>th</sup> and 9<sup>th</sup> grade syllabus. Although some recordings were made by me during regular English lessons, the majority of them were made by students themselves during the study time lessons. Some data is missing due to students' illnesses or technical failure to record interactions properly. The number of tasks carried out differed slightly across pairs, ranging between 10 to 12 tasks per pair. However, only four to six interactions per pair (total 52 interactions) were selected for the qualitative analysis, and four interactions per pair for the quantitative analysis. In order to increase ecological validity, the tasks which took place in the middle and towards the end of the whole period were chosen for analysis. Another reason for this step was that students will by then have had a chance to become used to the use of microphones/digital recorders (Philp et al. 2010, p. 264), which were provided to the students for the whole period of the unit of work.

#### 4.3.2. Artefact collection

Artefact collection included student's pieces of writing and students' notes.

#### 4.3.3. Interviews

Interviews (see interview questions in Appendix A) with all participants were conducted mainly within the first two days after the last task had been completed. The aim of the interviews was to understand participants' feelings and perceptions of their interactions with an older/younger classmate over the whole period. Learning about learners' perceptions is especially important in this context because it is likely that perceptions of partner's age or/and proficiency will affect behaviour on tasks at hand, and as such impact on learning (Watanabe & Swain, 2007; Watanabe, 2008). It is also important as pairs under investigation are learners of different ages and proficiencies. For example, perceiving a partner as a novice with low abilities can result in dominant behaviour by the elder/more proficient learner and with the younger/less proficient learner taking a rather passive role (Watanabe & Swain, 2007; Watanabe, 2008). The transcriptions of the interviews were compared with the audio recordings of the interactions. As such, combining audio recordings and interviews achieved method triangulation and content validity. However, a detailed description of learners' perceptions is not possible due to space. Excerpts are included here as they provide some important insights into aspects of students' pair work, which may not be detectable from audio-recordings only.

#### 4.3.4. Tasks

Over a period of two and half months, students carried out a number of tasks. Some tasks were carried out during regular English lessons, which were taught by me. The main data for this study comes from the pedagogic tasks, which were completed by students themselves in the study time when I was not present. In order to achieve ecological validity, I used tasks and exercises provided in the text-book, which were a part of the 8<sup>th</sup> and 9<sup>th</sup> grade syllabus and were included in the 8<sup>th</sup> and 9<sup>th</sup> grade textbooks named Orange Line 4 and 5 (see appendix B for a description of tasks). It also has to be noted that some tasks implemented were not consistent with some general frameworks of task-based language teaching and learning (see for example, Bygate, 2016; Samuda & Bygate, 2008) according to which *a task* involves



*holistic language use*, achieves *one or more meaningful outcomes*, or is made up of *different phases*. In addition, most tasks and exercises used do by its own nature elicit focus on form, and trigger more deliberations about form than other tasks (Alegria de la Colina & García Mayo, 2007; Fernández Dobao, 2012; Nassaji & Jun Tian, 2010). For example, while the Comic, Text-reconstruction and grammatical exercises elicited a high number of LREs, the Looking for Help task elicited only a very few LREs.

#### 4.4. Data Analysis and Coding Procedures

Data was first segmented into on- and off-task talk (Storch, 2001a). Only on-task talk, in which learners were engaged in the task was further analysed. However, episodes of off-task talk, during which learners are engaged in talk not relevant to the task, were also counted and considered in further stages of analysis. For example, a high occurrence of off-task is indicative of students' low engagement with the task. This has an impact on pattern of interaction formed by pairs (see Storch, 2001a). Within the on-task talk, learners talked mainly about 1) the task at hand, 2) about language use and choices, and 3) about other task-related content such as about main characters or events. Episodes in which learners talked about how to go about completing the task at hand, negotiated or assigned roles, announced or negotiated the next stage in the task (Storch, 2001a) are referred as *task related episodes* (TREs). Excerpt 1 provides an example of a TRE from the data, in which one learner helps the other to understand the task by checking on her understanding of it and then by inviting her to speak English. Words and sentences in italics included in square brackets are translations from learners' L1 German.

Excerpt 1:

Li: [So, now we've done the first task and now we're going to do the next one. I'm going to read it.] What makes a person friend for you? What qualities are important?

Li: [What does it mean, Leni?] (saying as a teacher).

Le: [Well, what a friend is to you]. (overlap).

Li: [Exactly!] (saying as a teacher) [What is important to you?]

Li: [Shall we speak in English?]

Le: [Yes, I think so.]

Episodes, during which learners talked about language use and their choices are referred as *language related episodes* (LREs; Swain & Lapkin, 1998). LREs were coded on the basis of Swain and Lapkin's (1998, p. 326) definition as "any part of a dialogue where language learners talk about the language they are producing, question their language use, or correct themselves or others." Each LRE begins when a student first proposes or begins to discuss language or resolve a linguistic problem and ends when the discussion or resolution of the problem is complete (Davin & Donato, 2013). Excerpt 2 provides an example of a LRE from an interaction on the Comic task, in which learners transform a comic strip into a recount, by jointly changing the sentence *Sandy tells others that the mural looks great* into *Sandy told others that the mural looked great*. Lara reads a sentence (turn 36). Ella immediately provides the past simple form (turn 37). This is acknowledged by Lara (turn 38). Lara uses her resources to explain that *look* is not an irregular verb (turn 39). The correct verb form is then immediately completed by Ella (turn 40).

Excerpt 2

36 L: *Sandy tells others ...*

37 E: *told!*

38 L: *ja. [yes]*

39 L: *na ja look ist kein unregelmäßiges [well, look is not an irregular verb]*

40 E: *also looked*

41 L: *looked (repeats and writes the sentence down)*

42 L: *Sandy told others that the mural ... (saying while writing the sentence down).*

43 E: *looked great*

The analysis with regards to RQ2 considered the extent of correct resolution of LREs. Excerpt 2 above provides an example of a LRE, which was resolved correctly. However, LREs were also resolved incorrectly (Excerpt 3) or remained unresolved (Excerpt 4).

Excerpt 3. Incorrectly resolved LRE.

J: *What happened to our work! What a mess? Maybe I can fix it. (reading)*

G: *Was ist mit unserer Arbeit passiert? (translating)*

J: *Was für ein? [What a....?]*

G: *Müllhaufen? [rubbish heap]*

J: *Nein, das ist ein Malheur. [No, that's a mishap.]*

G: *Bist du sicher? [Are you sure?]*

J: *Ja, was für ein Malheur! [Yes, what a mishap!]*

Excerpt 4. Unresolved LRE.

Le: *break up ...continue... was ist denn das? [What is that?]*

Lu: *keine Ahnung. weiter. [No idea. Let's move on!]*

Episodes, during which learners perform the task but do not talk about task or about language use are referred to as *content related episodes* (CRE). In these episodes, learners for example talk about characters, events etc. Excerpt 5 provides an example of a CRE from the data. John (grade 9) and Will (grade 7) talk about what they do in their free time. As the excerpt reveals, they talk about the content of the task, i.e. perform the task, without deliberating about the task itself, or about their language choices.

Excerpt 5

J: *Why do you go swimming in the summer?*

W: *Because it's beautiful when you can diving or swimming or jumping and it's better than when you play computer or handy.*

J: *What do you do? ...What of the three things that you say is the best?*

W: *I found that diving is better that all...*

The three mentioned types of episode (TREs, LREs and CREs) were used as units of analysis for the investigation of patterns of interaction (RQ1). The occurrence and resolution of LREs were investigated separately as RQ2. In the next stage of the analysis, the number of conversational turns (see Table 4) was measured in order to support the analysis of patterns of interaction (RQ1). In addition, with regards the analysis of engagement with LREs, the LREs /conversational turns ratio was established (see Table 4).

#### 4.4.1. Coding and Analysis of Patterns of Interaction

Storch's framework was used to classify the patterns of interaction found among M-A pairs. Storch (2002) identified four patterns of interaction, namely collaborative/dominant-dominant/dominant-passive/expert-novice (see Table 2 below). These categories were imposed on the data and further

analysed. During this step, each episode (TRE, LRE, TCE) was reviewed and assigned to one of the above mentioned patterns of interaction. Adopted from Storch (2002), the patterns of interaction were coded for the following traits proposed by Storch: 1) *pattern of contribution* 2) *decision-making behaviour* 3) *nature of assistance* 4) *discourse and linguistic features*. The rationale for looking at these traits in particular is that according to Storch (2002), they are indicators of the extent of mutuality and equality among learners, and of collaboration. Equality refers to an equal extent of control over the direction of a task. Mutuality is high when both learners frequently engage with each other's contributions, providing a rich reciprocal feedback and sharing ideas (Damon & Phelps, 1989, p.13). Moderate to high equality and mutuality indicates that a collaborative pattern of interaction is established (Storch, 2002). A description of traits in order to determine equality and mutuality, and examples from the data are provided in Appendix C.

Table 2.  
Patterns of Interaction

<i>Collaborative</i>	Learners' engagement is moderate to high equality and moderate to high mutuality. Learners display willingness to offer and engage with each other's ideas, they create and maintain "joint problem space". Learners offer and discuss, which lead to resolutions acceptable to both partners (Storch, 2002, p.128)
<i>Dominant/dominant</i>	Learners display moderate to high equality, but a moderate to low level of mutuality. Although both learners may equally contribute to the task, they are not willing or unable to fully engage with each other's contribution.
<i>Dominant/passive</i>	Learners show low level of mutuality and equality. The dominant partner leads the task with little negotiation with the other passive partner, who cannot or does not contribute to the task or challenges the other.
<i>Expert/novice</i>	The level of equality may be moderate to low but the level of mutuality ranges from moderate to high. Differs from dominant/dominant in terms of the willingness of the expert to actively encourage the novice to participate in the task.

#### 4.4.2. Coding and Analysis of Interviews

The transcripts of *interviews* were analysed. Transcribed talk of the interviews was analysed for the following categories adapted from Watanabe's (2008) study, which examined interaction between L2 learners of different proficiency levels and their perceptions and feelings about their interaction.

- (1) *Overall perceptions about the pair interactions*
- (2) *Perceptions towards the degree of contribution*
- (3) *Perceived learning outcomes*

The insights gained from interviews are included here to complement the analysis of patterns of interaction.

#### 4.4.3. Inter-rater Reliability – Double Coding

The second rater took part in two training sessions with me. We reached a consensus in 92% instances. Our disagreements were related to the level of collaboration within two pairs. The second rater

tended to ascribe these pairs to dominant/dominant pattern because it seemed to him to be of low equality and mutuality.

## 5. Findings

*RQ1: What patterns of interaction can be found among mixed-age pairs of German learners of English as a foreign language at an alternative secondary school?*

First, a broad description of what typifies the broad range over time and across tasks is provided. Subsequently, an in-depth analysis illustrates the patterns of interaction found among M-A pairs. Where applicable, the difficulties to apply Storch's framework to M-A pairs are addressed.

### 5.1. Overall Findings

As shown in Table 3, the same patterns of interactions Storch (2002) identified in adult and university ESL classrooms were found in nine out of ten interactions of the M-A pairs in this study. The most common patterns were the expert-novice and the collaborative patterns of interaction, occurring four times each. One pair formed expert/passive pattern of interaction, which was not identified in Storch's study. It had been anticipated that when elder (more proficient learner) and younger (supposedly proficient learner) work together to solve linguistic problems, their interactions would likely form unequal relationships such as expert/novice or dominant/passive patterns of interaction (Storch, 2002). These expectations were met only to a certain degree as five out of ten pairs formed an unequal relationship exemplified in the expert/novice and expert/passive pattern (Watanabe & Swain, 2007), but a dominant/passive pattern was not found. Within three out of four expert/novice pairs, the elder student was simultaneously the more proficient one. Within one expert/novice pair (6) it was the younger but more proficient learner who took on the role of an 'expert' and guided her elder partner through tasks (see Excerpt 1). Although this example is not typical for the data, it clearly illustrates that even younger learners can take on a role of an 'expert'. What is more, this role was accepted and valued by the elder partner.

Rather surprisingly, five out of ten pairs formed equal relationships, namely collaborative (four pairs) and dominant/dominant (one pair). There seemed to have been substantial qualitative differences between pairs labelled as collaborative. In other words, on the 'scale' from collaborative to non-collaborative (Storch, 2001b), two pairs (9, 10) were closer to collaborative than the other two (pairs 3, 8). What is more, some interactions contained traces of more than one pattern of interaction within the same interaction (see also Galaczi, 2008 for the notion of "blend"), and patterns seemed to have varied depending on the linguistic demands of the task the students performed.

Table 3.  
Patterns of Interaction Across Tasks and Exercises

Pair (Patterns of interaction)	Pair (Patterns of interaction)
1. Lara & Ella (dominant/dominant)	6. Lilliana & Leni (expert/novice)
2. Emilia & Stella (expert/novice)	7. Riki & Lyn (expert/passive)
3. Irena & Sara (collaborative)	8. Gussi/Jossi (collaborative)
4. John & Will (expert/novice)	9. Lenka/Lucy (collaborative)
5. Lea & Jess (expert/novice)	10. Alena/Enna (collaborative)

## 5.2. Findings of the In-depth Analysis

This section illustrates each of the patterns found in the interactions across tasks and exercises.

### 5.2.1. Expert/novice Pattern

Four out of ten pairs formed expert/novice pattern of interaction. The excerpt below (10) can be said to be typical for the expert/novice pattern found in the data set, and was selected to demonstrate typical experiences seen in the data. It comes from the interaction of John (9<sup>th</sup> grader) and Will (7<sup>th</sup> grader), two high achieving and motivated students, discussing the objectives of a discussion task and subsequently performing it.

*Pair 4 - John (9<sup>th</sup> grade, high proficiency) and Will (7<sup>th</sup> grade, high proficiency)*

Excerpt 10

1 J: *So agree with your partner on one of the photos. Imagine that you...(reading the task)*

2 J: *[Ok. Will. So we should look at one picture and then imagine that we are one of the people, and then we should ask one another why we do it.] (explaining and inviting into a joint pursuit of the task)*

3 J: *[Which one are we going to take?]*

4 W: *Well, swimming.*

5 J: *Swimming? (confirmation check)*

6 W: *Yes.*

7 J: *[Ok. So, ich werde dich fragen. So...]*

8 W: *Yes.*

9 J: *Why do you go swimming in the summer?*

10 W: *Because it's beautiful when you can diving or swimming or jumping and it's better than when you play computer or handy.*

As we can see, John controls and directs the task. He reads the task to Will (turn 1) and provides him with an explanation of the task objective (turn 2). He then asks Will about his preference (turn 3). Later he suggests that he will start by asking him (turn 7) and encourages him to answer his question (turn 9). John actively encourages Will to participate in the task, which is linguistically demanding for Will. Not only does Will provide him with sufficient time to answer, but also prompts him to say more. The discourse is marked with frequent explanations, suggestions and questions in the form of requests for confirmation or explanations. Assistance is provided predominantly by John ('expert') but is accepted by Will. The discourse is also marked with a frequent use of the pronoun *we* (turns 2, 3), which in this particular context indicates John's willingness to offer and engage Will in the task and to create and maintain space, in which ideas could be discussed. These discussions then lead to resolutions acceptable to both of them. We can see that although John has a higher degree of control over the direction of the task, and it is rather Will who takes directions from John, both learners seem to contribute equally to the task. It follows that the interaction is moderate on equality. Both learners engage with each other's contributions, share ideas and are responsive to each other's suggestions. In other words, the interaction is high on mutuality. In fact, on the interviews (excerpt 11) both learners pointed out the advantage of pair work as in pair work learners are more likely to arrive at a correct solution.

Excerpt 11 (translation from German)

*W: When you do a task, there are usually two different opinions, and it is therefore possible to be more sure... so two opinions are more definite... When you are alone, you only have one opinion and you think that you are right. (Interview with Will)*

### 5.2.2. Collaborative Pattern

Four pairs formed a collaborative pattern of interaction. However, as mentioned above the level of collaboration differed among pairs. In fact, Storch (2001b) has suggested that the level of collaboration may differ across pairs and tasks. Therefore, the first excerpt (12) illustrates an example of a relatively high level of collaboration (pair 10). The second excerpt (13) illustrates an example of collaboration with the least level of collaboration among collaborative pairs.

*Pair 10 – Alena (8<sup>th</sup> grade, high proficiency) and Enna (7<sup>th</sup> grade, high proficiency)*

The following excerpt (12) comes from the pair talk of Alena, a high proficiency 8<sup>th</sup> grader and Enna, a high proficiency 7<sup>th</sup> grader. They are discussing the objectives of the Comic task.

Excerpt 12

10 A: *[Are we supposed to write what we have understood?]*

11 E: *[No, we are supposed to write it as a story.]*

12 A: *[I'm going to write now. In English or in German? Shall we write it in German first and then translate it?]*

13 E: *[Good idea. So, let's write in German first.]*

As excerpt 12 shows, the discourse is characterized by agreement seeking behaviour. Both learners are willing to engage with each other's ideas as indicated by the frequent use of the first person plural (turns 10, 11, 12, 13), suggestions (turn 13), explanation requests (turns 10, 12) and explanations (turn 11). They talk and listen to each other in a friendly tone, and even praise each other's contributions (turn 13), which indicates high mutuality and equality. As reflected in interviews and my knowledge as a teacher, one possible explanation for this behaviour is that both learners are very good friends who often work on assignments together. In addition, the difference in their English relative proficiency is small.

*Pair 8 - Gussi (8<sup>th</sup> grade, high proficiency) and Jossi (7<sup>th</sup> grader, high proficiency)*

The following excerpt (13) illustrates an example of the least level of collaboration among pairs. It comes from the pair talk of Gussi, a high proficiency 8<sup>th</sup> grader and Jose, a high proficiency 7<sup>th</sup> grader, translating the text of the Comic task.

Excerpt 13

1 J: *Ok. It wasn't easy to plan the mural but on Sunday they started to work. (reading the first sentence in English, as if he was recruiting G.'s interest in the task as G. is involved in off-task behaviour with another student)*

2 G: *Saturday.*

3 J: *On Saturday.*

4 G: *Es war nicht einfach das für die zu planen. Doch am Samstag geht's mit der Arbeit los (translating from English).*

5 J: *I have a date. I nearly forgot. (reading)*

6 J: *Ich hatte ein Date. [I had a date.] (translating)*

7 G: *Nein, ich habe. [No, I have.] (correcting)*

8 J: *Nein ich habe... [No, I have.] (correcting)*

9 G: *Doch das habe ich vergessen, oder so.* [Yes, I have forgotten or something like that.] (contra-suggestion)

10 J: *Doch das habe ich...* [Yes, I have...] (insisting on his solution)

11 G: *Ne, der hat es ja vergessen!* [No, he has forgotten it!]... maybe because he has no time now for this  
Graffiti. (correcting in an argumentative tone and explaining)

12 J, G: *The blue colour was a great idea Fetch.* (overlap, reading)

13 J, G: *Diese blaue Farbe war eine gute Idee, Zach.* (jointly translating the previous sentence) ... laughter

As excerpt 13 shows, both learners contribute to the translation, displaying an equally high degree of control and authority over the task and its direction. However, despite being the younger student in the pair, already at the beginning of the task Jossi has to recruit Gussi's interest in the task as he is involved in off-task talk with another student (turn 1). In fact, as the task progresses, Jossi's direction and control of the task increases to the extent that equals that of Gussi's. High equality is also indicated by similar distribution of turns, and by many overlaps (turns 10, 12). However, although both learners engage with each other's suggestions they do so predominantly by very explicit other-corrections (turns 3, 7, 9), and by offering counter suggestions (6, 8, 10) without providing any justification.

We can see that there is some difficulty to apply Storch's framework. For example, interactions of this pair showed little evidence of first person plural. According to Storch's framework, this would imply that both learners lack a joint ownership of the task, suggesting that the pair is low on mutuality and can only be matched with the dominant/dominant or dominant/passive patterns of interaction. However, as seen in the analysis, both learners often exchanged views and opinions about the task and language while using the first person singular (e.g., I think, war nicht sehr beeindruckt [translating *wasn't very impressed*]). Moreover, both learners frequently challenged one another engaging in disagreements which were sometimes uttered in an argumentative tone (e.g., *No, he has forgotten it!*), which were not necessarily resolved. In addition, despite the lack of explicit requests, questions, suggestions and little evidence of the first person plural, which according to Storch would suggest that their interaction is low on mutuality, they seemed to have enjoyed all tasks, spent a relatively long time on them, listened to each other, joked about the language, laughed about each other's utterances while experimenting with a new language. This suggests that their discourse was high on mutuality, and therefore collaborative. In addition to this, they produced lengthy LREs and their LRE/conversational turn ratio was high. Finally, they produced a relatively high number of co-constructions, which according to Storch (2001a) indicates mutuality and collaboration (see also Donato, 1994). Based on Storch's framework, this pair could be classified as dominant/dominant but a closer examination of other contextual aspects of their interactions which are not included in Storch's description is more likely to result in classifying this pattern of interaction as collaborative.

### 5.2.3. Dominant/Dominant Pattern

*Pair 1 - Lara (9<sup>th</sup> grader, high proficiency) and Ella (8<sup>th</sup> grader, high proficiency)*

One pair formed dominant/dominant relationship, although there was a difficulty to identify this pair as such. The next excerpt (14) exemplifies this. It comes from an interaction between best friends Lara and Ella interacting on the Comic task. They are attempting to rewrite the Comic as a story in past simple.

Excerpt 14

101 Lara: *came, come, came* (self-repetition)

102 Lara: *came to the date, his girlfriend* (while writing)

103 Ella: [But you should put a period here!] (suggesting to Lara in a friendly tone)

104 Lara: [Why is that?] (argumentative tone)

105 Ella: *To the date.*

106 Lara: *No...His girlfriend was angry... (argumentative tone)*

107 Ella: *angry because he was late (sounding disappointed)*

108 Lara: *angry about about his "spätkommen" [being late] (not paying attention to Ella's previous utterance)*

109 Ella: *because he was late (argumentative tone)*

The interaction begins by Lara self-repeating, and writing down what she believes is the right solution of the problem without seeking Ella's agreement about the solution (turns 101, 102). This indicates that she is not willing to involve Ella in the joint composition of the text and shows limited willingness to engage with Ella's suggestions (turns 103, 107) or seek a joint resolution. Lara does not even seem to take Ella's utterances into consideration (turn 108) and barely interacts with her. What is more, she responds in an argumentative tone of voice to Ella's suggestion. However, the argumentative tone of voice is also used by Ella (turn 109), which seems to be a natural reaction to Lara's behavior. Ella insists that her previous utterance (turn 107) was correct. She seems to be disappointed that Lara is either disrespecting her linguistic resources (turn 104) or not aware of her contribution (turn, 108). Although both learners are involved in the decision making process, this process is characterized by arguments, disagreements and difficulty in reaching consensus (Storch, 2001a, p.279). Although Lara displays a higher degree of control and authority over the task and its direction than Ella, Ella is willing to contribute and in fact contributes to the task. She has the linguistic resources to do so, and refuses to take a passive role. She tries hard to keep up with Lara and contributes to the task in her own way. In other words, although Lara dominates the task and barely interacts with Ella, Ella is not passive and shows some willingness to interact. Although Lara's behavior is dominant throughout the whole task and her role is set firmly from the beginning of the task, Ella's dominant behavior seems to be an attempt to resist Lara's domination (Storch, 2001a). And because Ella's contribution to the task is almost as equal as Lara's it can be said that the level of equality ranges between moderate and high.

If matched with Storch's framework, one would be drawn to conclude that the level of mutuality of this pair is low. However, as the excerpt shows, their frequent disagreements may not necessarily imply low involvement with each other's contributions, and therefore low mutuality. In fact, they often challenge one another as they grapple with new language. On the other hand, it is evident that Lara often seems to lack responsiveness to Ella's utterances, which seems to be an indication of low mutuality. In contrast to the above described collaborative pair, Lara's behaviour is dominant throughout all tasks. Although Ella's dominance is most likely a response to Lara's domination, her behaviour is dominant, too. Therefore, I opted to identify this pair as dominant/dominant, although it needs to be recognized that there is a certain level of ambiguity in this identification. Interestingly, Lara's dominant behaviour, which was similar across all tasks, is rather surprising as both peers have been best friends for many years, have often worked together on various assignments, and the proficiency difference between them is relatively small. Surprisingly, during the interview, Ella said that she enjoyed working with Lara. Ella also admitted that when working with other same-age or younger learners, she tends to take on the role of the scribe and dominate the task. In other words, her behaviour resembles that of Lara during their interactions. The fact that despite being best friends the level of their interaction being rather low on mutuality seems to suggest that friendship may not necessarily imply high mutuality. In fact, it may contradict it. However, we need research that would explore the role of friendship in peer assistance and patterns of interaction (see e.g. Hartup, 1996; Kutnick & Kington, 2005).

### 5.2.3. *Expert/Passive Pattern*



One pair did not correspond to any of the patterns of interactions proposed by Storch. The term expert/passive used by Watanabe and Swain (2007) was chosen instead. Watanabe and Swain (2007, p.134) explain that in the expert/passive pattern of interaction the less proficient passive learner's involvement in the task decreases over time despite the ongoing encouragement of the more proficient partner. What is more, the passive learner may become intimidated and/or reluctant to say anything in front of his/her expert partner.

*Pair 7 – Riki (8<sup>th</sup> grader, average proficiency) and Lyn (7<sup>th</sup> grader, low proficiency)*

The next excerpt (15) provides an example of an interaction between Riki, an average proficiency 8<sup>th</sup> grader and Lyn, a low proficiency 7<sup>th</sup> grader on a grammatical exercise, which was targeted to deepen their knowledge of *present perfect*. Students had to decide whether the temporal words are related to *present perfect* or *past simple*. As the excerpt reveals, Riki shows willingness to encourage Lyn to participate in the task. Riki assists Lyn by providing explanations (turn 1), by inviting her to produce an utterance (turns 3, 5, 7), by providing implicit feedback via rising intonation, which indicates that Riki's utterance may not be correct (turn 9), and by translating the target words into L1 with the follow-up question (turn 11). However, Riki's replies are merely limited to short replies, or guesses without any reasoning for her choices (turns 4, 8, 10, 12). The only exception is seen in turn six, where she provides some reasoning for her choice.

Excerpt 15

1 R: [So, the first exercise is, what is finished and what is not finished, yet]

2 L: Ok

3 R: [So] two days ago? (checking understanding)

4 L: [is not finished, yet]

5 R: Two days ago (stress on ago) ago... war [was]...

6 L: waren [was, so it is finished]

7 R: [So, ok. always, finished or not?] (checking understanding)

8 L: [finished] (only guessing)

9 R: always [finished?] (checking again)

10 L: [No] (guessing, not giving a reason)

11 R: [so this year] (translating for her)... [Is it in the past?]

12 L: [not finished]

(from now on L. doesn't say much and tends to merely write down what R. says)

Despite being a hardworking and a responsible student, Lyn simply lacks the linguistic resources to engage with Riki's contributions and to contribute to the task. At the same time, Riki does not seem to be capable of providing the necessary assistance for Lyn in order for her to participate more. As a result, the interaction is low on both, equality and mutuality, and would thus match the dominant/passive pattern. However, Riki's behavior is not dominant. She is actually willing to help Lyn to participate more but she simply has no other choice than complete the task without Lyn. Therefore, expert/passive was chosen over dominant/passive (Watanabe & Swain, 2007, p.134). The expert/passive relationship in Watanabe and Swain's (2007) study was established because the low proficiency learner in the pair was intimidated and reluctant to say anything when interacting with an expert partner. However, the reason for Lyn's low participation does not seem to be her intimidation as both learners have been acquaintances since the first grade, and have often interacted on language and other tasks ever since. In fact, both are fully aware of each other's language resources. On post-task interviews, Riki (grade 8), the elder partner of Lyn (grade 7) expressed her preference for working with someone better at English than Lyn. She felt that together they could not complete the tasks, and that their interactions could not produce any learning

outcomes. It can be said that Riki only confirmed what was obvious from the audio-recordings. Lyn acknowledged that she finds English difficult and that the tasks she worked on with Riki were too difficult for her. Riki also pointed out that although she tries to help Lyn, such as by providing her with explanations, Lyn does not seem to benefit from her help. Consequently, Riki has to complete the tasks on her own.

Excerpt 16 (Translated from German)

R: *Well, it is difficult then. It is difficult for both, because I explain it then to Lyn, and she cannot do it anyway, that is why I do it. (Interview with Riki)*

RQ2: *To what extent do secondary school mixed-age groups/pairs engage and resolve LREs during their collaborative dialogue?*

### 5.3. Engagement with LREs

LREs were the most frequent episodes that pairs engaged in during the four tasks and exercises (the Comic, the Text-reconstruction, Looking for help and grammatical exercises). Table 4 demonstrates the level of engagement with LREs within the individual interactions, and its comparison to other episodes engaged by pairs. It shows that across four tasks learners engaged in 433 LREs (Language related episodes), in 88 TREs (Task related episodes) and in 107 CREs (Content related episodes). It has to be noted that there were differences in distribution of LREs and CREs across tasks and exercises, which is to be mainly attributed to the nature of the tasks, whether they elicited linguistic forms or not.

Table 4

Engagement with LREs/ TREs/ CREs /Ratio LRE turns/conversational turns across tasks

Pair	PI	RP	LRE	TRE	CRE	LRE/conv.	Ratio
Emilia9/Stella7	exp/nov	A/A	64	5	10	575/728	0.79
John9/Will7	exp/nov	H/H	9	4	12	61/162	0.37
Lilliana 7/Leni8	exp/nov	H/A	53	7	9	370/447	0.83
Lea9/Jess8	exp/nov	H/A	35	8	22	218/356	0.61
Gussi8/Jossi7	collab	H/H	60	12	15	241/380	0.63
Lenka8/Lucy7	collab	A/A	48	8	8	300/453	0.66
Irena8/Sara7	collab	A/A	30	12	7	203/292	0.69
Alena8/Enna7	collab	H/H	53	9	8	267/359	0.74
Riki8/Lyn7	exp/pass	A/L	24	4	8	77/120	0.64
Lara9/Ella8	dom/dom	H/H	57	9	14	381/501	0.76
N			433	88	107		
M			43.3	8.8	10.7		
Range			9-64	4-15	8-22		

PI – Pattern of Interaction, RP – Relative Proficiency, LRE – Language Related Episode, TRE – Task Related Episode, CRE – Content Related Episode, LRE/conv – LRE turn/conversational turn, Ratio - LRE turn/conversational turn

When looking at the distribution of episodes across pairs, nine out of ten pairs engaged in more LREs than in TREs and CREs. In other words, the majority of pairs discussed linguistic forms elicited by

the tasks more frequently than the aspects of the tasks and of the task content. In addition, the majority of pairs tended to discuss the content of the task (CREs) more than the aspects of the task (TREs). In other words, they could have been more concerned about the content of the task rather than about the task and about how to approach it. One possible explanation is that these pairs were able to work out the goal of the tasks relatively easily, and could invest their resources towards the content of the task and the language it elicits. Table 4 also reveals great variations in the LREs produced across pairs ranging from 9 to 64, the average score (M) 43.3 and the median being 48. Surprisingly, even pairs that formed the dominant/dominant (Lara/Ella) and the collaborative pattern with the least level of collaboration (Gussi/Jossi) produced nearly the highest number of LREs across four tasks. They also produced TREs and CREs.

However, because pairs approached tasks in different ways, and thus needed a different amount of time to complete the tasks, simply counting the number of LREs may not reveal the actual extent of engagement with LREs. Therefore, I counted the conversational turns produced by all pairs, and the number of LRE turns within these conversational turns. Table 4 above demonstrates the LRE turn/conversational turn ratio. It shows that with the exception of John/Will, pairs frequently engaged in LREs, which suggests that a high level of engagement with LREs within mixed-age pairs took place, despite the differences in age and language abilities.

#### 5.4. Resolution of LREs

Figure 1 and Table 5 indicate how many LREs were correctly resolved, incorrectly resolved, or left unresolved.

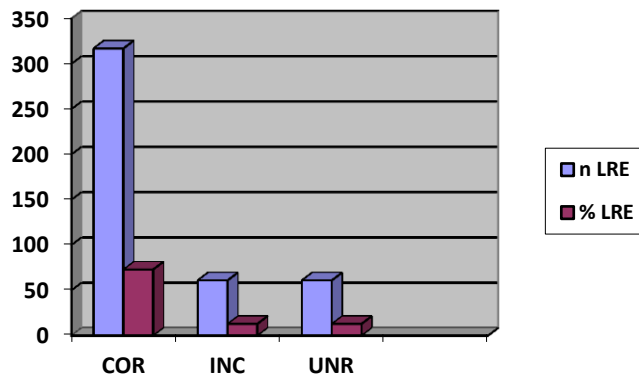


Figure 1. Total number of correctly (COR) /incorrectly (INC) /unresolved (UNR) LREs

As shown in figure 2, 73% of LREs were resolved correctly, 13% were resolved incorrectly, and 13% were left unresolved.

Table 5

Correctly Resolved/Incorrectly Resolved/Unresolved LREs Across Pairs

Pair	PI	RP	COR	INC	UNR
Emilia9/Stella7	exp/nov	A/A	72%	19%	9%

John9/Will7	exp/nov	H/H	67%	11%	22%
Lilliana 7/Leni8	exp/nov	H/A	91%	5%	4%
Lea9/Jess8	exp/nov	H/A	83%	0%	17%
Gussi8/Jossi7	collab	H/H	83%	3%	13%
Lenka8/Lucy7	collab	A/A	50%	25%	25%
Irena8/Sara7	collab	A/A	63%	17%	20%
Alena8/Enna7	collab	H/H	75%	8%	
Riki8/Lyn7	exp/pass	A/L	67%	33%	0%
Lara9/Ella8	dom/dom	H/H	58%	25%	18%
N			317	58	58
Percentage			73	13	13
M			31.7	5.8	5.8
Range			6-64	0-14	0-12

PI – Pattern of Interaction, RP – Relative Proficiency, COR – Correctly Resolved LREs, INC- Incorrectly Resolved LREs, UNR – Unresolved LREs

As shown in Table 5, LREs tended to be resolved correctly across pairs regardless of patterns of interaction. All pairs resolved 50% or more LREs correctly with the range being (6-64, i.e. 50% to 91%). However, most pairs left a number of LREs unresolved (range from 0-12, i.e. 0% to 25%) or resolved incorrectly (range 0-12, i.e. 0% to 33%).

## 6. Discussion

The analysis of patterns of interaction has confirmed the importance of taking students' relationships into account when investigating pair work, and its contribution to learning (Dao & McDonough, 2017; Galaczi, 2008; Choi & Iwashita, 2016; Li & Zhu, 2013; 2017; Storch, 2001a; 2002; Storch & Aldossari, 2013; Watanabe & Swain, 2007). In particular, analyzing patterns of interaction from the point of view of their quality of engagement in terms of equality and mutuality (Damon & Phelps, 1989) has proved to be useful to understand the role of relationship in peer interaction. It had been expected that pairs where partners are composed of different ages and proficiencies, would form unequal relationships such as expert/novice or dominant/passive. The analysis has shown that this expectation has been met only to a certain extent as only five out of ten pairs formed unequal relationships. Four of ten pairs formed expert/novice, and one pair formed expert/passive relationships. Surprisingly, the remaining five pairs build equal relationships, among which four were collaborative, and one was dominant/dominant.

Recent studies on peer interaction suggest that it may not be proficiency differences that are the main moderating factors of collaborative work, but the relationship between pair members (Dao & McDonough, 2017; Philp, Adams & Iwashita, 2014; Storch, 2002; Storch & Aldosari, 2013; Watanabe & Swain, 2007). However, in line with some studies (Kim & McDonough, 2008; Leeser, 2004), the findings suggest that proficiency differences may impact on the formation of patterns of interaction. Pairs, where the proficiency gap was large formed either expert/novice or expert/passive pattern of interaction. Similar proficiency learners formed either collaborative or dominant/dominant relationship.

Rikki and Lyn's case (expert/passive) has shown us that low proficiency students may indeed be afraid to contribute to the task (Kowal & Swain, 1994), and/or try to save their face without causing one

another embarrassment (Philp & Tognini, 2009). Surprisingly, this may occur despite a good relationship between both students, and despite the 'expert' partner's willingness to engage the 'novice'. In fact, Leeser (2004) cautioned that if the proficiency gap between both learners is too large, low proficiency learners may not be able to benefit from interactive work with a more proficient partner, as they may lack developmental readiness to engage in discussions about some linguistic problems. This may also hinder the task completion (Ellis, 2003). Importantly, the case of Riki and Lyn suggests that heterogeneous grouping/pairing does not as a matter of fact imply effective peer assistance. Sato and Ballinger (2016) have argued that it is a false promise unless teachers carefully prepare students for and carefully structure the activity (see also Yong & Teddick, 2016). This suggests the importance of supporting learners' interaction with one another so that they learn to engage with one another in ways that are conducive to learning.

Furthermore, research (Storch, 2002; Storch & Aldosari, 2013; Watanabe & Swain, 2007) has suggested that only expert/novice and collaborative patterns of interaction are the most conducive to learning such as by offering opportunities for practice or focus on language use. It follows that eight out of ten pairs in the current study have formed relationships, which might promote learning. In addition, in the case of nine out of ten interactions, elder or high proficient learners did not seem to dominate the interaction or accomplished the large part of the work. What is more, they were willing to engage their younger/less knowledgeable partner. The analysis of LREs has shown that the majority of pairs frequently engaged with LREs, which indicates that their interactions afforded a high number of opportunities for learning. However, in contrast to Storch's findings, the analysis of LREs has shown that even pairs that formed expert/passive, dominant/dominant and the least collaborative pattern of interaction, engaged in LREs. In particular, Lara/Ella, classified as dominant/dominant frequently engaged in LREs and resolved many of them correctly. On the other hand, one pair that formed an expert/novice pattern engaged with LREs only scarcely. These findings run counter Storch's (2002) assertion that collaborative nature of peer interaction is a necessary condition for L2 learning. However, due to the small number of pairs in this study, future research needs to verify this. Another limitation of the current study is that it did not empirically evaluate L2 learning and development as a result of M-A pair work. The analysis of LREs has also shown that while the majority of LREs were correctly resolved, a relatively high proportion of them remained either unresolved or incorrectly resolved. This suggests that we should not assume that the elder or higher ability students will as a matter of fact assist their younger or lower ability peers to resolve linguistic problems in a way that a teacher does, and that no additional teacher's assistance is required.

It had been expected that pairs, where partners are self-selected or pairs where relationship is at the level of very close friendship, would either form patterns other than dominant/dominant or dominant/passive. Only one pair (Lara/Ella) did not meet these expectations. This is important as it underlines the role of the relationship in pair work (Hartup, 1996; Kutnick & Kington, 2005). On the other hand, the case of Lara and Ella shows that the patterns of interaction learners form may not only depend on their relationship, but on their perceptions of their partner's L2 proficiency (Watanabe, 2008). One explanation for Lara's dominant behaviour may be that she perceived Ella's proficiency to be lower than hers. Moreover, the fact that Lara took on the role of a scribe may also have contributed to her dominance. In fact, research has shown that the effectiveness of pair/group work may depend on the roles assigned (Dao & McDonough, 2017; Samuda & Bygate, 2008; Willis & Willis, 2007). Importantly, the case of Lara and Ella suggests that best friends may not necessarily form a pattern of interaction which is high on mutuality. However, one of the limitations of this study is that any claims regarding friendship being an important factor contributing to interaction patterns cannot be made. This is because of the difficulty of identifying friendship as a variable which seems to be partly related to the construct itself. Moreover, the data are insufficient for this purpose. Future research could explore the role of friendship and the quality of friendship in patterns of interaction (see e.g. Hartup, 1996; Kutnick & Kington, 2005).

Finally, we have seen matching pairs with Storch's patterns of interaction was not clear-cut due to some level of ambiguity related to associated traits defined by Storch in order to determine equality and mutuality. For example, Storch (2001a) argues that the discourse within the dominant/dominant pattern of interaction is marked predominantly with the first person pronoun and the second person singular while the frequent use of the first person plural (e.g., *we*) is a sign of collaboration. However, the pronoun *we* as in "*We must use simple past here!*" can have a different connotation depending on the intention of the particular speaker. When uttered in a bossy way, it can be intended to embarrass or ridicule a partner. However, when uttered in a friendly tone, it can serve the function of clarifying or even inviting the partner into a joint pursuit of the task at hand. In fact, the analysis of excerpts revealed that it was not necessarily the discourse and linguistic features as such but the contextual aspect of a particular interaction and utterances that seemed to have been more suggestive of the level of equality or mutuality. For example, interactions between Lara-Ella were rich on disagreements with each other expressed via other-corrections (e.g., No...His girlfriend was angry! [argumentative tone] or requests for explanation (e.g., *Why is that?* [in argumentative tone]). These disagreements were also sometimes unresolved. Storch (2001a) claimed that this indicates a lack of a shared perspective of the task. This lack of shared perspective is according to her (see also Antón and DiCamilla, 1999) suggestive of low mutuality. However, despite Lara's lack of responsiveness to the propositional content of her partners' utterances, the analysis of excerpts showed that both learners spent a considerably long time on all tasks, worked together from the beginning to the end of the assigned task, produced a high ratio of LREs, a relatively high LRE turn/conversational turn ratio, and engaged in frequent co-constructions. These seem to be all figures associated with high mutuality and high equality.

Based on this reasoning, in addition to traits identified by Storch, such as *engagement with each other's contributions*, *reciprocal feedback* or *frequent sharing of ideas*, future studies could consider following traits in order to determine mutuality. *Challenging each other using disagreements* in the form of other-corrections or clarification requests may be indicative of mutuality as they suggest a joint pursuit of the task at hand. *Unresolved disagreements* do not necessarily imply low mutuality because lack of agreement does not mean that learners are not involved with each other's contributions. In contrast, *lack of responsiveness* to the other's utterance is most likely to create an interaction low on mutuality and should be treated as a sign of low mutuality. Future studies could also take into account measures such as *time on task*, *number of conversational turns*, *LREs/conversational turn ratio* and *number of co-constructions* in order to indicate the extent of equality and mutuality. Contextual aspects of utterances such as *laughter*, *off-task talk* as well as and the *tone* and the *function of utterances* may also be suggestive of the extent of mutuality and equality.

## 7. Conclusion

This study aimed at laying the foundations for future research of mixed-age peer interactions in language classrooms. Based on Storch's framework (2002), it has confirmed the importance of taking students' relationships into account when investigating pair work, and its contribution to learning. It has shown that M-A pairs are able to form relationships that are conducive to learning (Storch, 2002; Storch & Aldosari, 2013; Watanabe & Swain, 2007). They seem to be willing to offer and engage with each other's contributions and are able to contribute to the task work (Storch, 2002). It follows that teachers are likely to benefit from the implementation of mixed-age pair work.

An important finding of this study is that non-collaborative attitudes and patterns of behaviour among young adolescent learners may not necessarily imply limited opportunities for learning. This study has shown that despite unresolved disagreements, or even arguments, learners may still enjoy their interaction, they may spend long time on task, may even produce many co-constructions and frequently

engage in LREs. This is important as it contradicts Storch's (2002) claims that collaborative nature of peer interaction is a prerequisite for L2 learning. This study proposes that learning may not only occur in collaboration but also in interaction around disagreements, which do not have to be necessarily resolved (see also Philp, 2016). It suggests that there might be other factors related to students' perceptions of one another and the task at hand, the difficulty of the task as well as their personal histories and histories of their pair/group work that seem to affect the level of equality and mutuality, and therefore the nature of interaction.

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**Appendix A**  
**Interview questions (original in German)**

1. Tell me about pair work with .... What is it like working with him/her?  
How did you feel during pair work?
2. Tell me more. What was it like working with your partner for the unit of work?
3. Do you think the pair work went well? Why? Why not?
4. How do you think it worked?
5. How do you work together – is one of you the boss?
6. Did you help one another? How?
7. What do you like about working with your partner?
8. Anything you don 't like?
9. What kinds of things did you learn from pair work? What about in terms of English? What else? Anything else?
10. Did you like the activities? What did you like about them? Why not?
11. How did you contribute to the pair work?
12. How do you think your partner contributed?
13. Who do you think contributed more?
14. Would you prefer to work individually?
15. Would you prefer to do the task with a same age (same grade) partner? Why? Why not?
16. Do you think that you benefit from learning with older/younger partner? If so, how? If not, why not?
17. What is important for you when choosing a partner for your English assignment?
18. Who do you ask when you need help?

## **Appendix B**

### **A description of some tasks**

*Comic* – Students were asked to jointly read the comic and work out the meaning of the story. Then, they jointly completed a grammar exercise (pre-task phase) in order to practice the backshift of tenses before engaging in the main task. The main task was to write the comic as a story and read their story to the class. In the subsequent 45-minute lesson (post-task phase) learners were given a grammar exercise eliciting the same linguistic feature but used in a different context. They were asked to complete this exercise individually. This task took about 135 minutes (one 90-minute and one 45-minute lesson) to complete. These lessons were spread over two days. The first 90-minute lesson consisted of a pre-task and a task, which were completed jointly. The task elicited a targeted linguistic feature, namely back shifting from present simple into past simple in indirect reported speech.

*Text-reconstruction task (a cloze task)* - Students carried out this task towards the end of the unit. This task required student learners to jointly identify and fill in the missing targeted linguistic features. Later, they were asked to replace the identified features with different words. Research (Nassaji & Jun Tian, 2010) suggests that a cloze task promotes LREs as learners' attention is very much drawn to the blank space which is demanding missing words or text. The task took about 40 minutes to complete.

*Looking for help?* – Students carried out this task in the middle of the unit. They were asked to jointly read a text concerning a teenager looking for help and three replies of agony aunt or uncle who are online experts, providing a confidential advice and guidance. Then, they were asked to sum up the main text, determine the replies and talk about what they would do in a similar situation. The task took about 30 minutes to complete.

*Grammar exercises* – Students carried out these exercises throughout the unit. They jointly completed several grammatical exercises in order to practice and consolidate their knowledge of linguistic features such as *phrasal verbs* and *infinitive with/without to*. The exercises took about 45 minutes to complete.

## Appendix C

### A description of traits proposed by Storch (2001a) and examples from the data

1) *Pattern of contribution* – this category implies the extent of individual learner's contribution to the task and learners' willingness to offer and engage with each other's contributions. For example, in the collaborative pattern of interaction, the pattern of contribution is equal or one learner's contribution to the task is slightly higher. The more active learner may also seek involvement of the less active learner, contributing to involvement of both in all aspects of the task (see Excerpt 7 below). Within the expert/novice pattern, despite the expert's greater contribution, he/she encourages the 'novice' to contribute (see Excerpt 6 below). In contrast to this, in the dominant/dominant pattern, one learner contributes more controlling and directing the task while the other learner resists domination (Storch, 2001a).

*Excerpt 6 (translated from German)*

J: Ok. Will. So we should look at one picture and then imagine that we are one of the people and then one of us should ask the other one why one does it. Which are we going to take?

W: Well, swimming.

2) *Decision-making behaviour* – this category involves for example how agreements are sought, disagreements expressed, or whether learners' discussions lead to resolutions which are acceptable to both of them (Excerpt 7). For example, learners negotiate disagreements and reach consensus. In the dominant/passive pattern it is the dominant learner who makes the majority of decisions, with minimal or no involvement of the passive learner (Storch, 2001a, p.279).

*Excerpt 7 (translated from German)*

12 A: So, it was a beautiful day (laughter). Okay. I'm going to write now. In English or in German? Shall we write it in German first and then translate it?

13 E: Good idea. So, let's write in German first.

3) *Nature of assistance* – this category relates to the direction of assistance provided. For example, assistance in the collaborative pattern is provided either by learners in turn (see Excerpt 8) or can also be "co-constructed as collective resources of both learners are pooled and decisions reached" (Storch, 2001a, p.280). In contrast to this, in the dominant/dominant pattern, although assistance is provided or offered, it is rejected without much consideration (Storch, 2001).

*Excerpt 8 (translated from German)*

1 Le: space (referring to the word space which they are about to replace)

2 Lu: Can we also say other planets? (suggesting)

3 Le: Yes, that fits well. (saying and writing it down)

4) *Discourse and linguistic features* – this category involves occurrence of certain discourse moves and linguistic features. For example, the collaborative discourse is marked with a high occurrence of requests, questions, explanations, repetitions, instances of collaborative completions, simultaneous talk or use of phatic utterances (Storch, 2001a). Linguistic features include a high frequency of first-person plural pronouns such as *we*, *our*, or using *let's*, *could you?*, *do you think that?*, which are features indicative of mutuality and a joint ownership of the task (see Excerpt 9 below) (Storch, 2001a). On the other hand, predominance of first- and second-person pronouns indicates a non-collaborative pattern of interaction (Storch, 2001b).

*Excerpt 9*

A: **We** must make the next...

E: Task?

E: Read the sentence about the comic and tell the story. Jaden tells the gang...(reading the example)

A: Ok.

E: Also **we** must do this story and then **we** must ...do this comic and then **we** must tell the story.

E: Jaden told ne [no] told (self-correction) weil **wir** müssen Vergangenheit machen, oder? [*because we have to use past, right?*]