Lexical Development of German-Turkish bilinguals:
A comparative study in written discourse

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This longitudinal study presents the contrastive analyses of lexical development of Turkish-German bilinguals in written discourse in respect to lexical richness and diversity. In order to compare the different text lengths and the relation of types and tokens, as measurement methods, Guiraud (G) and Advanced Guiraud (AG) are used, which factor in age, genre, language and (Turkish) instruction and are proven with an analysis of variance (one way). Results show that lexical measures of diversity, word and text length are sensitive to age. Genre and Turkish instruction seems to play a limited role in lexical usage.

1. INTRODUCTION

This paper analyses the "Lexical Development of German-Turkish bilinguals: A comparative study in written discourse". This study is an empirical analysis of corpus data, which were collected through a cross-linguistic multilingual development study of trilingual 7th, 10th and 12th graders at a "Gymnasium", 'college preparatory' in Berlin[1]. Additionally, questionnaires are also included into the analysis to ascertain sociolinguistic background information of pupils.

Previous studies in lexical development and richness were mostly focused on monolinguals. In this field, only a few studies were based on bilinguals and the effect of Turkish instruction on the linguistic development of bilinguals. The focus of this longitudinal study is on the measurement problems of lexical richness and the lexical development of bilinguals in Germany with a Turkish migration background. This paper is based on one of the aspects of an ongoing project of later language development and multiliteracy in first, second and third languages (LLDM and MULTILIT). It aims to characterise the development of lexicon in L1 Turkish (mother tongue, usually the weaker in written language) and L2 German (usually the dominant written language) of second and third generation Turkish-German bilingual adolescents born of immigrant parents in Germany.[2] Furthermore, the correlations of Turkish instruction will be analysed as far as possible.

It has been shown in different studies that measuring the lexical richness and development is difficult for many reasons. There are various methods to measure lexical richness in spoken or written discourse. This study is a preliminary step to establish these methods with bilinguals within the frame of the LLDM and MULTILIT projects. We compare lexical diversity and text length in both languages in written discourse and in two genres (narrative and expository).

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1 The Project Later Language Development of Multilinguals (LLDM, 2007 - 2009, Free University of Berlin), was coordinated by Carol Pfaff and Mehmet Ali Akinci and funded by DAAD-PHC and the ongoing project Multiliteracy (MULTILIT 2010-2012, University of Potsdam & Free University of Berlin.) is coordinated by Christoph Schroeder and Mehmet Ali Akinci and funded by DFG-ANR.

2 The first study with the available data was based on L1 Turkish by Pfaff *et al.* (2010).

2. METHODOLOGY

Before introducing the methodology of this study we want to establish what lexical richness (LR)/ lexical diversity (LD) is. There are many different approaches for defining these items. As noted by McCarthy & Jarvis (2007), among others, LD is often used as an equivalent to lexical richness, lexical variation and vocabulary diversity. "Lexical diversity (LD) can be described as the range and the variety of vocabulary deployed in a text by either a speaker or a writer" (McCarthy & Jarvis 2007: 459). LD is relevant for a wide range of aspects, such as writing skills, vocabulary usage and lexical knowledge. It describes the quality of vocabulary content of the learner's output.

The indicators of the LR in a text are the amount of 'low frequency' words used, the relation between types and token, range of vocabulary and command of different semantic fields.

2.1. Measuring lexical richness

Lexical richness is a phenomenon that has been traditionally measured by a wide variety of different methods. The measurement of lexical diversity has been often calculated with so-called Type Token Ratio (TTR), which shows the ratio of different word types and the total text length of a spoken or written discourse. On the other hand, it has been criticised for its instability and sensitivity to text length (see Daller *et al*. 2003: 199f). "Thus, when TTR is used to compare any two texts, the longer text generally *appears* to be less diverse" (Mc Carthy & Jarvis 2007: 460, emphasis in original). Therefore, other methods have been tested and it has been proven that they are not producing reliable information about lexical diversity. Recently, *vocd* (vocabulary diversity), a computational measuring tool of CLAN (MacWhinney 2000), did not perform to the expectations of measuring lexical richness either (see McCarthy & Jarvis 2007 for a detailed discussion).

In this study, different text lengths will be compared, but TTR makes it difficult to examine texts with contrastive lengths, as it has been observed that the ratio between types and tokens decreases by increasing text lengths. We believe that the index of Guiraud (G)[3] could be a better measure than TTR and it "seems to be the most stable for language learner data" (Daller *et al*. 2003: 200). Jarvis (2002) stated that it is "designed to adjust [its] respective lexical indices in accordance with the length of the text, so that short and long texts are comparable."

According to Daller *et al.* (2003), besides the quantitative measurement, a qualitative measurement will also be added to the methods by including the analysis of basic and advanced vocabulary (advanced Guiraud (AG)[4]).

From a linguistic perspective, the problem is the definition of basic/advanced vocabulary. As stated in Arnaud (1984), basic vocabulary is considered to be a list of frequent words used at the college preparatory level. As noted by Daller *et al.* (2003: 201) and others, advanced vocabulary is uncommon and can be an indicator of higher language proficiency. Meara and Bell (2001) claim that "[p]eople with big vocabularies are more likely to use infrequent words than people with smaller vocabularies." Moreover, structural differences make this problem even more complicated (as in the present study Turkish vs. German). The methods will be adapted from those, which were investigated in the study of Daller *et al.* (2003). For German, a basic word list for German as a foreign language (Oehler 1992) and for Turkish, a vocabulary list, which was created by seven teachers of Turkish as a foreign language, will be used.[5]

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3 The index of Guiraud uses the square root for relating types and token: $G = types/\sqrt{token}$ (see Guiraud 1954).

4 $AG = advanced\ types/\sqrt{advanced\ token}$ (see Daller *et al*. 2003).

5 For the study of Daller *et al.* (2003) a group of seven teachers of Turkish as a foreign language were considered to be judges. They classified the given types of the study in basic and advanced vocabulary. Later,

2.2. Data collection

The procedures for data collection and the analysis of the study were adapted from those used in a major international cross-linguistic study of first language development of monolinguals carried out in seven countries by Berman and Verhoeven (2002, 2005, 2007) as summarised by C. Goldfus (2005), review of Berman (2004).

A video without dialogue about everyday problems between people at school was shown. There are sounds in the background, like a bell ringing, students laughing, etc. It takes place at a generic school with a class of pupils and teachers dressed in non-distinctive clothing. The video shows copying during a test, fighting during breaks or in the school yard, vandalism, ostracism and taking money dropped by a teacher.

The video is the basis for the data elicitation. The pupils were asked to produce oral and written texts in German, English and L1 (Turkish) in two modes (oral and written) and in two genres: narrative and expository. It was made clear that pupils should not retell the events in the film, but mention their personal experiences and general opinions parallel to the video.

The two text genres, expository and narrative, were chosen because they provide information on the students' language skills and are the most commonly found in school curricula, i.e. expository and narrative writing.

As stated in Pfaff (2009) all the participants were requested to complete questionnaires in German. The goal of the questionnaires was to gather information on individual language practices outside of school and other background information like regional, educational and occupational background of parents, where Turkish was learned, initial contact with L2 language, choice with interlocutors and cultural and literacy practices in L1, L2, L3. It also includes a self-rating of their proficiency in the languages they speak (for further discussion about questionnaires see Baker 2006).

3. THE STUDY: DEVELOPMENTAL COMPARISON OF LEXICON IN WRITTEN DISCOURSE IN TURKISH AND GERMAN OF BILINGUAL ADOLESCENTS

3.1. Participants

All the pupils were born in Berlin, in a multiethnic neighborhood[6] with a Turkish migration background. Their family language is Turkish (L1) and German is an (early) second language (L2) (for the further discussions see Pfaff 2009: 217). The target groups are 10th and 12th graders, attending regular classes in Berlin. We analysed a longitudinal sub-sample of narrative and expository written texts of seven pupils in Turkish and German: 10th & 12th grades (2008, 2010) from a Gymnasium in Berlin-Kreuzberg.

In the questionnaires, some children reported having had Turkish instruction. In some schools, Turkish is offered as an additional foreign language[7], but it often occurs outside of

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their judgments were checked against the basic list of Turkish (Tezcan 1988). This vocabulary list didn't include all the vocabulary that we found in our data. We used the list of words in the texts analyzed by Pfaff *et al.* (2010), which has been judged by two native speaker linguists Mehmet Ali Akinci and Seda Yilmaz.

6 Inner-city districts of Berlin – such as Kreuzberg, Neukölln or Wedding – have a large migrant population of mostly Middle-Eastern origin (Turkish, Arabic, Kurdish, and Persian). In Kreuzberg for example 84.4% of the pupils had a home language other than German. Sources: German Federal Office for Statistics, Microcensus 2005 on the population with a migrant background in Germany; German Federal Ministry of Internal Affairs, Report of the Independent Committee on Immigration; see also Wiese (2009).

7 In Germany, Turkish instruction differs according to the state, school system, and institution (Turkish Consulate or educational system). As a result Turkish is offered as afterschool classes as "Muttersprachlicher Unterricht" 'mother tongue instruction' (in elementary school) and "Ergänzungs- und Wahlpflichtunterricht" 'additional/supplement instruction', such as Turkish as a foreign language (secondary school). In order to get into a class of Turkish as a foreign language, pupils must have knowledge of Turkish at a certain language proficiency. Basically, it is intended for children, who have Turkish as a mother tongue, but it is also open to

the regular school curriculum, i.e. in after school classes (for discussion see Schroeder 2003). Furthermore, some of the pupils in this study take Turkish as a second foreign language. They all have had different Turkish instructions: Some take Turkish in an elementary school, some as a second foreign language in secondary school, while others did not have Turkish instruction (see table 1).

(Table 1)   *Background information of the pupils*

PSEUD	SEX	AGE 10th	AGE 12th	TR INSTR	PLACE OF BIRTH	PLACE OF RESI-DENCE	L1	First exposure to German
VED	m	15;08	17;08	No	Berlin	Kreuzberg	TR	Kindergarden
ASI	f	17;08	19;08	No	Berlin	Kreuzberg	TR	School
NES	f	16;04	18;04	No	Berlin	Kreuzberg	TR	School
SER	m	16;02	18;02	Elementary	Berlin	Treptow	TR	Family
ISM	m	16;01	18;01	Elementary	Berlin	Kreuzberg	TR	Family
HAC	f	16;01	18;01	Secondary	Berlin	Kreuzberg	TR	Family
YAS	m	16;02	18;02	Elementary	Berlin	Kreuzberg	TR/KU	Family

3.2. Research questions and hypotheses

Our research is oriented on the following questions pertaining to the lexicon:

a. Do lexical measures of diversity, word and text length differ according to genre (narrative vs. expository)?
b. How does the lexical usage of bilinguals differ in Turkish and in German?
c. What, if any, cross-linguistic influences in the lexicon are found in Turkish and German?

On the basis of our literature review, we expect measurements of text length and lexical richness to reveal expected differences according to age/grade, genre and the extent of instruction in Turkish. We formulated the following hypotheses for both languages (a-e), for German (f) and for Turkish (e), which we will test:

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other pupils. In Berlin Turkish is actually offered as a second foreign language at 11 schools (public and private). See http://www.berlin.de/sen/bildung/schulverzeichnis_und_portraets/anwendung/SchulListe.aspx (18.03.2011)

With increasing age, the text length increases

With increasing age, the vocabulary becomes more diverse and advanced.

Expository texts are longer than narrative texts.

Expository texts have more diverse and advanced vocabulary than narrative texts.

(As a result of typological differences) text length is longer in German than in Turkish.

Having Turkish instruction does not make a difference in text length and use of advanced vocabulary in German texts.

The pupils with Turkish instructions produce longer texts in Turkish and more advanced vocabulary than those without instructions.

3.3. Results

Using the methods of G and AG (Daller *et al*. 2003) we carried out an analysis of variance (one-way) and analysed text length with regard to age, genre, language and instruction in Turkish.

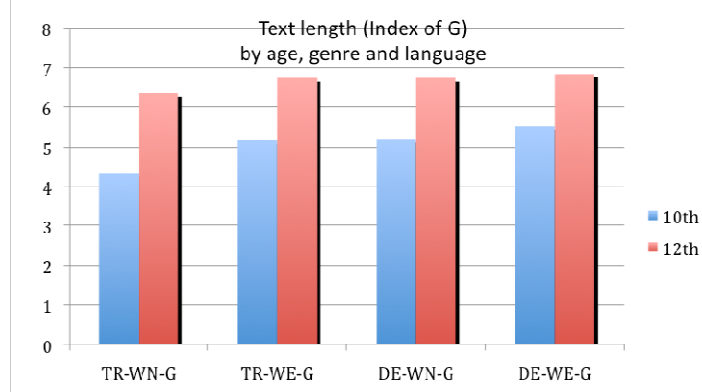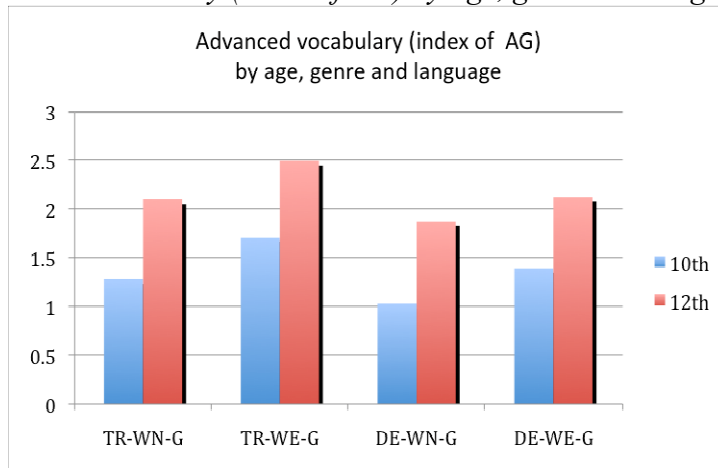*Figure 1:*   *Text length (index of G) by age, genre and language*

Table 2 shows that there is a high significance in age – the older the pupils get, the longer the text they produce ($p=0.01***$; see also figure 1). It is significant ($p=0.05*$) that in general German texts are longer than Turkish. In the 10th grade the difference can be seen clearly, whereas in the 12th grade the difference is not significant.

The average expository text length is in both languages in the 10th and 12th grade longer than in narrative texts, but statistically not significant ($p=0.83$ n.s.). German expository texts of the 12th graders have almost similar length (see figure 1). Our analysis of basic and advanced vocabulary shows heterogeneous results: Parallel to the degree of the text lengths, the increase of advanced vocabulary usage with age is highly significant ($p=0.01***$).

The usage of advanced vocabulary is higher in both languages and grades in expository texts (see figure 2), but statistically not significant ($p=0.11$ n.s.). However, there is a remarkable difference between the usage of advanced vocabulary in Turkish and German in the 12th grade, which will be discussed in detail in the following section.

Figure 2: Advanced vocabulary (index of AG) by age, genre and language

According to the pupils' questionnaires, we compared two groups of pupils, those who had Turkish instruction, and those who did not. While there are no significant differences in the text length (p=0.354, n.s.) and in the use of advanced vocabulary (0.813, n.s.) in German texts, surprisingly, it appears that having had Turkish instruction does not make a significant difference in text length (p=0.556 n.s.) and lexical diversity (p=0.167, n.s.; see figure 3): 12[th]graders expository texts in Turkish are longer than the texts produced by the pupils who have Turkish instructions. The amount of advanced vocabulary is even slightly higher in students who did not have any Turkish instruction, except in the 10th graders narrative texts (see figure 4).

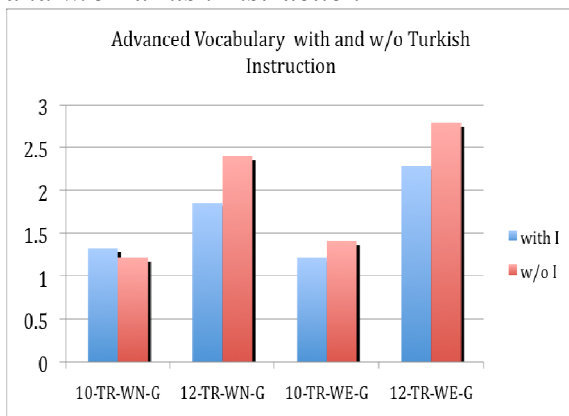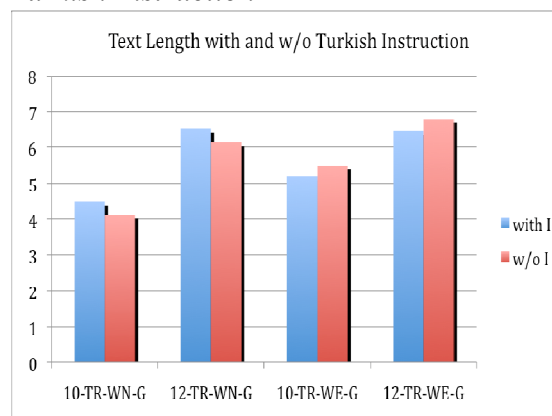*Figure 3: Advanced Vocabulary with and w/o Turkish Instruction*

Figure 4: Text Length with and w/o Turkish Instruction

(Table 2)   *Differences in regard to text length (G) (Anova one way)*

Measure	Mean	F-ratio	F-prob
Age	37,25	43,71	.000
Genre	1,56	1,83	.184
Language	3,79	4,45	.04
TR instruction (DE texts)	1,07	.89	.354
TR instruction (TR texts)	.417	.359	.556

p < 0,05*)=significant

(Table 3)   *Differences in regard to advanced vocabulary (AG) (Anova one way)*

Measure	Mean	F-ratio	F-prob
Age	11,79	43,46	.000
Genre	.72	2,65	.11
TR instruction (DE texts)	.035	.057	.813
TR instruction (TR texts)	.67	2,07	.167

To summarise, referring to our research questions, our results show that measurement of lexical diversity, word and text length differ according to age and genre. The question remains open what causes the usage of advanced vocabulary in German and Turkish to differ and what causes the lack of differences in Turkish text production with and without Turkish instruction.

Furthermore, we also compared the lexical usage in Turkish and in German texts. In the Turkish texts, we noticed there is a rare use of archaic words, eg. *mahiyet* 'character' instead of *karakter, iç yüz, öz* etc. The reason for this might be due to the usage of a Turkish variety with interlocutors, who are mostly family members (first/second generation) in the Turkish Diaspora. On the other hand, it is difficult to define those words as basic/advanced vocabulary, since we do not have evidence if the pupil has another (standard) lexical item for it.

On the lexical level, there is no use of German loan words but a small amount of orthographic transfer from German vocabulary in the Turkish texts, whereas no cross-linguistic influences of Turkish in German texts are found. According to us, this is due to the dominance of German language in the school setting and the subject of the stimulus video ('everyday school problems').

4. DISCUSSION

The analysis of our data has led us to conclude that the index of G might be useful to show the lexical development in one language, but it is not completely reliable for comparing two typologically different languages. Turkish is an agglutinative language, because of its morpho-syntactic structure, the content of one (e.g. German) sentence can be expressed with only one word. In comparison with German, the index of G cannot show much about lexical richness and development. Here we are confronted with the sensitivity of measuring and comparing text lengths cross-linguistically.

We have found that there is a (remarkable) difference in advanced vocabulary usage in the 12th grade, between Turkish and German texts, but these results do not reveal anything about lexical development. At this point we need to reconsider the dichotomy of basic/advanced vocabulary.

Moreover, we used word lists, which have been developed for early L1 or L2 acquisition for German and Turkish varieties, spoken in Germany. In this case, existing word lists, which were used for lexical richness and development, caused problems because of the different varieties of the languages. Our participants have been raised in an environment such as Berlin Kreuzberg (see chapter 3.1), where the participants themselves may or may not use Turkish extensively in their daily lives (see Pfaff *et al*. 2010). As proposed by Pfaff *et al*. (2010) a survey of teachers of Turkish as a foreign language and teachers of Turkish heritage language for bilingual children with a Turkish background in Berlin would be useful to judge their lexical competence according to their variety – this also counts for the German variety.

Another possibility would be to focus on internal criteria to refine the notions of basic and advanced vocabulary. The analysis of morphological complexity for example can give more various possibilities to define lexical richness according to the linguistic background than word lists do. In this study we consider morphological complex lexical items and nominalization as an advanced linguistic ability independent from word lists, which can be also seen as advanced vocabulary. The following examples taken from the LLDM/MULTILIT data give an idea about this approach:

(Table 4)   *Morphological complexity and nominalizations in Turkish and German*

	Turkish	German
Morphological complex items	"düşürttüğü" (ASL, 12th, we) düş-ürt-tüğ-ü fall-CAUS-PCTP-POSS.3SG '…that s/he made fall' davranışları (KEM, 12th, we) davran-ış-lar-ı behave-NMLZ-PL-POSS.3SG 'his/her behaviors' izlediğimiz (NIH, 12th, wn) izle-diğ-imiz watch-PCTP-POSS.1PL '…that we watch' değişiklik (NIH, 12th, we) değişik-lik different-NMLZ 'difference'	"türkischstämmig" (ASL, 12th, wn) türkisch-stämm-ig turkish-root-ADJ 'somebody with turkish roots' "Geldbesitzer" (VED,12th,we) Geld-besitz-er Money-own-NMLZ 'somebody who owns money' "zurückgegrüßt" (VED, 12, we) zurück-ge-grüßt back-PCTP-greet(3SG) "Schullaufbahn" (YAS, 12, we) Schul-lauf-bahn school-move-path 'school career'
nominalizations	"dışlamaması" (ASL, 12th, we) dışla-ma-ma-sı exclude-NEG-NMLZ-POSS.3SG "her/his non-exclusion" "bitmeyen" (AYH, 12th, we) bit-me-yen finish-NEG-PCTP 'not finishing' "görülmesi" (SER, 10th, wn) gör-ül-me-si see-PASS-NMLZ-POSS.3SG 'its being seen'	*"Mobbung" (VED, 10, wn) mobb-ung mob-NMLZ 'mobbing" "Schülersein" (YAS, 12, we) Schüler-sein pupil-be 'being a pupil' "Streitschlichterin" (ASL 10, wn) Streit-schlicht-er-in conflict-arbitrate-NMLZ-FEM 'somebody who arbitrates a conflict'

These complex morphological items show the pupils' linguistic abilities at a lexical level. We think that the more complex a structure is, the more advanced the structure becomes at the semantic-lexical level. On the other hand, these examples are frequent in everyday speech, but if we look at the word structure, then the derivational complexity can be seen. However, this approach is also not useful enough to analyze/compare the typologically different languages at the same level, but it can solve the reoccurring problems within word lists.

As acknowledged, there are only a few studies about the effect of Turkish instruction on the linguistic development of bilinguals. The study of Boos-Nünning & Karakaşoğlu (2005) shows that there is no significant correlation between "Herkunftssprachenunterricht" (community language teaching) and the self-rating proficiency of the participants in Turkish as their mother tongue. The evaluation of FörMig[8] shows (focusing on the transition from elementary to secondary school) a significant difference between Turkish bilinguals with and without Turkish instructions with regard to the lexicon. On average, the texts of the pupils with Turkish instruction contain more diverse vocabulary than those without Turkish

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[8] FörMig (Förderung von Kindern und Jugendlichen mit Migrationshintergrund) is a national pilot program supporting children and young people with an immigrant background.

instructions (see Reich 2009: 79f.; Klinger *et al*. 2008). Contrary to these results, in this study we didn't find any significant difference in text length and in advanced vocabulary in both languages correlating with Turkish instruction. In order to find concrete answers about why having Turkish instruction did not cause changes in the Turkish texts, more information about the course structure[9] and the pupils' motivation is needed. In any case, there is no influence[10] of Turkish instruction in German texts with regard to text length and the use of advanced vocabulary.

5. CONCLUSION & FUTURE ASPECTS

In this study, the two typologically different languages – Turkish and German – were compared. The adaptation of the methods, which were used by Daller *et al*. (2003), couldn't avoid problems caused by this difference. We also agreed on including qualitative along side the quantitative measurements (Daller *et al*. 2003). However, the results of our study show that the segmentation of the vocabulary in the dichotomy basic/advanced – in our research – is not useful. In the future there may be a need to rethink these notions and to find, as we proposed, other criteria for the word lists. If it is necessary to use a word list to measure the lexical richness and development, then there is need for a word list for the migrant language, spoken in Europe as a different variety of Turkish.[11] In general, it is necessary to investigate the lexical development of bilinguals and the effects of Turkish instruction in L1 and L2 as well.

Apart from a comparison of the lexical development of Turkish and German we have shown that there is a remarkable progress in each language with age. This gives an opportunity to support the lexical development with didactic aspects.

The next step will be to analyze also the spoken data to see the difference between written and spoken discourse and to include English as first foreign language. We believe that there is a cross-linguistic interaction between all three languages.

Acknowledgements

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[9] There are different structures of the Turkish course. E.g. reading, writing, grammar, cultural studies…etc.

[10] Hopf (2005) and Esser (2006) raised the discussion, that having mother tongue instruction would influence the development of L2 negatively.

11 Instead of ignoring the development of the Turkish language in Europe as a minority language, (see Boeschoten 2000; Rehbein 2001 and the recent and the repeated discussion about the acquisition of Turkish in Germany) it would be helpful to accept the reality that Turkish has a variety, which developed in Europe. Moreover, it is useful to create a Turkish dictionary for Turkish as an immigrant language, e.g. in cooperation with Türk Dil Kurumu (TDK).

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List of abbreviations:

3SG=third person singular
1PL=first person plural
ACC=Accusative
ADJ=Adjective
CON=Connector
CAUS=Causative
DE=German
FEM=Feminine
NEG=Negation
NMLZ=Nominalization
PCTP=Participle
RC=Relative Clause
TR=Turkish

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