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# Assessment of language proficiency in bilingual children: How valid is the interdependence hypothesis?

Kutlay Yagmur & Ömer Ahmet Konak

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Researchers increasingly focus on immigrant minority children's development of language proficiencies. Mostly based on single or multiple case studies, researchers and school practitioners claim language deficiency and/or subtractive bilingualism on behalf of immigrant minority children. In most multilingual settings, schools only measure immigrant minority children's mainstream language skills rather than their home language skills. On the basis of proficiency levels in the second language, most immigrant children are considered to be language-impaired. In order to provide appropriate schooling for such children, bilingual testing is vital. Given the multilingual composition of schools in Duisburg (Germany), policy makers carried out multi-level proficiency tests. These tests included six sections: phonemic differentiation, cognitive concepts, passive vocabulary, text comprehension, active vocabulary, and sentence imitation. The first four sections of the test were presented to children digitally (on a computer screen), while the last two were administered traditionally (with pen and paper). Apart from these tests, children completed a short survey questionnaire. On the basis of the survey instrument, it was possible to find out in which language, German or Turkish, children were dominant. In this presentation, empirical results of the Cito test are presented. Initial results show that balanced bilingual children have much higher skills in both German and Turkish. Moreover, they have higher metalinguistic awareness. The Turkish component of the test has been given to monolingual Turkish children in Ankara. The data have not been fully analyzed yet. If possible, the Turkish scores of bilingual children will be compared to those of monolingual Turkish children so that a double-comparative perspective can be presented.

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## Introduction

Researchers increasingly focus on immigrant minority children's development of language proficiencies. Mostly based on single or multiple case studies, researchers and school practitioners claim language deficiency and/or subtractive bilingualism on behalf of immigrant minority children. In most multilingual settings, schools only

measure immigrant minority children's mainstream language skills rather than their home language skills. On the basis of proficiency levels in the second language, most immigrant children are considered to be language-impaired. In order to provide appropriate schooling for such children, bilingual testing is vital. Given the multilingual composition of schools in Duisburg (Germany), policy makers realized the value of multi-level bilingual proficiency tests. Testing only the German proficiency of immigrant children does not provide an accurate assessment of their language competence. On the basis of monolingual German tests, most immigrant children are placed in special classes, in *Sonderschulen*, which children with disabilities attend. However, bilingual children must be assessed in both languages so that an accurate assessment of their linguistic competence can be made.

Regarding bilingual competence, one of the most brilliant theories aimed at explaining the cognitive effects of bilingualism is the threshold hypothesis (Cummins 1979). It is commonly accepted that cognitive development is essential for academic achievement. The relationship between language development and cognitive growth has certain implications for bilingual children's educational achievement. Cummins proposes (1977: 10) "there may be a threshold level of linguistic competence which a bilingual child must attain both in order to avoid cognitive deficits and allow the potentially beneficial aspects of becoming bilingual to influence his cognitive growth". A threshold explains the difference between a balanced bilingual and a dominant bilingual. Each threshold is a level of language competence that has consequences for a bilingual child. In order to avoid the negative consequences of bilingualism, the child has to reach the first threshold in both of his languages. If the child reaches the second threshold, he will be able to obtain cognitive benefits from bilingualism. Concerning language competence, bilingual speakers might be equally dominant in both languages, or more dominant in one language only, and/or insufficiently competent, *semilingual*, in either of the languages (Baker 2004). Even though some theories of Cummins are disputed, there is universal consensus among educational specialists that a relationship of interdependence exists between first language and second language. On the basis of empirical findings, we will be able to test Cummins' linguistic interdependence hypothesis in this paper.

### **Academic success and language competence**

The majority of Turkish immigrants originate from rural areas in Turkey. Most of their parents have very little or sometimes no schooling at all. Even though Turkish families value education, they are unable to provide guidance and support for their children at home. Low skills in Dutch or German as well as cultural differences between the mainstream school system and home culture act as barriers to parents' involvement in their children's educational process. Involvement in children's schooling is mostly dependent on the parents' level of education, rather than on their ethnicity. Both in the German and the Dutch context, Turkish immigrant children are shown to lag some years behind native children. For instance, Driessen (1996)

showed that at the end of primary education, Turkish and Moroccan children are approximately 2 years behind in their language development compared to children of highly educated Dutch parents. This finding is not surprising at all because the majority of the Turkish and Moroccan parents in the Netherlands belong to the working class, and in most cases they have very little, if any, formal education. If low SES (socioeconomic status) Dutch children's examination results were compared to the results of high SES Dutch children, the same differences would emerge. Instead of pointing out the social differences, however, some researchers prefer pointing out the ethnic differences. Concluding from such results, most policy makers claim that immigrant Turkish and Moroccan children perform worse at schools because 'they speak another language at home'. Actually, Klatter-Folmer's (1996) study has shown that Turkish children's language proficiency, in terms of their command of Turkish and Dutch, is closely related to their educational achievement. She has also shown that proficiency in the first language goes hand in hand with proficiency in the second language. Those students who perform the best at school had high proficiency levels both in Turkish and Dutch.

Driessen & Van der Slik, and de Bot (2002) provides conclusive evidence to the discussion of home language versus Dutch language proficiency. The authors conducted a large-scale longitudinal study of the development of language proficiency of Dutch primary school pupils aged 7-10. On the basis of their findings, they show that Turkish pupils whose parents speak Turkish at home perform significantly lower than the children of Dutch-speaking parents. Driessen & Van der Slik & de Bot, however, do not report any findings concerning differences between the language proficiency of Dutch-speaking Turkish parents and Turkish-speaking Turkish parents. Availability of such findings might provide more conclusive evidence for the matter. Nevertheless, Driessen & Van der Slik & de Bot (2002) contributes further evidence to the discussion. Concerning Dutch language proficiency differences, they show that dialect speakers perform even better than the native Dutch speakers. They conclude that children in dialect-speaking families find themselves in a diglossic situation in which they have mastered both languages (Dutch and the home dialect) but use them in different areas. Immigrant parents do not show this type of bilingualism or at least not to a similar degree. These findings strongly point to the fact that due to insufficient command of the first language, there is no positive transfer possible to the second language. Driessen & Van der Slik & de Bot (2002: 191) conclude:

"Our analyses also show that the children's use of a language other than Dutch does not need to have any negative consequences for language proficiency. Limburgish-speaking children use Dutch the least, but they have the highest language proficiency score; whereas Turkish- and Moroccan-speaking (i.e. Arabic) children speak Dutch more often, yet they have a much lower language proficiency score."

As opposed to public discourse, with their findings Driessen, Van der Slik & de Bot (2002) show that home language use does not have any negative effects on the dialect-speaking children's development of Dutch. Preparing language minority

children for more successful school careers ideally requires a balanced bilingual approach in which children's greater proficiency in the home language is utilised to promote general cognitive development and acquisition of the school language (Lese-man & van Tuijl 2001: 309). According to Ammermüller (2005), the main reason for the low performance of immigrant students can be seen in the later enrolment of immigrant students and the less favourable home environment for learning. The most important differences are the higher-grade level of German students, more home resources as measured by the number of books at home, and the fact that a high share of about 40 percent of all immigrant students speak another language at home. Differences in parental education and family situation are far less important. Also in the German context, students' home languages are shown to be the culprits for low achievement in the schools. On the basis of the findings derived from the present study, the relevance of such claims will be tested.

### **Present study**

In this article, we want to empirically test the relevance of Cummins' (1979) developmental interdependence hypothesis, which suggests that a child's second language competence is partly dependent on the level of competence already achieved in the first language. The more developed the first language, the easier it will be to develop the second language. In order to see the relationship between first and second language competence, the bilingual test developed by Cito is effective in many respects. The Cito *Sprachtest* was developed to test the language proficiency of young children growing up in Germany. The original form of the test was developed by Tilburg University in co-operation with Cito (Verhoeven et al. 1990). Later on, this test was adapted to the German context in co-operation with the Duisburg Education Department (Konak, Duindam & Kamphuis 2005). The purpose is to measure the German language proficiency of children 10 months before they start primary school so that students' weak language proficiency can be improved before they start school. This test enables schools to identify which students would need such extra language support. In order to overcome inaccurate appraisals of students' linguistic abilities, the same test was developed in Turkish so that students who belong to this large immigrant group can be assessed accurately.

The Cito *Sprachtest* includes six sections: Phonological awareness (PA) – 30 questions, cognitive concepts (CC) – 65 questions, passive lexicon (PL) – 60 questions, text comprehension (TC) – 20 questions, active vocabulary, and sentence imitation. The first four sections of the test were presented to children digitally (on a computer screen), while the last two were given traditionally (with pen and paper). Apart from these tests, children completed a short survey questionnaire. On the basis of the survey instrument, it was possible to determine in which language, German or Turkish, children were dominant. Due to space limitations, the full details of the test are not presented here.

### Informants

All children who were about to begin the primary school in Duisburg completed the Cito *Sprachtest*. A total number of 5,330 children completed the test. All children taking the test completed a questionnaire to provide background information. One of the questions was on the home languages of these children. The children indicated with whom they spoke what language at home. They also reported which language they thought they were most dominant in. In Table 1, the numbers of children belonging to the monolingual German group and the Turkish groups are presented.

Table 1: Distribution of informants

Groups	N	Percentage
German (mono)	2954	55.4
German-Turkish	357	6.7
German-Other	483	9.1
Other	295	5.5
Turkish	1241	23.3
Total	5330	100.0

As seen from Table 1, almost 29% of the all school children come from a Turkish-speaking background. Around 6.7% of these children claimed that they were more dominant in German than Turkish, whereas 23% of children reported that they were more dominant in Turkish.

In addition to the language test, students completed a language survey. The survey results show that:

37 languages next to or instead of German are spoken by 44.6% of children,

29% of these immigrant children are Turkish-speaking, while 15.4% speak another language (Russian, Polish, etc.),

55.4% of children are monolingual German-speakers.

These results suggest that almost half of the student population in Duisburg is multilingual. For space limitations we cannot list all the languages, but there are 37 different languages reported by children. The two largest language groups are monolingual German speakers (55%) and Turkish speakers (29%), which is why the Duisburg Education Department decided to also test the Turkish proficiency of children belonging to that particular group.

Table 2: Age of the informants (in 6 month-intervals)

Groups	<5	5 - 5.5	5.5 - 6	6 - 6.5	6.5 - 7	7 >	Unknown	Total
German (mono)	26	424	1132	795	71	16	92	2556
German-Turkish	0	29	115	99	14	2	0	264
German-Other	9	60	170	145	16	5	17	422
Other	1	31	105	84	18	5	5	249
Turkish	7	96	404	282	49	9	16	863
Total	43	640	1926	1402	168	37	135	4354

As seen in Table 2, the ages of children vary between 5 and 7, while the majority of children are within the age category from 5.5 to 6.5.

### Test results

Given the large number of informants, the results presented here are highly representative. Furthermore, testing the children along different language skills provides a much better picture of their linguistic competence. In order to test the validity of the test, all components of the test (both the German and the Turkish version) were subjected to a reliability analysis. The results show high Alpha values: For cognitive concepts (CC), Alpha=.84 for the German test, and Alpha=.83 for the Turkish test. Accordingly, high scores were obtained for passive lexicon (PL), Alpha=.84 for the German test, and Alpha=.80 for the Turkish test; for phonological awareness (PA): Alpha=.90 for the German test, and Alpha=.87 for the Turkish test; but for text comprehension (TC) the scores were comparably lower: Alpha=.81 for the German test, and Alpha=.66 for the Turkish test. In the following tables, the scores of monolingual German speakers will be compared to German-dominant Turkish children, who will be called 'Ger-Tur' group and Turkish-dominant Turkish children, who will be identified as Turkish. Also the results of German-dominant immigrant children (Ger-Other), and non-German dominant children (Other) will be presented. Overall, monolingual German speakers receive the highest scores on all dimensions of the test. In Table 3, the results of a t-test between monolingual German and German-dominant Turkish children are presented. Even though bilingual Turkish children claim that they are more dominant in German, there are large and significant differences between the two groups' German proficiency scores.

Table 3: Comparison of German &amp; Ger-Tur group on the German test

Subtest	German	German-Turkish	F	t	df	P
CC	51.33	43.50	7.32	16.40	2818	.000
PL	49.10	38.70	10.01	19.870	2818	.000
PA	21.81	17.86	7.68	9.02	2818	.000
TC	14.57	10.89	.01	14.51	2818	.000

As seen in Table 4, the differences are even larger between monolingual German and Turkish-dominant bilingual children. Compared to monolingual German speakers, the German proficiency of Turkish immigrant children is significantly lower. On the basis of these initial results, it is not surprising that these Turkish-dominant bilingual children have much lower academic performance.

Table 4: Comparison of German &amp; Turkish groups on the German test

Subtest	Mean German	German-Turkish	F	t	df	P
CC	51.33	38.42	12.51	43.59	3417	.000
PL	49.10	31.26	38.08	54.58	3417	.000
PA	21.81	16.32	186.55	21.57	3417	.000
TC	14.57	8.91	36.42	37.94	3417	.000

When we compare the results of German-dominant Turkish children with those of German-dominant children of other ethnic groups, there are again significant differences between their German proficiency scores. Turkish immigrant children score considerably lower.

Table 5: Comparison of Ger-Tur&amp; German-Other groups on the German test

Subtest	German-Turkish	German-Other	F	t	df	P
CC	43.50	47.14	0.01	5.51	684	.000
PL	38.70	43.69	0.11	7.13	684	.000
PA	17.86	19.86	1.86	3.89	684	.000
TC	10.89	12.73	2.39	5.81	684	.000

The t-test results between German-dominant Turkish children and non-German dominant children from other ethnic groups show that the Turkish group scores significantly higher on the cognitive concepts and passive lexicon sub-tests, while there are no significant differences between phonological awareness and text comprehension.



Table 6: Comparison of Ger-Tur &amp; Other groups on the German test

Subtest	Other	German-Turkish	F	t	df	P
CC	40.73	43.50	3.02	3.57	511	.000
PL	34.90	38.70	6.24	4.45	511	.000
PA	17.15	17.86	7.56	1.31	511	n.s
TC	10.33	10.89	0.51	1.62	511	n.s

The t-test results between Turkish-dominant Turkish children and non-German dominant children from other ethnic groups show that the Turkish group scores significantly lower on the cognitive concepts, passive lexicon, and text comprehension sub-tests, while there are no significant differences for phonological awareness. The results presented in Table 7 clearly show that Turkish-dominant immigrant children have the lowest German proficiency score among all the groups included in the study.

Table 7: Comparison of Other &amp; Turkish on the German test

Subtest	Other	Turkish	F	t	df	P
CC	40.73	38.42	6.85	3.82	1110	.000
PL	34.90	31.26	6.81	5.37	1110	.000
PA	17.15	16.32	1.58	2.13	1110	n.s
TC	10.33	8.91	18.77	5.68	1110	.000

As expected, a t-test between German-dominant Turkish children and Turkish-dominant Turkish children shows significant differences in their German proficiency scores. As seen in Table 9, the self-reports of children are also confirmed this result that irrespective of their age, children were conscious of their proficiency levels in their respective languages. Those children who claimed that they were better in German scored much higher on the German test than those children who claimed that they were more dominant in Turkish.

Table 8: Comparison of Ger-Tur &amp; Turkish group on the German test

Subtest	German-Turkish	Turkish	F	t	df	P
CC	43.50	38.42	0.19	8.23	1125	.000
PL	38.70	31.26	0.31	11.67	1125	.000
PA	17.86	16.32	24.98	3.89	1125	.000
TC	10.89	8.91	12.26	11.25	1125	.000

When we examine the scores of Turkish children on the Turkish version of the test, the results turn out to be much more intriguing. Yet, the results are highly indicative in terms of Cummins' interdependence hypothesis. Table 9 shows the average scores of German-dominant and Turkish-dominant children.

Table 9: Scores of Ger-Tur & Turkish groups on the Turkish version

Group - Test	PL (60)	CC (65)	PA (30)	TC (20)
Ger-Tur(N)	204	201	200	198
Mean	40.39	42.80	19.03	11.88
sd	5.75	8.03	6.77	3.49
Turkish (N)	701	697	689	682
Mean	39.72	40.36	16.77	10.54
sd	7.28	8.35	5.75	3.52

When we carry out t-tests between these groups of Turkish children, it is clear that German-dominant Turkish children score significantly higher than Turkish-dominant Turkish children on the Turkish version of the test. Only concerning phonological awareness, there is no significant difference between the two groups. Nevertheless, it is highly intriguing that children who thought their proficiency in Turkish was higher, scored much lower compared to children who thought their German proficiency was better. Table 10 clearly documents this interesting case. In order to better understand these test results, comparing the results of the German and Turkish tests for each group might provide further evidence. The t-test results for that purpose are presented in Tables 11 and 12.

Table 10: Comparison of Ger-Tur & Turkish groups on the Turkish version

Subtest	German-Turkish	Turkish	F	T	df	P
CC	42.80	40.36	.202	2.23	896	.000
PL	40.39	39.72	.70	2.95	903	n.s
PA	19.03	16.77	18.74	2.52	887	.000
TC	11.88	10.54	0.19	4.25	878	.000

The t-test results between German-dominant Turkish children's scores on the German and Turkish tests clearly show that these children's Turkish language skills are superior to their German skills. This particular finding fully supports the interdependence hypothesis that skills acquired in the first language are transferred to the second language provided that children reach a certain threshold. The bilingual children who indicated that they were more dominant in German emerged as more dominant in their Turkish skills. The findings presented in Table 11 clearly illustrate the relationship between first and second language proficiency levels.

Table 11: Scores of German–Turkish group on both versions of the test

Subtest	German Test	Turkish Test	sd	T	df	P
CC	43.61	42.60	8.39	- 1.33	120	n.s
PL	37.80	40.45	6.49	-3.10	122	.003
PA	18.38	18.93	9.61	-.92	119	n.s
TC	11.14	12.17	2.79	-4.10	117	.000

When we compare the German and Turkish scores of children who reported that they are dominant in Turkish, they appear to be accurate in their assessment. As seen in Table 12, these children have higher proficiency in Turkish.

Table 12: Scores of Turkish group on both versions of the test

	German Test	Turkish Test	sd	T	df	P
CC	37.93	40.73	7.76	-7.11	384	.000
PL	30.40	40.14	9.56	-20.03	382	.000
PA	16.25	17.10	6.41	-2.60	385	.010 (n.s)
TC	8.73	10.64	2.97	-12.628	381	.000

The findings presented in this section have important implications for language proficiency of Turkish immigrant children growing up in Germany. In order to be able to establish threshold levels, at least on the content of these test results, we need to carry out further psychometric analyses on the basis of which we can prove the relationship between underlying competences in the respective languages.

### Conclusion and discussion

On the basis of the results we can derive a number of conclusions and implications. In the first place, there is interdependency between the Turkish and German scores of bilingual children who claimed higher dominance in German. This is probably due to higher thresholds reached by these children. In order to arrive at much more specific results, individual scores of children need to be identified, and an informant by informant correlation between the two tests needs to be done.

On the basis of the results, two outcomes are certain: (a) All Turkish informants are more dominant in their L1 Turkish. By matching the data with parents' country of birth, inter-generational variation and its effect on L1 and L2, proficiency can be documented; (b) Compared to mainstream German and other ethnic groups, Turkish informants perform the poorest on the German test. Further research on this matter is necessary. Because the dependency between the two languages is certain, policy makers need to ensure that literacy skills in children's first language are promoted in

the schools. Also, in schools where Turkish children are in the majority, they need to receive intensive instruction in Turkish at least for the first three years so that concept development in the first language can be transferred to the second language. The same Turkish test has been administered in Turkey to monolingual children; we cannot present the findings here, but there are significant differences between the performance of immigrant children and monolingual children, which is certainly not surprising. Given the amount of input Turkish immigrant children are exposed to, such differences are normal. However, the considerable differences between monolingual and bilingual children in the German context need to be further investigated.

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