Transfer into L3 English

Global accent in German-dominant heritage speakers of Turkish

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This study is concerned with L3 acquisition in heritage speakers (HSs). The goals are to incorporate HSs into L3 acquisition research and investigate the role of language dominance for predicting L3 transfer. We analyze global accent in German-Turkish early bilinguals, HSs of Turkish, who acquired English as their L3. Twenty native-speaker judges determined accent strength and accent source in the speech of 18 bilinguals as well as 15 controls (L1 English, L1 German, L1 Turkish) when speaking English. Results show, firstly, that bilinguals are perceived as less accented than L1 Turkish speakers and similar to L1 German speakers. Secondly, unlike L1 controls, there is no uniform accent source for HSs when speaking their L3. Our results question the role of age of acquisition, while being generally consistent with the TPM. However, HSs seem to benefit from bilingual experience and structure-based transfer can be overpowered by high proficiency.

Keywords: L3 acquisition, global accent, heritage speakers

1. Introduction

Studying transfer into L3[1] is particularly relevant to our understanding of foreign language acquisition generally since, as opposed to L2 acquisition, there are two (or more) previously acquired languages and both can be potential transfer sources. For phonology, empirical evidence indeed suggests that both L1 and L2

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1. In the literature, the abbreviations *L3* and *Ln* acquisition are often used interchangeably. In this paper, we use the term *L3* to refer to the chronologically acquired third language of early bilinguals.

can be transfer sources for L3 (e.g., Cabrelli Amaro, 2012; Gut, 2010; Wrembel, 2011, 2012). However, studies have so far focused mostly on learners who grew up monolingually and acquired a second language subsequently in a formal setting at school. The present study will take a fresh look at L3 acquisition from the perspective of heritage speakers (henceforth HSs) acquiring an L3.[2] Specifically, we assess global accent[3] in Turkish HSs, who acquired Turkish (L1) at home from birth, German (second L1 or early L2) as the majority language of their environment aged 0–7 years, and English as the chronologically third (L3) and first foreign language at German schools. We assess global accent in English with regard to (i) the degree of perceived accent and (ii) the perceived transfer source (i.e., Turkish or German). In addition to general beneficial effects of bilingualism and the role of typological proximity, we seek to explore the role of language dominance and age of onset of acquisition (henceforth AoO) in the majority language when predicting L3 transfer in HSs.

Previous studies in L3 acquisition have largely been discussed in light of three models: the Cumulative Enhancement Model (CEM), the Typological Primacy Model (TPM), and the L2 Status Factor Model (L2SFM). It should be noted that these models pertain to L3 transfer at the initial state. However, most studies on L3 acquisition — and all of those on L3 phonology — examine more advanced L3 learners, which potentially presents an issue for distinguishing facilitative transfer from acquisition.

The CEM maintains that any language available to the multilingual learner can be the source of transfer, irrespective of order of acquisition (Flynn, Foley, & Vinnitskaya, 2004). However, transfer only occurs when such knowledge has a facilitative effect; otherwise is neutralized or "blocked". By implication, it may be hypothesized that multilinguals have general advantages over monolinguals, as they have more possible transfer sources.[4] According to the CEM, a learner does not transfer an entire system but individual properties.

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2. L3 acquisition in HSs has been previously investigated by Polinsky (2015). However, she was primarily interested in HSs who "re-learn" their heritage language as an L3, which is different from our case.

3. "Global foreign accent" usually refers to ways in which a person's speech differs from that of a local or standard variety. It is referred to as "global" because it subsumes (at least) segmental and supra-segmental phonological features. We will be using the term "global accent" rather than "global foreign accent" because not all speakers whose accent we investigated sounded foreign.

4. These assumptions seem to tie in with Cummins' (1976) education-oriented approach, which that positive cognitive learning effects may occur if learners have reached a certain level of proficiency in both background languages.

The TPM claims that multilingual transfer is determined by structural similarities between languages (Rothman, 2011, 2015). It is a model for the initial stages in L3 acquisition, where transfer is assumed to occur completely from one previous system, much like in Schwartz and Sprouse's (1996) Full Transfer Model. Structural similarity refers to "linguistic properties, lexical or grammatical, that overlap cross-linguistically at the level of mental representation" (Rothman, 2015: 179). Being based on overlapping properties, transfer is driven by cognitive economy. In our case for example, pre-theoretically, there is less typological distance between German and English than between Turkish and English, which is why transfer from German to English is plausible. Recently, Rothman (2015: 187) speculated that if multilingual transfer is driven by cognitive economy, one might predict that "early bilinguals would not need to transfer either the L1 or L2 completely as a function of more temporal bilingual experience and the growth of inhibitory control". Possibly, this implies that transfer patterns can differ depending on the domain under study. For example, the transfer patterns in phonology may differ from those in syntax.

Unlike the TPM and CEM, the L2SFM hinges on the distinction between L1 and L2 acquisition. The original version of the L2SFM (Bardel & Falk, 2007) predicts L2 transfer into L3 due to similarities in the *learning procedures* in L2/L3 acquisition as opposed to L1 acquisition. A more recent version (Bardel & Falk, 2012) rests on Paradis' (2009) distinction between procedural and declarative memory. Native speakers have mostly implicit and automatized knowledge of their phonological, morphological and syntactic systems, which are sustained by procedural memory (Paradis, 2009: 12). L2 learners, by contrast, have metalinguistic and explicit knowledge about grammar, sustained by declarative memory. Given similarities between L2 and L3 in general learning procedures, L3 learners will transfer from L2 in domains relying on declarative memory. These ideas originated with the typical "monolingual L1 learner" in mind, who acquires their L2 through formal instruction. Proponents of the L2SFM vary in terms of how they define "L1" and "L2", either on the basis of AoO and critical periods, or in terms of how the language was acquired (naturalistic vs. formal setting), or both. And while defining "L1" and "L2" is already a thorny issue, this is even more so when it comes to HSs because, unlike late L2ers, their AoO varies and they tend to acquire their L2 in a naturalistic setting (unless their first contact with the majority language happens with school entry).[5] If one defines "L2" on the basis of *how* the language was acquired, HSs would constitute a homogeneous group because their L2 grammatical knowledge is procedural, just like their L1 knowledge. The alternative way

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5. In addition, there are many other variables that contribute to the heterogeneity of this group, notably frequency of input and social prestige of the heritage language.

of interpreting the L2SFM is by making reference to a critical period dividing L1 and L2 acquisition, as mentioned above.[6] Thus, the population of HSs may include both simultaneous and successive bilinguals (arguably "L2 learners"), depending on when they were first exposed to the majority language. Paradis (2009) claims that phonological acquisition is the first area of language to be negatively affected by a critical period, relating it to age of 4–5 (Paradis, 2009: 110). This age span is controversial, with indications that the ability to acquire a native-like accent declines even earlier (e.g., Abrahamsson & Hyltenstam, 2009) and, conversely, indications that some L2 learners may attain native-like pronunciation independently of AoO (e.g., Bongaerts, 1999; Birdsong, 2003 for phonology).[7] But let us assume for the sake of the argument, and following Paradis, that there is a critical period for phonology around age 4–5, and let us further assume that this period is relevant for L3 transfer. On these premises, we would predict that HSs with an AoO before age 4–5 in the majority language show transfer patterns different from those of HSs with an AoO after age 4–5.

Note, however, that even Paradis (2009) assumes that L2 learners can eventually replace conscious use of metalinguistic knowledge with automatized processing. Therefore, assumptions on how type of learning constrains transfer patterns in L3 may not be generalizable to learners at an advanced level of proficiency. Furthermore, even if there existed a critical period for phonology, it is unlikely to be associated with one particular age period (e.g., 4–5 years), because the age at which monolingual children achieve adult-like perception and production varies depending on the property. For example, Kong, Beckman & Edwards (2012: 742) report that the short lag VOT category appears first in children's productions, the long lag VOT category appears next, and the lead VOT category appears last, often after the age of 5 years. In short, the L2SFM hinges on the distinction between L1 and L2 acquisition, but whether the model is relevant or not for predicting transfer in HSs acquiring an L3 depends on whether the L1/L2 distinction is linked to a critical period, the type of learning (naturalistic vs. instructed), and possibly the proficiency level.

In this paper, we bring another factor into play, namely language dominance, asking whether the dominant language could be the preferred transfer source for L3 phonology. We operationalize language dominance by two means: (i) proficiency, and (ii) frequency of language use. The role of language dominance with respect to L3 transfer has remained rather vague in research to date. The reason

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6. To our understanding, this would not be fully in line with Bardel & Falk (2012), who take the relevant differences between L1 and L2 to be grounded in the type of learning.

7. Even if these learners are exceptional, the fact that they exist challenges the assumption of a critical (biologically predetermined) cut-off point.

might be that the learners in most previous studies acquired their L2 at age 10 or even later, which in most cases implies that their L1 proficiency exceeded L2 proficiency and that their L1 development had been completed before L2 acquisition began. However, an increasingly common learning scenario is represented by HSs who acquire an early L2 which becomes their dominant language over time.

The participants of our study are early bilinguals, including simultaneous bilinguals (2L1s) and early second language learners (eL2s).[8] There is evidence that 2L1s behave like monolingual learners in many aspects of language development. Generally speaking, 2L1s pass through the same acquisition stages as monolinguals, making the same type of errors, and separating their two languages from early on, although the languages may influence each other quantitatively (Meisel, 2011). There is ample evidence for bidirectional cross-linguistic influence during the early years, including the domain of phonology, which may be determined by language dominance or markedness (see e.g. Lleó 2002, on truncation, Lleó & Rakow 2004 on spirantization, Lleó & Cortés 2013 and Lleó, in press, for an overview). For eL2 acquisition, however, the situation is less clear. Some researchers have postulated a cut-off point around age 4 at least for some aspects of morphology (Meisel, 2011); for phonology, there is evidence that nativelikeness decreases with growing age (Abrahamsson & Hyltenstam, 2009; Flege, Yeni-Komshian, & Liu, 1999). But in contrast to the findings pointing to a critical age for some aspects of morphosyntax and phonology, some HSs, including eL2 learners, attain monolingual-like competence in the majority language of their environment (Stangen, Kupisch, Proietti-Ergün, & Zielke, 2015). In summary, 2L1 and L1 acquisition appear to be subject to the same learning procedures, but eL2 learners sometimes pattern with (2)L1 learners and sometimes with adult L2 learners, which raises the general question of whether L3 transfer models should take AoO into account when predicting the transfer source for these learners.

In what follows, we summarize previous research on L3 phonology and the possible role of language dominance. Section 3 introduces our German-Turkish participants. Section 4 presents our methodology and results. The paper ends with a discussion and a conclusion in Sections 5 and 6.

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8. We will use the term "(early) bilingual" as a cover term for 2L1s and eL2s and we take the age between 3 and 4 years to be the dividing line. By drawing this distinction we do not mean to imply the existence of a critical period at this age, although such a claim has been made with respect to morphosyntax (e.g., Meisel, 2011).

2.   Previous studies in L3 phonology

2.1 L3 Phonology

A question often raised in L3 accent studies is the role of L2 status versus typological primacy for transfer. For example, L2 status was attested by Llama, Cardoso and Collins (2010), who investigated the production of voiceless stops in two groups of L3 Spanish learners with L1 English and L2 French (*n* = 11) and L1 French and L2 English (*n* = 11). It was assumed that, if typological proximity were the motivating factor for transfer, then both groups should benefit equally from their knowledge of French, since both French and Spanish are characterized by non-aspirated stops (Llama et al., 2010: 51). Instead, both groups transferred from L2, with the L2 French group producing target-like VOT values, and the L2 English group producing L3 stops with longer VOT than required in Spanish, which may testify to influence from English (2010: 52). However, as noted by the authors, this study did not use measurements in the speakers' L1s or a monolingual control group.

Other studies have attested transfer from the L2 for the initial stage of L3 acquisition only (Hammarberg, 2001; Wrembel, 2010). In Hammarberg's (2001) single-case study, an L3 Swedish learner with L1 English and L2 German was perceived to have a "prominent German accent" during her first year in Sweden, yet speech samples recorded one year later were perceived by the same raters as distinctly English. The activation of L2 at the initial stage of acquisition was seen as an unconscious strategy employed by the speaker to cope with unfamiliar phonological forms and to avoid "sounding English". As proficiency in L3 increased, this strategy was overridden by the highly-automated articulatory patterns of L1 (Hammarberg, 2001: 35). Similarly, in Wrembel's (2010) study, L1 Polish, L2 German, and L3 English speakers with a lower proficiency in L3 were mistaken as German speakers more frequently than those with a higher proficiency, which, analogous to Hammarberg's results, suggests that L2 transfer was more noticeable at the initial stage of L3 acquisition.

However, it was not clear in either of the above studies whether the transfer observed from L2 was due to L2 status or typological proximity. In order to isolate these effects, Wrembel (2012) later investigated 9 speakers of languages with relatively little phonological comparability, namely L3 English (stress-timed), L2 French (syllable-timed), and L1 Polish (a mixture of both), with varying L3 proficiency (Wrembel, 2012: 288–289). In contrast to results from her previous study, the majority of speakers were correctly identified as L1 speakers of Polish, with an insignificant amount of transfer detected from L2 French. However, in the 2012 study, the L2 status of French was determined by proficiency rather than chronology, which may explain these diverging results. Wrembel concedes that

since English was learned before French, certain acoustic patterns may already have been established in English and have therefore been more resistant to transfer from French.

Gut (2010) likewise assumed that L3 transfer was related to proficiency and language awareness in the speakers' background languages. In her study on the L3 speech production of four L1 speakers of Polish, Russian, Hungarian and Spanish, with either L2 German and L3 English ($n = 2$) or L2 English and L3 German ($n = 2$), Gut investigated the speakers' ability to produce native-like speech rhythm and vowel reduction. No conclusive evidence for L1 transfer was found. Typological proximity did not appear to have a predictive effect either, as the sole speaker whose L1 and L3 shared similar vowel reduction and speech rhythm patterns did not outperform the other speakers. Instead, the most native-like speech rhythm in L3 was attested for the L1 Spanish speaker, despite the divergent rhythmic properties of Spanish when compared to German and English (Gut, 2010: 3). Evidence of transfer from L2 was equally inconclusive, although a certain degree of positive L2 transfer was suspected in the Polish and Hungarian speakers' (albeit limited) ability to use vowel reduction in L3, since this phenomenon is non-existent in their L1. In relation to the lack of clear evidence for phonological transfer, Gut proposes, similarly to Wrembel, that the speakers' high L2 proficiency may have precluded any potential transfer from L1 (Gut, 2010: 33–34).

Counterevidence for the role of proficiency was found by Gallardo del Puerto (2007), who observed Basque-Spanish bilinguals acquiring L3 English. The participants included 30 "balanced bilinguals" who spoke predominantly Basque with their parents, and 30 "less bilingually balanced" individuals who used mostly Spanish. In their results, bilingual proficiency was not predictive for L3 perceptual ability, neither globally nor with respect to individual phonemes. However, the study investigated receptive skills only and proficiency was operationalized merely in terms of self-reported use of the minority language.

Since most L3 accent studies focus on late L2 learners, the implications of the above findings for early bilinguals still need to be investigated. Evidence from a study with five Turkish-German heritage speakers learning L3 Spanish tentatively suggested that higher proficiency in the heritage language facilitated positive transfer from the L1 (Gabriel & Rusca-Ruths, 2014). The bilinguals tended to produce the rhythm of L3 Spanish more monolingual-like than five German monolinguals, suggesting positive transfer from Turkish, which is syllable-timed like Spanish. This effect was stronger in individuals with a higher degree of phonological awareness (which appears to have been determined based on material from semi-structured interviews) and frequency of use in Turkish.

In summary, none of the above studies testify completely to the CEM, the TPM, or the L2SFM models, suggesting instead that foreign accent may be based

on other aspects such as acquisition stage, proficiency, or phonological awareness. Since acquisition order is independent of proficiency for HSs, we are presented with the opportunity to investigate these two variables independently of each other.

2.2 The role of language dominance

Comparatively little is known about what role proficiency, or language dominance more generally, play in L3 acquisition in early bilinguals who have become dominant in their L2. The concept of language dominance has existed since the earliest studies on early bilingual development (see, e.g., Leopold, 1939–1949). However, only recently have researchers recognized the importance of clarifying the concept of language dominance, and it turns out that there has been no uniform approach either in defining nor in operationalizing this concept.

Most authors operationalize dominance in terms of either proficiency or frequency of use but not both (see the contributions in Treffers-Daller & Silva-Corvalán, 2015 for various opinions). In proficiency-based approaches, the more proficient language equates to the dominant language (Birdsong, 2014; Kupisch & van de Weijer, 2015). This neither excludes monolingual-like proficiency in both languages, nor does it imply monolingual-like proficiency in at least one language. It simply means that bilinguals are almost never perfectly balanced. In the case of highly proficient bilinguals, it may even be the case that language dominance varies depending on the type of skill. For instance, a speaker may have monolingual-like syntactic intuitions in language A, while having a larger vocabulary in language B. This is why, in the present study, we will make reference to *phonological proficiency* rather than general linguistic proficiency. In contrast to proficiency-based definitions, some researchers see language dominance in terms of the language spoken by the larger national environment (Argyri & Sorace, 2007). This view is essentially based on the idea that the dominant language is the language used and heard more frequently.

The two approaches thus differ in terms of how dominance is operationalized. Frequency-based approaches will measure relative input to determine dominance, while proficiency-based approaches will measure how well bilinguals perform on certain tasks, often comparing them to monolingual norms (see Birdsong & Gertken, 2013 for a critical discussion). Of course, the two measurements are related because more frequent input and use may ultimately result in higher proficiency, as shown in Kupisch and van de Weijer (2015). However, we do not want to assume a priori that they also have the same effects on L3 transfer, which is why we will test their potential effects separately.

Summarizing, previous research leaves open whether the same mechanisms that operate in monolingual learners also apply to HSs, and thus, whether the existing models on L3 transfer can predict cross-linguistic influence for these early bilinguals. Similarly, the role of proficiency or language dominance has remained rather vague. Besides discussing current models of L3 transfer with regard to HSs, the aim of the present study is to address the following two research questions:

i.   Is AoO in the dominant language of HSs related to accent strength or accent source in L3 English?
ii. Is there any relation between language dominance in early bilinguals and accent strength or accent source in L3 English?

3.   Participants' profiles

The data used for the present study was gathered in 20-minute-long, loosely pre-structured naturalistic interviews, conducted by native speakers in each language.

3.1 Participants

The participants were 18 adult German-Turkish bilingual speakers aged between 20 and 42 years ($M = 25$) (see overview in Table 2). At the time of testing, they were living in Hamburg, Northern Germany. Most were born in Northern Germany (two in Turkey), and all spoke standard varieties of German and Turkish. All acquired Turkish from birth, and Turkish was the predominant language in their homes when they were growing up. Their parents were native speakers of Turkish from Turkey, and Turkish was the language that they mostly used with one another. Interaction between the participants and their parents was typically in Turkish; with their siblings they spoke German and Turkish. Some bilinguals reported increasing use of German at the expense of Turkish after age 6 when they started German school.

At the time of testing, all bilinguals held German high school diplomas (corresponding to *"Gymnasium"*) and most used more German than Turkish. They generally felt at ease using both languages, while considering themselves to be more proficient in German. In the study, participants were required to stipulate their "first *intensive* contact" with German. Living in Germany, their "first contact" of course occurred at a younger age, but was limited to passive exposure. For the purposes of this paper, we equate this self-reported age of first intensive contact with AoO. Accordingly, participants could be divided into two groups, namely simultaneous bilinguals (2L1s) with an AoO between 0–3 years ($n = 10$), and early

L2 learners (eL2s) with an AoO between 4–7 (n = 8) (see Table 1 for details). We are mentioning this to illustrate the extent to which participants differ in terms of AoO in German without implying a sensitive period for phonology dividing these two types. We will not use this division in any of our analyses further below (see also footnote 8).

Exposure to L3 English began for all bilinguals at school between age 8 and 12 (M = 10). English is the first foreign language at German schools and in the first two years it is taught up 5 hours per week, and later at least 2 hours per week, depending on school and specialization. Most participants had spent no longer than 6 weeks in an English-speaking country. All bilinguals were proficient enough to comfortably hold a 20–30 minute conversation on a number of topics, though self-estimated proficiency ranged from "beginner" to "advanced".

3.2 Language dominance

Since it is not yet clear whether language dominance is relevant for transfer into L3 at all (including skills beyond phonological ones), and if it is, which aspects thereof, we investigated the potential impact of two types of dominance measures separately: input frequency and use, and language proficiency. For proficiency, we will analyze *phonological* proficiency as perceived by native speakers (see 3.2.2) because it is *phonological* transfer that we are interested in. For relative language input and use, German was the language of the environment for all speakers at the time of testing, and they all used and heard German more frequently than Turkish outside their homes. However, the bilingual speakers differed considerably in their contact with Turkish over the years, which is why we focused on this aspect. In the following, we explain how frequency of L1 Turkish use was operationalized.

3.2.1 *Use-based dominance: Turkish use scores*
All participants filled out a questionnaire providing information about their use of German, Turkish, English and other languages. Based on the information on Turkish, we calculated a score representing the quantity and quality of their contact with Turkish in the past and at the time of testing (in the following referred to as "TUS" for "Turkish Use Score"). The information that score is based on pertains to the four main categories in Table 1.

Some factors were weighted more heavily (indicated in brackets), as they were believed to have greater impact, for example Turkish schooling, types of contact with Turkish, and stays in Turkey.

Table 1. Information used for Turkish Use Score (max 23 points).

Category	Type of question
Language within family	Language of mother (1 point)
	Language with mother (1 point)
	Language of father (1 point)
	Language with father (1 point)
	Language between parents (1 point)
	Language among siblings (1 point)
	Language at home after age 6 (1 point)
Language quality	Turkish schooling (2 points)
	Types of contact with Turkish (e.g. reading, writing, etc.) (3 points)
Current language use	Relative use of Turkish vs. German (3 points)
	Language/s at work/school (1 point)
	Language in spare time (1 point)
	No. of people Turkish is spoken with (1 point)
	Relationship to people Turkish is spoken with (work, private) (1 point)
Language experience in Turkey	No. of years living in Turkey (2 points)
	No. of visits per year in Turkey (past 5 years) (2 points)

3.2.2 *Proficiency-based dominance: perceived phonological proficiency*

The data for the bilinguals' perceived phonological proficiency are taken from two separate, previous accent rating experiments, one testing the bilingual speakers' perceived accent in German and one testing their perceived accent in Turkish (see Stangen et al., 2015 for details). Here, we summarize only those aspects that are relevant for the present L3 study. The accent ratings were based on 10-second speech samples from each speaker in both languages. These samples were extracted from naturalistic interviews, and contained no indication of the speakers' linguistic and/or cultural background. The German samples were rated by 15 monolingual German speakers from Hamburg, and the Turkish speech samples were rated by 15 monolingual Turkish raters from Istanbul and Bursa. The criterion for being monolingual for both speakers and raters was that only one language was used at home during childhood and that this was the only language of instruction at school. The raters had no special training in phonetics or linguistics. (Untrained judges were shown to be equivalent to trained judges in their assessment of global foreign accent, Gallardo del Puerto et al. 2014). The speech samples

Table 2. Proficiency scores for German and Turkish, AoO for German, TUS score, and categorized L1 background group

Participant code		AoO in German	TUS score	Phon. profi-ciency German[*]	Phon. profi-ciency Turkish[*]	Categorized L1[**]
1	DUY	3	7	14	1	G
2	ARZ	7	7.5	11	4	G
3	TUL	5	9.5	13	2	G
4	SIB	3	10	13	3	G
5	YAS	0	10.5	13	8	M
6	SAN	5	11.5	14	7	G
7	ALT	4	11.5	5	1	G
8	CIG	1	12	15	8	G
9	MUR	4	12	15	8	M
10	BUR	2	14	2	11	M
11	HAK	4	14	15	13	G
12	AYS	6	14	12	11	M
13	SEV	3	15	14	2	G
14	GUL	1	15.5	1	15	M
15	GOK	3	15.5	13	12	G
16	PIN	3	16	12	12	M
17	ULK	6	16	2	13	M
18	EME	3	17	2	13	M

[*] For proficiency, the higher the score, the lower the degree of detected (rated) foreign accent in that language.

[**] The information in this column will be explained in Section 4.3.3.

were presented to the raters by means of a PowerPoint presentation with instructions, and the raters were explicitly told to judge regional accents as native-like. The raters were asked to listen to a sample of 10 seconds and decide whether the speaker sounded native or foreign.[9] We take the results to be indicative of phonological proficiency.

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9. Strictly speaking, this was not only a binary decision task. Raters were further asked to specify how certain they were in their decisions (certain/semi-certain/uncertain); see Stangen et al. (2015) for further details.

Table 2 illustrates the results, showing how many raters (out of 15) considered each individual speaker to be native in his/her two languages.[10] The table also provides the participants' TUS score and their AoO for German. The information provided in the far-right column will be discussed in Section 4.3.3.

The next phase of our study concerns the bilinguals' perceived accent and perceived transfer source in L3 English. To this end, 20 English native speaker judges rated each bilingual speaker based on a 15-second sample taken from the English-language interviews. The exact procedure is explained in the following.

4. L3 English study

4.1. Speakers and raters

Four sets of speakers participated in the accent rating study: the 18 bilingual speakers introduced in Section 3.1, and three control groups including five monolingual speakers each of English, Turkish, and German. The English group consisted of speakers from England, Ireland, Canada, the USA, and South Africa; the five Turkish monolinguals were recorded in Istanbul and the five German monolinguals in Hamburg. The Turkish and German controls were selected randomly with an added criterion of excluding samples which (i) contained a high number of morphosyntactic errors or (ii) were mistaken for native speakers of English in the piloting phase. This pre-selection ensured that raters would have representative models for the German, Turkish, and English accents without the distraction of grammatical errors.

The raters were 20 native speaker English teachers aged between 25 and 61 ($M = 37.6$) from the United Kingdom, North America, Australia and New Zealand, and Ireland. All teachers but one had a minimum of 3 years teaching experience, and held either a teaching diploma ($n = 4$), or a teaching diploma and a university degree ($n = 16$). All had a working knowledge of phonetics and phonology, thus being familiar with the basic terminology required for describing pronunciation difficulties. The vast majority of teaching experience was gathered in Germany, and the average length of residence in Germany was 11.6 years (range = 1–35 years). Consequently, the level of German was generally very high, with 17 participants estimating themselves as B2/Upper Intermediate or higher. None of the raters spoke Turkish.

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10. We are aware that this is not a perfect measure, because speakers, even if they have a foreign accent, can be more or less close to a native-speaker level. However, we take it as the best approximation available to us and preferable to self-rated proficiency.

The decision to use linguistically-trained native speaker judges was based on piloting for the current study, in which English teacher native speakers correctly determined the speaker's L1 more frequently than German-speaking students of linguistics. Moreover, it has been suggested that native speaker judges with training in linguistics are better at recognizing deviations from their own native standard than non-native judges (Jesney, 2004), though see Flege (1988) and Højen (2000) for a different view.

4.2. Methods

4.2.1 *Preparation of speech samples*

The 15-second speech samples were extracted from naturalistic interviews and selected based on their degree of fluency and lack of grammatical errors. We used naturalistic speech samples (as compared to read speech, for example) because it is ecologically more valid, that is, more natural and closer to real-life situations. The topics included books or films, travel, and work/university. Some minimal manipulations were carried out to allow for better comparability between the samples and to help raters focus on accent and not on grammatical correctness, including the reduction of long pauses, repetitions, and fill words, and the regulation of volume. Finally, the 33 samples (18 bilinguals, 15 controls) were integrated into a PowerPoint presentation in a semi-randomized order. Three versions of the presentation with a varying sample order were implemented to counter potential effect of lapses in raters' concentration.

4.2.2 *Procedure*

During the experiment, raters were instructed to 1) listen to the speech sample; 2) rate it for global accent on a scale from 1 (no foreign accent) to 7 (strong foreign accent); 3) request a second listening if necessary; 4) determine the speaker's L1 from a list of options (German, Turkish, English, None of these (see Figure 1)); and 5) describe the salient features of the accent. The second listening option was provided because raters had not always been able to provide answers after a single listening in the pilot study. In Step 4, when raters chose none of these, they were given the opportunity to provide another L1. The presentation contained pre-recorded audio instructions and was played to raters on the interviewer's computer. Before commencing, raters completed a training session entailing three practice ratings. This served firstly to familiarize raters with the experiment and secondly, to provide a benchmark for accent strength and thereby encourage a wider use of the Likert-scale. Raters' answers were noted by the interviewer on a rating sheet, and each rating session was recorded on a digital recording device. The task took

on average 43 minutes (range = 35–59 minutes) to complete and was followed by a two-page sociolinguistic background questionnaire.
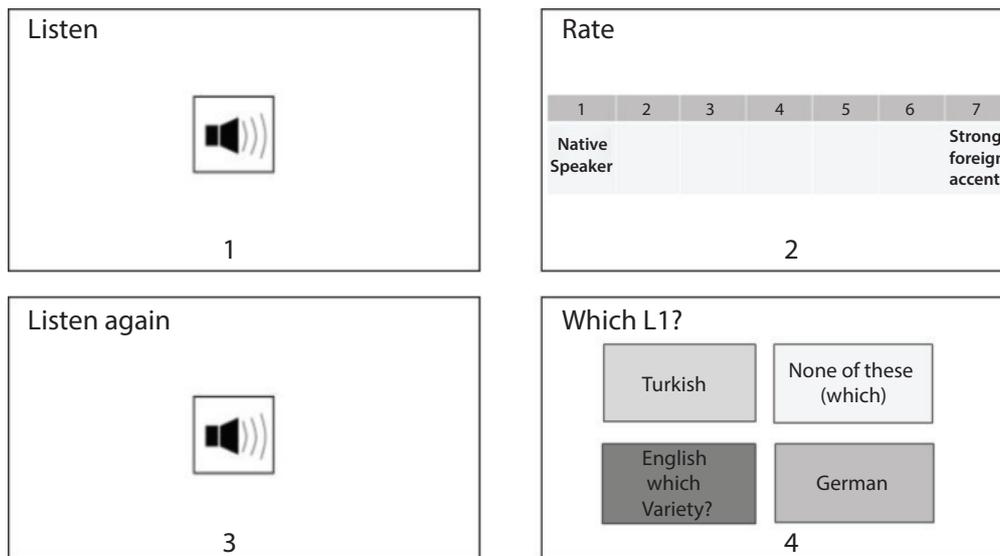

Figure 1. Experimental design for the accent rating task

4.3. Results

4.3.1 *English accent strength*

To begin with, we present descriptive statistics for the L3 English accent rating study. The Likert ratings of the 33 participants by the 20 raters were highly reliable as a scale, as evidenced by a Cronbach's Alpha of .98. The L1 English control group was rated as the least accented with a mean score of 1.13 (*SD* .16) (1 = no foreign accent; 7 = strong foreign accent). This means that the raters were capable of accurately identifying English spoken by native speakers. The group with the highest accent rating was the L1 Turkish speaker control group, whose mean score was 4.80 (*SD* .68). The two remaining groups, the L1 German control group and the Turkish-German bilingual group, were rated fairly similarly, with means of 3.57 (*SD* .58) and 3.71 (*SD* .84), respectively. The group means for perceived accent strength are visualized in Figure 2 as error bars with associated 95% confidence intervals.
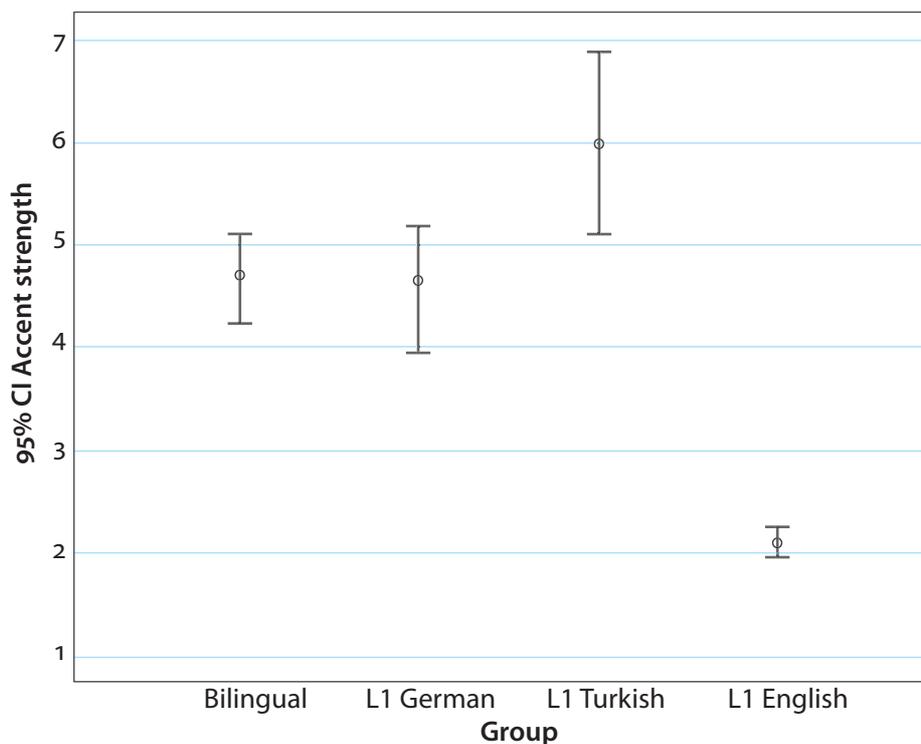
Figure 2. Error bars for accent strength means per group.

In Figure 2, the group means are illustrated by the circles and the confidence intervals by the vertical bar itself. For example, the sample mean for the bilinguals is 3.71 whereas the estimated population mean for that group is likely to fall between 3.3 and 4.2. There is considerable overlap in the error bars of the bilinguals and the L1 German groups, indicating that these samples are unlikely to come from different populations. In order to find out whether the group means differed from one another, an ANOVA was performed. As the assumption of homogeneity of variance was violated, two alternative F-ratios were calculated: Brown-Forsythe and Welch. In addition, a Games-Howell post hoc test was used as it is also considered accurate when sample sizes are unequal (Field, 2005: 341, 346). There was a significant effect of group on accent strength ratings, Welch F (3, 9.85) = 98.29, $p < .001$, and Brown-Forsythe F (3, 15.86) = 39.06, $p < .001$. The post hoc test revealed that all pair-wise comparisons were significant at least the level of $p < .05$, except for that between the bilinguals and the L1 German group ($p = .970$). In terms of perceived accent strength in English, no significant difference existed between the bilinguals and the L1 German control group.

Thus, our results so far seem to indicate that in terms of accent strength the bilingual participants are more similar to L1 German speakers than L1 Turkish speakers, and they are not disadvantaged compared to any group of L1 speakers (except L1 English speakers, of course). Given that the bilinguals are similar to the L1 Germans in terms of accent strength, it may seem reasonable to surmise that their accents also sounded alike. However, results from the L1 identification task (Section 4.3.3) do not confirm this assumption.

4.3.2 *Relationships between L3 English accent strength and L1 dominance*

In the next analysis, we investigated whether a relationship existed between any of the three language dominance measures introduced in 3.2 above and the accent strength ratings in L3 English (FASL3) for the bilingual group. We were also interested in whether AoO of German was related to FASL3. These variables are briefly described in Table 3.

Table 3. L3 English Foreign Accent Strength, L1 language dominance variables and AoO

Measure	Description
Foreign Accent Strength in L3 English (FASL3)	The higher the mean score, the stronger the perceived foreign accent (min 1, max 7)
Language Dominance — Turkish Use Score (TUS)	Score based on self-reported Turkish use, calculated according to the system accounted for in Section 3.2.1. The higher the score, the more reported use of Turkish (min 0, max 23)
Language Dominance — based on rated phonological proficiency in German (GPP)	Score based on raters' perceived presence of a foreign accent in the participants' spoken German (see Section 3.2.2). The higher the score, the less foreign accented (min 0, max 15)
Language Dominance — based on rated phonological proficiency in Turkish (TPP)	Score based on raters' perceived presence of a foreign accent in the participants' spoken Turkish (see 3.2.2). The higher the score, the less foreign accented (min 0, max 15)
Age of onset of acquisition in German (AoO)	Self-reported AoO in German

First, the three dominance scores and the AoO score were plotted against the FASL3 score (see Figures 3–6).
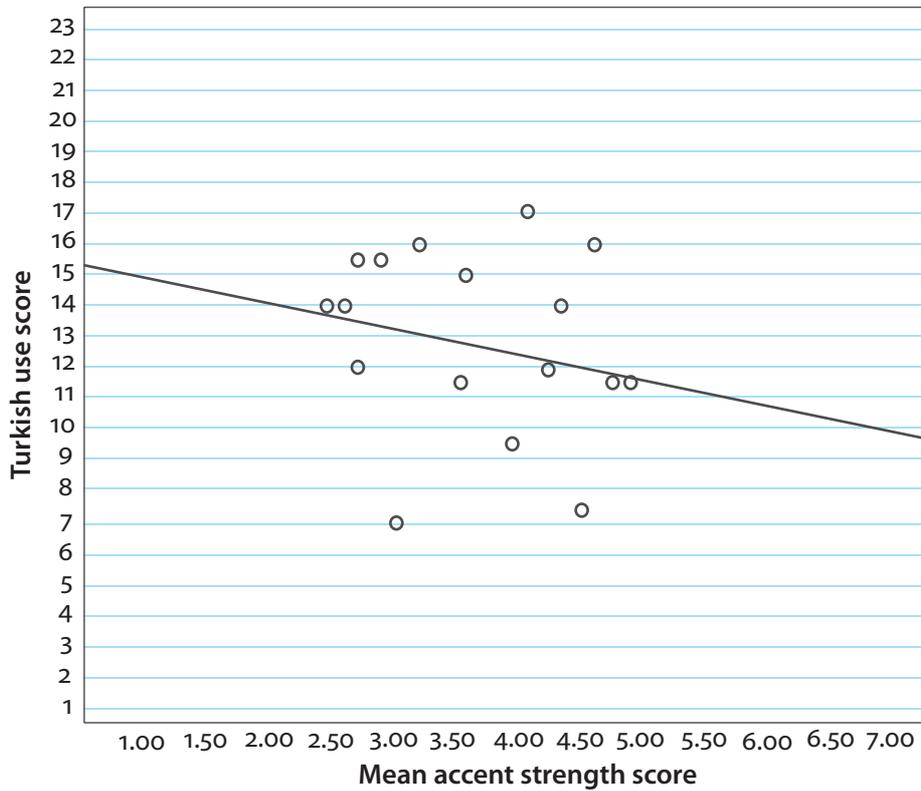
Figure 3. Turkish use score (TUS) (Y Axis) plotted against rated accent strength score in L3 English (FASL3) (X Axis), $r = -.14$.
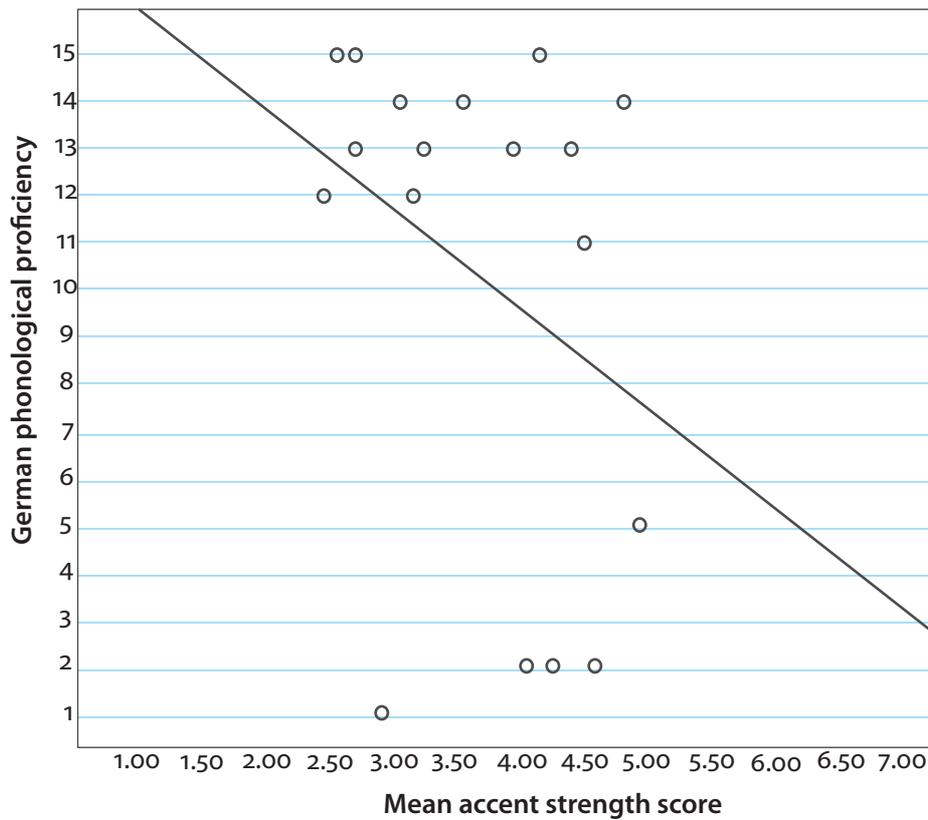

Figure 4. Rated phonological proficiency in German (GPP) (Y Axis) plotted against rated accent strength score in L3 English (FASL3) (X Axis), $r = -.21$.
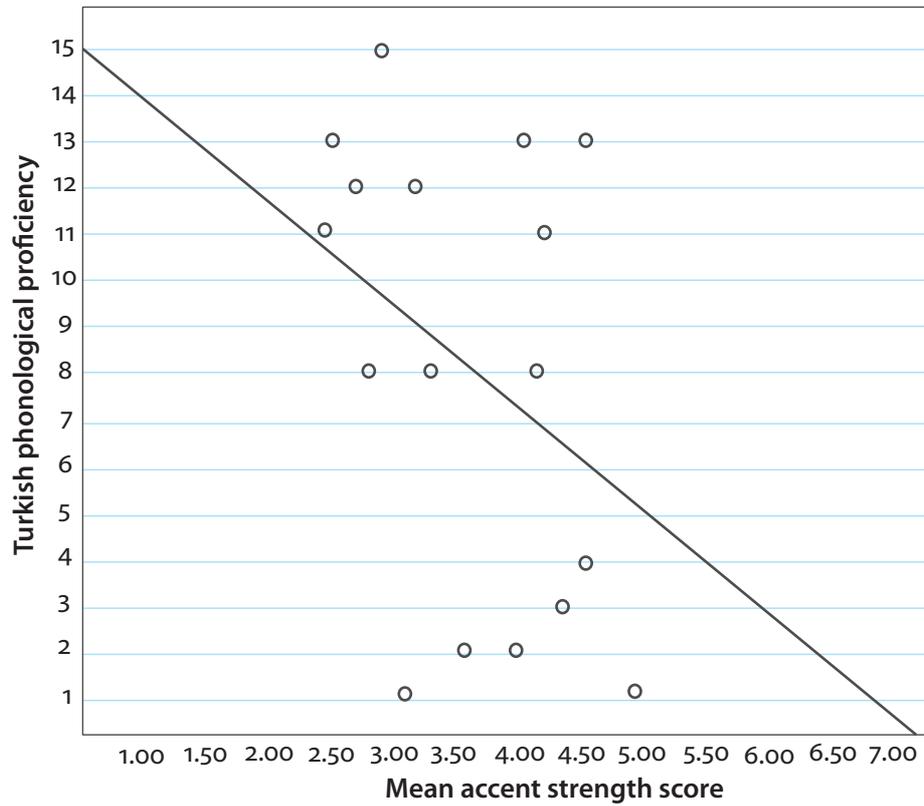
Figure 5. Rated phonological proficiency in Turkish (TPP) (Y Axis) plotted against rated accent strength score in L3 English (FASL3) (X Axis), $r = -.24$.
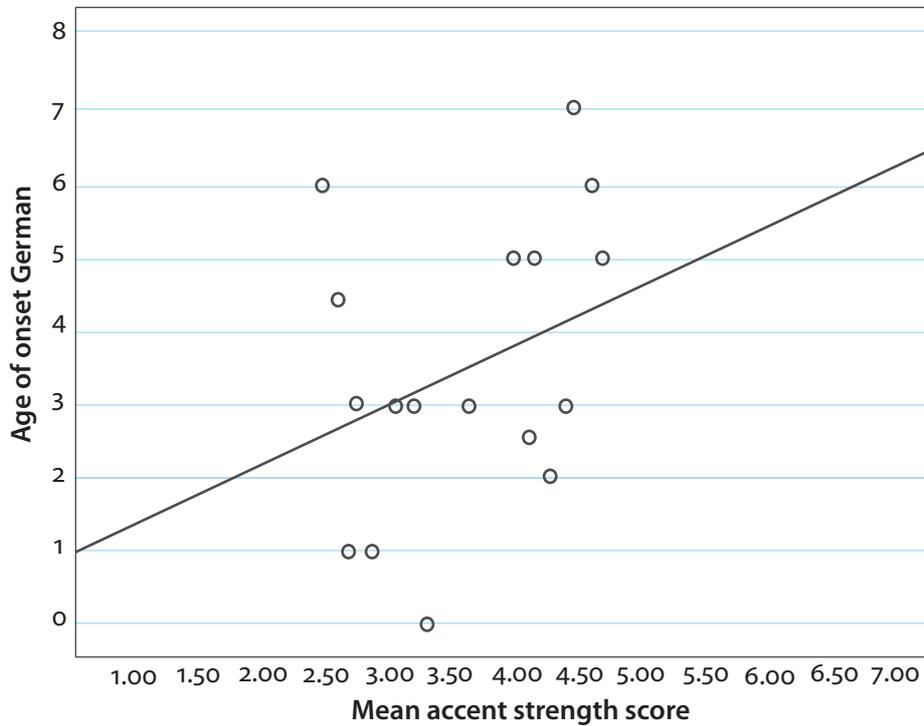

Figure 6. Age of onset of acquisition of German (AoO) (Y Axis) plotted against rated accent strength score in L3 English (FASL3) (X Axis), $r = .20$.

Figure 3 indicates a trend where the more Turkish the participants reported using, the lower the score (=less foreign accented) for foreign accent in L3 English. Figure 4 indicates that the higher perceived phonological proficiency when speaking German, the lower the score (=less foreign accented) for foreign accent in L3 English. The plot in Figure 5 indicates that the higher perceived phonological proficiency when speaking Turkish, the lower the score (=less foreign accented) for foreign accent in L3 English. Finally, Figure 6 indicates that the later the German AoO, the higher the score (=more foreign accented) for foreign accent in L3 English. As a next step, correlation coefficients were computed for the data sets behind the plots in Figures 3–6. Since the data set was quite small (N = 18), and there were many tied ranks in the data, a non-parametric Kendall's tau correlation was used (Field, 2005: 131). The obtained coefficients are reported in Table 4.

Table 4. Correlation coefficients (Kendall's tau, N = 18) between the three language dominance scores, AoO of German, and the Global Foreign Accent score for L3 English.

	TUS	GPP	TPP	AoO German
FASL3	−.14	−.21	−.24	.20
TUS		−.26	−.66**	−.13
GPP			−.28	.06
TPP				−.11

** $p < .01$, two-tailed.

Only one correlation was significant, namely that between the Turkish use score (TUS) and the rated phonological proficiency in Turkish (TPP) (see also Table 2 for individual participants' scores). This negative relationship indicates, perhaps not surprisingly, that the more use of Turkish reported, the less detectable foreign accent was observed in the participants' spoken Turkish. No other correlation was statistically significant, however a slightly higher relation was found between perceived phonological proficiency in Turkish (TPP) and the foreign accent strength score (FASL3) (−.24) than between perceived phonological proficiency in German (GPP) and the Foreign Accent Strength (FASL3) (−.21). However, such tiny differences are arguably negligible here. AoO of German correlated with the FASL3 score at a similarly low level (.20). What this shows is that high proficiency in both L1 and L2 leads to greater phonological skills in L3, no matter at what age the majority language (German) was acquired.

Thus, despite some emerging trends in Figures 3–6, no statistically significant relationships were observable between the dominance scores and foreign accent strength. It is worth noting the lack of (statistical) relationship between the amount of Turkish use (TUS) and German phonological proficiency (GPP), indicating that

more use of Turkish during early childhood does not have a non-facilitative impact on the development of German phonological proficiency.

4.3.3   *Ascertaining L3 accent transfer source*

In this analysis, in line with our second RQ, an attempt was made to ascertain the transfer source in the 18 bilinguals' spoken L3 English. Thus, if an accent was detected in their spoken L3 English (which was the case in all but 3 of 180 L1 identification ratings), which of their two early languages is likely to be the source of transfer? The method employed here was to take information from the L1 identification task, in which the 20 raters were asked to determine which L1 they believed each speaker to have, with a choice between German (G), Turkish (T), English (E), or None of these (N) (see Section 4.2). The raters were very capable of identifying L1 German and L1 English speakers, whom they identified at 80% and 91%, respectively, while being less successful at identifying the L1 Turkish speakers, who were identified as "T" in just 47% of the ratings, but equally often as "None of these" (see Table 5).

Table 5. Proportion of stipulated L1s in the L1 identification task

	Identified as			
	L1 German	**L1 Turkish**	**L1 English**	**None of these**
Bilinguals (*n* = 18)	216 (60%)	66 (18%)	3 (1%)	75 (21%)
L1 Germans (*n* = 5)	80 (80%)	6 (6%)	1 (1%)	13 (13%)
L1 Turkish (*n* = 5)	6 (6%)	47 (47%)	0 (0%)	47 (47%)
L1 English (*n* = 5)	7 (7%)	0 (0%)	91 (91%)	2 (2%)

The L1 identification results were more mixed for the bilinguals (60% "G", 18% "T", 21% "N" and 1% "E"). Recall that when raters chose "N", they had the opportunity to specify another L1. Although a wide range of languages was named, there was a noticeable tendency to name Swedish or Danish for the L1 German speakers (6 comments), and Polish, Russian or Ukrainian for the L1 Turkish speakers (25 comments) — yet never the other way around. It would therefore appear that raters associated the Turkish accent with Polish, Russian and Ukrainian, and the German accent with Swedish and Danish.[11] Based on the consistency of these as-

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11. The reasons for which the raters associated Swedish and Danish with German, and Polish, Russian and Ukrainian with Turkish can only be a matter of (anecdotal) speculation. The accent rating experiments in which the early bilinguals were judged when speaking Turkish and German (Stangen et al., 2015) revealed that raters often based the identification of a foreign accent on rhythm and intonation rather than on segmental properties. It is unlikely that these two properties (alone) also led to classifying the bilinguals as Swedish, Russian etc. when speaking

sociations and to avoid losing data to the None of these option, we relabeled the 6 instances where Swedish or Danish were named as "G", and the 25 instances where Polish, Russian or Ukrainian were named as "T". This relabeled data is reported in Table 5. The result could be taken to mean that the bilinguals exhibited features of both L1 Turkish and L1 German. Based on this information, each of the 18 bilingual participants was classified as belonging to one of the following two groups:

I.   G (for German) = perceived transfer from German
II. M (for Mixed) = perceived transfer from Turkish or other L1, but not German or English

The group membership was determined by the frequency with which each bilingual speaker was identified as L1 German, with speakers who were identified as "German" in at least 12 out of 20 ratings being attributed to Group G ($n = 10$), and speakers with less than 12 "L1 German" ratings being attributed to Group M ($n = 8$). This criterion was based on results from the German control group, in which all five speakers were correctly identified as L1 German in at least 15 out of 20 ratings ($M = 16$). We did not use a three-partite categorization (English/German/Turkish) because no speaker was predominantly classified as "N" or "T". Instead, most participants who were deemed "T" comparatively often were also classified as "N", possibly because the raters were generally unfamiliar with Turkish accent. We admit that this classification can only be an approximation to the speakers' accent profiles, because no speaker, except for native English speakers, was ever labelled with the same transfer source by all 20 raters.

The relation between the proficiencies in German and Turkish, respectively, and the categorization of perceived L1 is shown in Table 2 (Section 3.2.2). The values in the table indicate that the bilingual participants with a lower phonological proficiency in Turkish were categorized as being L1 German. Those bilingual participants with a higher phonological proficiency in Turkish, however, were predominantly categorized as being L1 Turkish or Other L1. As for the proficiency scores for German, the pattern is less clear, since participants with equally high scores were classified as either German or Turkish/Other L1. Furthermore, a low German score often led to being classified as Turkish/Other L1.

English. For example, Swedish has tones on the word level; thus, Swedish intonation is very different from that of other Germanic languages. As for rhythm, the Germanic languages are stress-timed and Turkish is syllable-timed, but Russian is also stress-timed like German, which makes it unlikely that Russian is mistaken for Turkish (rather than German) because of rhythm. An alternative explanation is that Scandinavians (unlike Germans) have the reputation of speaking very good English. Therefore, a highly proficient German speaker can be mistaken for a Swedish or Danish speaker.

In order to investigate whether the participants' group membership (outcome variable, G or M) could be predicted based on the proficiency scores from German and Turkish, respectively, and the Turkish use scores and German AoO (independent variables), we ran a binary logistic regression analysis. As an initial step, we created a single model with all four predictors, using a "forward" method. This was done as the analysis could at best be considered as exploratory model building. We used "categorized as having a German L1" as our binary outcome (yes, no) and phonological proficiency in German (GPP), phonological proficiency in Turkish (TPP), Turkish Use Score (TUS) and Age of Onset of acquisition in German (AoO) as predictors. The resulting model identified TPP as the only significant predictor, correctly classifying 77% of the bilinguals, with 80% accuracy for those categorized as German L1 and 75% accuracy for those categorized as Turkish or other L1 (but not German or English). Table 6 below summarizes this model.

Table 6. A binary logistic regression model (significant predictor: Turkish phonological proficiency; outcome: German L1 (yes, no)).

		95% CI for exp b		
	B (SE)	Lower	exp b	Upper
Included				
Constant	3.87 (1.89)			
Turkish phonological proficiency (GPP)	−0.42 (.19)	.46	.66	.95

Note R^2 = .40 (Cox & Snell), .53 (Nagelkerke). Model χ^2 (1) = 9.10, p = .003.

The value of exp b in Table 6 can be interpreted in terms of change of odds. With a value smaller than 1, we can conclude that as the predictor increases, the odds of the outcome occurring decrease. Thus, the higher the phonological proficiency in Turkish, the lower are the odds (.66 times lower) that an individual be classified as L1 German. Furthermore, with the confidence interval for exp b ranging between .46 and .95, we can be fairly confident that the population value lies within that range. None of the other three predictors had residual chi-square coefficients significantly different from zero, at p = .521, with individual predictor significance values as follows: GPP p = .164, AoO p = .683, and TUS p = .887. Consequently, none of those further variables were added to the model. However, as a sample size of > 15 participants per predictor is often recommended as a rule of thumb in the literature on logistic regression (see, e.g., Field, 2005), we also carried out separate logistic regression models for each of the four predictors. In all models, an "Enter" method was used. As expected, the model with Turkish phonological proficiency as predictor again reached significance, but none of the other three predictors did (Model for GPP, χ^2 (1) = 5.25, p = .022. Predictor p = .054; Model for TUS, χ^2 (1) = 5.48, p = .019. Predictor p = .050; Model for AoO, χ^2 (1) = .57,

p = .449. Predictor *p* = .457.). It is worth noting that both the variables of GPP and TUS approached significance in these single predictor models. However, as the confidence intervals for the exp *b* values in these latter models in both cases ranged from less than 1 to more than 1, we have to be cautious when interpreting these findings as they may indicate either a positive or a negative relationship in the population (Field, 2005: 254).

In summary, in the regression model with multiple predictors, the only statistically significant predictor of perceived L1 membership was the Turkish proficiency score, whereas both the German proficiency score and the Turkish use score approached significance as predictors, while German AoO was clearly non-significant, when running separate regression models for each predictor.

5. Discussion

This study aimed at investigating the relationship between AoO in the majority language of HSs (here: German) and perceived accent (strength and source) in L3 English, as well as the relation between language dominance in HSs (operationalized as perceived phonological proficiency and Turkish use) and perceived accent (strength and source) in L3 English. As for accent strength, the German controls and the HSs received almost identical ratings in L3 English, more moderate than the L1 Turkish controls. There further seemed to be a relation between the three language dominance measures (TUS, GPP, TPP) and accent strength in L3 English, but it did not reach statistical significance. When dividing the HSs into two groups based on their perceived L1 in L3 English (L1 German or L1 Turkish/ None of these), pattern-wise, HSs with a high phonological proficiency in Turkish were categorized predominantly as Turkish/None of these, whereas a high proficiency in German hinted at an L1 German background. Nevertheless, only phonological proficiency in Turkish could significantly *predict* group membership in L3. Similarly, the amount of Turkish use seemed to be related to perceived accent in L3 English, but the relation did not yield significance. Perceived accent strength and accent source in L3 English were unrelated to AoO in German.

In the following discussion, we will highlight three points, which, from our perspective, are the major outcomes of our study, given our research questions. These include AoO in German, and, in relation to that, the L2SFM (5.1.), language dominance (5.2.), and implications for other L3 transfer models (5.3.).

5.1. Age of onset and the L2SFM

So far, research on L3 transfer in early bilinguals has not systematically addressed the question whether AoO in two early acquired languages is related to the degree of accent or the accent source in L3. However, according to some models, AoO may determine the way linguistic knowledge is cognitively represented, which is why such a relation might be expected (Paradis, 2009; Bardel & Falk, 2012).

To begin with, our analysis showed that AoO in German was unrelated to perceived phonological proficiency in German, contrary to previous research showing that the ability to acquire a foreign language declines beginning after age 3 (although the ability to create new categories never completely deteriorates) (e.g., Flege et al., 1995; Abrahamsson & Hyltenstam, 2009). In our study, there were bilinguals with an AoO *after* age 4 ($n = 8$) who developed a monolingual-like accent in German, and bilinguals with an AoO *before* age 3 ($n = 10$) who were deemed foreign speakers of German. Moreover, while it might be speculated that earlier contact with the majority language prevents the heritage language from developing independently, thus fostering a foreign accent in Turkish, our results do not support such a relation either: earlier contact with German did not necessarily lead to a foreign accent in Turkish. Instead, the amount of Turkish use (TUS) was linked to phonological proficiency in Turkish, suggesting that input frequency may override AoO when it comes to the maintenance of heritage languages. This finding, that is the fact that L1/L2 use rather than AoO alone is crucial for the perception of foreign accentedness, ties up nicely with earlier conclusions reached by Flege and MacKay (2011). Given these findings, it is not surprising that L3 accent was not related to AoO in German either.

Our findings may not have direct bearings on the L2SFM because Bardel & Falk (2012) based the L1/L2 distinction on the type of learning (implicit vs. instructed), and type of knowledge (procedural vs. declarative) rather than AoO alone. Our HSs' L1 and L2 knowledge may both be linked to implicit procedural memory because the L2 was acquired in a naturalistic setting. Moreover, in our understanding Paradis (2009) is not generally opposed to the idea that explicit knowledge can be replaced by procedural at some point. Since our learners are relatively proficient in their three languages, it is possible that they draw on procedural knowledge in all three languages which could lead to multi-directional influence.

Alternatively, L1 and L2 acquisition could be defined with reference to a sensitive period, independent of the type of learning. Consequently, there might be age effects in L3 in terms of accent strength (e.g., early AoO in German leading to milder L3 accents than late AoO in German) or perceived transfer source (early acquirers of German sounding German, late acquirers of German sounding

Turkish, or vice versa). Our results support none of these possibilities, not surprisingly, because even AoO in German and phonological proficiency in German or Turkish were unrelated. Thus, similar to what has been argued for L2 acquisition (e.g., Birdsong, 2003; Bongaerts, 1999), our results challenge the assumption that AoO alone is crucial in determining a perceived accent later in life, both regarding the early acquired languages and any late acquired foreign language.

5.2. Language dominance

The results seem to suggest that phonological proficiency in German and Turkish and Turkish use in some way determined whether the HSs were predominantly categorized as German or non-German (i.e., Turkish or None of these) when speaking L3 English. However, the question is why phonological proficiency in Turkish turned out to be the only significant predictor of the perceived L3 accent source. To begin with, we hesitate to interpret a non-significant relation to mean "no relation". In fact, both the link between German phonological proficiency and Turkish use with L3 accent source were marginally significant, but admittedly with little room for generalizing findings to an underlying population. Further, amount of Turkish use was significantly related to phonological proficiency in Turkish, which makes the absence of any relation between Turkish use and L3 accent source implausible. Second, a problem was that our raters did not identify Turkish accent reliably. Third, in our final analysis, we to some extent forced our bilinguals into L1 categories. This may obscure the fact that, unlike the L1 controls, most HSs were not attributed to the same L1 category by all raters. Rather, some bilinguals were categorized as L1 German, L1 Turkish, L1 English and None of these by raters who reliably identified L1 English and L1 German accents in the control samples. Moreover, a number of raters commented that individual speakers had neutral though foreign accents, but nevertheless tried to opt for a particular L1 category. Finally, some raters remarked that individual speakers may have been German or Turkish or, when explaining why they opted for a particular L1 category, mentioned accent features that are typical of German *and* Turkish speakers. Overall, this seems to suggest that HSs are likely to transfer from multiple sources, though being more inclined to transfer from the language they are most proficient in.

5.3. Implications for other L3 transfer models

We have commented further above on the potential implications of our results for the L2SFM in relation to AoO. Unlike the L2SFM, the TPM is oblivious to AoO, predicting that learners transfer from the typologically closest language at the initial stages of language acquisition. Our results may not speak to the TPM directly

since we did not investigate initial state learners. Furthermore, we loosely defined typological proximity based on perceived or genealogical distance, but defining it on actual structural (i.e., phonological) similarities may give us a slightly different picture with German and English being more distant than intuitively assumed. The details are not essential here, since no matter how we define typological proximity, the TPM alone, *without any additional assumptions*, would predict a *common* transfer source for all bilingual learners who know the same languages. Our results indicate, however, that only some of the bilinguals are predominantly perceived as German, while others are perceived as non-German. The fact that our raters could not identify the accent source of each individual bilingual does not invalidate/weaken these findings, since the raters identified L1 German speakers reliably, while attributing a German accent only to some bilinguals. The reason for multiple transfer sources may be that our bilinguals have moved beyond the initial state, and it remains a possibility that they transferred from German at the initial stages. Alternatively, as suggested by Rothman (2015), early bilinguals may be driven by cognitive economy to a greater extent than monolinguals. They would not need to transfer either the L1 or L2 completely as a function of more bilingual experience and the growth of inhibitory control. Rather, they might transfer more selectively, namely only when the effects are beneficial, much in the sense of the CEM. The result would be more neutral accents, making it harder to identify them as L1 speakers of one particular language, as we outlined in the preceding paragraph.[12]

The CEM postulates that any previously acquired language will be beneficial to foreign language acquisition (Flynn et al., 2004). Consequently, bilinguals should have an advantage over monolinguals. Our results indicate that early bilinguals are *not disadvantaged* compared to monolinguals, because their accents are perceived to be similar in strength to those of L1 German speakers, and milder than the accents of L1 Turkish speakers. Put differently, although the raters perceived L1 Turkish accents in L3 English to be stronger than L1 German accents, the bilinguals, despite speaking Turkish besides German, were not perceived to have stronger accents in L3 English than L1 German speakers. By implication, their knowledge of Turkish did not affect their accents in English negatively. These results are in line with previous findings and suggestions in the literature. Though not explicitly related to HSs, Gut (2010) and Marx and Mehlhorn (2010) suggested that multilinguals have learning advantages over monolinguals since they possess a larger phonological repertoire and a higher degree of metalinguistic awareness.

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12. Of course, the question arises as to which other foreign languages the bilinguals knew and whether they might have transferred from these languages. Due to limitations of space, we cannot discuss this question in further detail.

This was confirmed for general multilingual linguistic experience by Enomoto (1994) and Beach (2001) for perceptual performance in L3 Japanese and L3 Thai, and for specific linguistic experience in an ERP experiment by Tremblay (2010). Evidence to the contrary was found by González Ardeo (2001) and Gallardo del Puerto (2007).

Moreover, it has been suggested that bilinguals surpass monolinguals in the completion of specific cognitive tasks, for example in their ability to resolve conflicting information by inhibiting the misleading source (Bialystok, 2012: 425). A similar conclusion was reached by Gallardo del Puerto (2007) in relation to Cummins' (1984) CALP (cognitive academic learning proficiency) and BICS (basic interpersonal communication skills) distinction. He suggests that a bilingual advantage would be more apparent in linguistic areas that depend on cognitive development (CALP) but not necessarily in areas that are less related to cognitive maturation (BICS), such as pronunciation.

6.   Conclusions

Our study showed that early bilinguals, unlike monolingual L1 speakers, constitute a heterogeneous group when it comes the perceived transfer source in their accents. The majority (60%) were predominantly perceived to be speakers of German, which we take to imply that they transferred phonological properties mostly from German. Turkish was the perceived accent source less often (18%), possibly because our raters were unfamiliar with Turkish accents. In 21% of all cases, the raters did not perceive a German, Turkish or English accent. Remarkably, not all bilinguals were deemed L1 speakers of German, although they had learnt English in a German school setting where they were subjected to German-accented English spoken by their teachers and peers. A potential weakness in our assessment was the raters' non-familiarity with Turkish accents. In order to obtain a more balanced picture of the Turkish-German bilinguals' global accent in L3 English, and to determine whether the cases of "unclassified" accents are neutral or Turkish, it seems imperative that this study be repeated with English teachers based in Turkey. But despite this potential methodological weakness, and given that the raters determined German and English accents with high reliability, it seems fair to conclude that there was no common accent source for the HSs. Finally, those HSs who were not identified as L1 speakers of German were the more proficient speakers of Turkish, pointing to a relation between phonological proficiency in L1/L2 and accent source.

At first sight, the results seem to contradict the two predominant models on transfer source in L3, L2SFM and TPM. However, as discussed, L2SFM does not

necessarily predict that one of the two languages of early bilinguals is the transfer source because both languages are acquired in a naturalistic fashion and—from the perspective of the L2SFM—neither would count as an "L2". The TPM predicts (complete) transfer from the typologically closest language at the initial state. While we did not find uniform transfer, our results could be seen as compatible with the TPM, if we assume transfer from German, the typologically closest language, by default, unless proficiency in another language is so strong that structure-based transfer will be overridden by proficiency-induced transfer. This not explicitly stated by the TPM but it could be an auxiliary hypothesis which comes into play when we are dealing with more advanced learners. Alternatively, early bilinguals may simply be more likely than late bilinguals to use multiple transfer sources. Finally, AoO in the HSs' majority language was not related to perceived accent strength or transfer source in L3 English, which is at odds with the idea that age of learning is crucial for phonological proficiency later in life. We acknowledge that these latter conclusions are compromised by our inclusion of only early bilinguals and that we are dealing with HSs, whose AoO may depend on the speaker's own perception of exposure. Future comparisons could therefore include late bilinguals to strengthen or compromise our findings.

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