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Willingness to communicate in a multilingual context: part one, a time-serial study of developmental dynamics

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ABSTRACT

In many contexts of multilingualism, language learners can initiate communication in the target language (TL), or a contact language (such as English). Patterns of use emerging from these choices affect TL development. They also vary between individuals. Willingness to communicate (WTC) needs to be investigated in ways that capture these variations. So far, WTC has not been studied in multilingual contexts, or using individual-level longitudinal designs. Employing a single-case, time-serial design and focused on a critical period of TL growth, this study explores WTC trajectories of adult learners of Swedish for whom the TL and English provide viable communication options in community interaction. Change point and moving window correlational analyses reveal the operation of mutually interacting influences that shape WTC and have system-level effects. With light shed on processes at the developmental timescale, findings are discussed in the context of language choice, co-evolution, and the trait–state dichotomy.

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Willingness to communicate; process dynamics; language choice; migration; multilingualism; multilinguals

Introduction

Willingness to communicate (WTC) is the intention to speak or to remain silent given free choice (MacIntyre 2007, 2020). A dynamically changing state of communicative readiness, WTC fluctuates within and between communication events. In multilingual contexts, the communication choices of L2 learners involve not only speaking or not speaking, but also the language in which communication is initiated. For the multilingual language learner, situated assessments of the 'usability' of different languages – will I do better if I speak in the Lx, the Ly or the Lz – influence these choices. These assessments have particular relevance in contexts where a contact language – a language used by people who do not share a common native language or who may have different cultural frames of reference – provides a viable communication option (Canagarajah 2007; Seidlhofer 2005). In such situations, the levels of WTC for each language can provide a window into individual communicative preferences for self-presentation and interaction with other people in the local community. However, this proposition has yet to be investigated.

In complex situations such as transnational migration – where TL communication can take place in and beyond the classroom, where the initiation of communication involves making choices about which language to use, and where emerging patterns of language choice affect development – it is

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important that WTC is investigated in ways that capture variation over longer timescales. So far, WTC research has focussed on situations exclusively involving a single L2. Whereas studies have been carried out in various classroom contexts (e.g. Pawlak, Mystkowska-Wiertelak, and Bielak 2016), study abroad settings (e.g. Yashima, Zenuk-Nishide, and Shimizu 2004), and in lab conditions (e.g. MacIntyre and Legatto 2011), WTC has not been researched in community contexts. To investigate WTC (i) over a longer time window, (ii) in a community context and (iii) in relation to more than one L2, the current study takes a longitudinal, intra-individual, quantitative and process-oriented approach. In a companion article (Henry, Thorsen, and MacIntyre in press), qualitative data is used to generate in-depth, nuanced insights into the processes of change reflected by differences in observed values in the time-serial data.

Literature review

L2 WTC and trait-level research

Willingness to communicate is defined as the intention to speak or to remain silent, given free choice (MacIntyre 2007). Initially developed in the L1 context of educational instruction (McCroskey and Richmond 1991), WTC was subsequently introduced to SLA in work by MacIntyre and colleagues (MacIntyre et al. 1998; MacIntyre and Charos 1996). In the L1 paradigm, WTC is conceptualised as a trait-level disposition that 'permeates every facet of an individual's life and contributes significantly to the social, educational, and organizational achievements of the individual' (Richmond and Roach 1992, 104), and is examined as a stable individual difference. In SLA, however, conceptualizations have emphasised the complex interactions of antecedent factors, and L2 WTC is framed as a shifting state of communicative readiness (MacIntyre 2020; MacIntyre et al. 1998). In developing a heuristic model designed to account for the ways that convergences of enduring *and* situated factors underpin WTC, MacIntyre and colleagues (MacIntyre 2007; MacIntyre et al. 1998) highlight the significance of tipping points where, once preparedness to communicate reaches a particular threshold, language use is likely to be triggered.

As a behavioural intention and immediate precursor to actual language use, WTC is conceptualised to reflect the integrated effects of varying factors, including culture, personality traits, cognition and emotion (MacIntyre et al. 1998). A comprehensive overview of factors that influence and are influenced by WTC has recently been provided by Yashima (2019), while Zhang, Beckmann, and Beckmann (2018) have offered a systematic review of situational antecedents found to contribute to variation. In a meta-analysis comprising 64 studies published between 2000 and 2014, Elahi Shirvan et al. (2019) identify motivation, communication anxiety, and L2 competence as high-evidence correlates of WTC.

As these reviews indicate, the bulk of research so far conducted has focused on the investigation of *trait-level* influences. At the trait level, WTC is associated with several long-term consequences. Whereas higher WTC is associated with higher motivation to learn the L2 (Elahi Shirvan et al. 2019), frequent language use (Pawlak and Mystkowska-Wiertelak 2015) and increased in-class interactions (Yashima, MacIntyre, and Ikeda 2018), lower WTC has been found to be associated with communication anxiety, reduced self-confidence and feelings of cultural alienation (MacIntyre and Ayres-Glassey 2020). In a body of work that continues to grow, studies employing mostly cross-sectional designs have focused on between-variable relationships and influences (e.g. Clément, Baker, and MacIntyre 2003; Denies, Yashima, and Janssen 2015; MacIntyre and Charos 1996; MacIntyre, Ross, and Sparling 2019; Peng and Woodrow 2010; Yashima 2002; Yashima, Zenuk-Nishide, and Shimizu 2004).

Dynamical perspectives and state-level research

As part of the trend in SLA toward the application of dynamical perspectives (Larsen-Freeman and Cameron 2008) and the use of complexity-informed designs (Ortega and Han 2017), fluctuations in

WTC at the state level are also being explored. Responding to the call for more studies on situated WTC (MacIntyre 2007), MacIntyre, Burns, and Jessome (2011) showed how shifts from willingness to unwillingness could rapidly take place, triggered by subtle differences in the communication context. Similar results were found by MacIntyre and Legatto (2011), this time in a laboratory study, that showed how WTC can fluctuate over periods of time as short as a few minutes. Ground-breaking in revealing the existence of micro-level situational changes in WTC, MacIntyre and Legatto's (2011) research laid the foundation for a series of studies investigating WTC in classroom contexts. Some studies have examined dynamics across timescales of a single class meeting (see e.g. Pawlak and Mystkowska-Wiertelak 2015; Pawlak and Mystkowska-Wiertelak 2015; Yashima, MacIntyre, and Ikeda 2018). Others (e.g. Bernales 2016) have extended the time window by studying change over several weeks. While these studies contribute to understanding how WTC fluctuates in and between particular learning activities, and as a consequence of interactions between the learner and classroom situational influences, WTC dynamics have not been investigated at the *developmental timescale*, that is, the timescale at which development generally takes place (i.e. over periods of months) or during a developmental period when significant changes in communication behaviours are expected to occur.

WTC in 'high-use' multilingual contexts

Alongside the lack of developmentally focused research, it is striking how infrequently L2 communication behaviour has been studied beyond institutional contexts. Indeed, there do not appear to be any dedicated WTC studies in community settings (Yashima 2019). This is an important omission. Findings from classroom and lab contexts cannot be simply assumed to extrapolate to communication behaviour in community contexts. The most relevant antecedent factors may differ substantially between institutional and community settings (Baker and MacIntyre 2000). Specifically, patterns of intergroup contact (Clément, Baker, and MacIntyre 2003) and feedback from language users (Marton and MacIntyre 2020) are likely to have a more substantial impact on WTC and language use in 'high-use' contexts (Ortega 2009). For these reasons, it is important that WTC research takes place in contexts of L2 acquisition that stretch beyond the language classroom.

Investigating WTC in multilingual settings – where language use is situationally determined, and where several viable language options can co-exist – may be especially informative. To understand the dynamics of language use in everyday lives, Grosjean (2001, 2008, 2010) developed a model of language mode. Grosjean's argument is that, at any one time, a bilingual person can find themselves at a given point along a situational continuum where a particular *mode* of language use is induced. Towards one end of the continuum – when the person is engaged in interaction with another L1-speaker – they can be close to *monolingual mode*. However, when interacting with people who do not speak the L1, or who have lower levels of L1 competence, they can find themselves towards the other end of the continuum, in *bilingual mode*. When in bilingual mode, a person makes a decision about which language to use in the conversation. In Grosjean's model, the language decided on is the 'base language'. As Grosjean makes clear, in bilingual or multilingual situations, decision-making is highly complex:

> This process is called 'language choice' and is governed by a number of factors: the interlocutors involved, the situation of the interaction, the content of the discourse and the function of the interaction. Language choice is a well-learned behaviour, but it is also a very complex phenomenon that only becomes apparent when it breaks down. Usually, bilinguals go through their daily interactions with other bilinguals quite unaware of the many psychological and sociolinguistic factors that interact to help choose one language over another. (Grosjean 2015, 580)

Over time, domain-specific patterns of decision-making develop, and language choice becomes largely automatic. However, during certain developmental periods – such as, for example, when a language learner's TL-skills first begin to become functionally useful – *language choice* will be consciously negotiated in each situation that arises.

Willingness to communicate may lie at the heart of these processes. From a language mode perspective, WTC is not simply an intention to speak or to remain silent. Rather, WTC is part of the assembly of the situation, and involves assessment of the 'fit' of a particular language in a particular interactional context. In migration situations where interlocutors do not have a common L1, and where a contact language can facilitate communication, language choice can involve the making of decisions about whether to communicate in the host-country language, or in the contact language. The processes underlying WTC experienced by the speaker take account of the possible languages in the person's repertoire, reflecting their push and pull, and the implications attached to choosing to use them (including the possibility of code-switching or using nonverbal channels). The emergent WTC reflects a fluctuating state of communicative readiness which shifts with the flexibility of language choice in the situation, and with specific interlocutors. In a feedback process that changes WTC over time, experiences of the process of negotiating language choice and its consequences are likely to be crucial in determining which language is used to initiate, and to continue an interaction.

Exploring WTC dynamics in high-use contexts: process-oriented, intra-individual designs

Although the importance of investigating people's communication behaviour as it develops over time has long been recognised (MacIntyre 2007; Rubin 1990), the lack of longitudinal research has been detrimental to theory-building. In this respect, prospective panel studies can offer some insight into the communication behaviour trajectories of participant groups, and associations between variables (Hodis and Hodis 2013). However, while panel-based research can give a picture of developmental *trends*, it sheds little light on developmental *processes* (Serafini 2017). In process-oriented research, evidence of change is provided from data where numerous observations are made of an (often) small number of individuals over a (usually) extended period of time (Lowie 2017; Lowie and Verspoor 2019; Serafini 2017; van Geert 2020). As Lowie (2017) makes clear, 'the most powerful data to investigate a developmental process can be expected from longitudinal case studies and especially from case studies with dense measurements' (130).

There is an additional important reason to engage in intra-individual research in the study of communication behaviours. For research that explores differences in group means at varying points in time, developmental patterns can be generalised to a population of similar learners. However, there may not be a single learner within the group whose behaviour typifies the average developmental pattern. This is because patterns of variation observed at the group level are rarely applicable at the intra-individual level (Molenaar and Campbell 2009). As Lowie (2017) explains, 'there is no guarantee that the average grand sweep is representative for any of the individuals in the population. For this reason, group studies of development over time have limited potential' (137).

Study and purpose

In high-use environments where communication events can present the learner with the option of using either the TL or a contact language, WTC needs to be investigated in the dynamically shifting contexts of these choices. To generate an understanding of the development of WTC in multilingual community environments, and to capture the dynamics of non-linear developmental patterns, individual-level and process-oriented designs are needed. In individual-level research, there is not necessarily a prediction for the individual case. Rather, a focus on individuals generates awareness of the contingent nature of a communicative orientation, and of the changes that occur as the individual constantly adapts to shifting contextual and psychological situations (MacIntyre and Ayres-Glassey 2020; MacIntyre, Wang, and Khajavy 2020).

Responding to the demand in L2 psychology to 'carry out longitudinal case studies with multiple data points in order to reveal intra-individual complexity' (Serafini 2017, 369), and with the aim of generating insights into the developmental dynamics of WTC in a multilingual migration context,

the purpose of this study is to explore communication orientations for two L2s: a host-country target language (Swedish) and a contact language (English).

The study was carried out with a participant group of adult language learners of Swedish who had good communication skills in English, and at a time when they were on the cusp of developing functional communication skills in the TL. At the group-level, and over a longer timescale, it might be expected that the level of TL WTC would increase, and possibly exceed the level of contact language WTC. However, prospective panel research would mask the nonlinearity of individual developmental processes, which might be expected to vary considerably among the individual participants. Thus, in relation to processes of *intra-individual development* that take place *over time*, the following research questions were formulated:

RQ1: What developmental patterns are associated with contact language and target language WTC?

RQ2: Can statistically significant change points within individuals be identified where WTC in each language increases or decreases? If so, are change points closely spaced, or temporally separated?

RQ3: What happens to the participants' total and relative levels of WTC for each language?

Method

Design considerations

To study the dynamics of communication behaviours, and to shed light on the developmental patterns of focal constructs, investigations need to examine how processes unfold over time (MacIntyre et al. 2017). When carrying out process-oriented research, and where the aim is to uncover dynamical patterns of development, van Dijk, Verspoor, and Lowie (2011, 62) argue that the data collected should have three defining qualities. It should be *longitudinal*, it should be *dense* (collected regularly across multiple measurement points), and it should be *individual* (i.e. relating to specific participants, and not averaged out over a group).

In process-oriented research, data collection needs to be calibrated with the developmental change in focus (Lowie 2017). Because we were interested in investigating communication behaviour during a particular period of development – a time when functional skills in Swedish first emerge and when confidence to communicate in Swedish (rather than English) might begin to develop – data collection points were aligned with the *developmental timescale*, that is, the rate at which development in WTC might be expected to take place. In intensive learning contexts – such as the high-use context in focus here – it can be advisable to collect data repeatedly on anything between a daily and a monthly basis, depending on the timescale implied by the research question (s) (Lowie 2017; Serafini 2020). Recognising that changes might not often happen on a day-to-day basis, but that major shifts in development could take place from one month to the next, we decided to steer a middle path and collect data on a fortnightly basis. This strategy was motivated by three considerations: (i) the anticipated rate of WTC development, (ii) the suitability of the data in relation to the analytical procedures used in evaluating the meaningfulness of observed fluctuations and (iii) the degree to which it would be reasonable to expect participants to generate data using a standard instrument over many months (Lowie 2017).

Setting

The study took place in Sweden. In Sweden, community proficiency in English is generally high, and English provides an effective communication option in most situations of everyday life. For immigrants who arrive in Sweden with prior knowledge of English, social interaction can be greatly facilitated. English is a valued asset in daily transactions, in classroom meta-communication and in communication with representatives of state agencies (Henry 2016).

Participants

Seven participants took part in the study, three women and four men. Information is provided in Table 1.

Recruitment

The participants were recruited at the beginning of a fast-track programme for migrants with higher education and/or professional backgrounds.[1] The programme was offered by an educational provider in the west of Sweden. To be selected for the programme, students had to be beginning learners of Swedish (Common European Framework of Reference, A2-level). They also needed to be motivated to learn at a faster pace than normal.

For the current study, the inclusion criteria were that the participant: (i) had not been living in Sweden for more than 18 months, (ii) possessed functional communication skills in English at CEFR-B1 or above and (iii) was not a native speaker. To assess skills in English, students on the programme who expressed interest in the project were invited to take an assessment test. This test assessed basic comprehension skills at CEFR-B1 Independent User, Threshold level ('can understand the main points of clear standard input on familiar matters regularly encountered in work, school, leisure, etc'; 'can deal with most situations likely to arise while travelling in an area where the language is spoken') (see Supporting Information). Eight students were assessed as having these skills and were invited to participate in the research. Seven of these students further agreed to participate in an initial interview. In this interview (conducted in English, see Supporting Information), they were asked to provide information about their home background, their educational and professional careers, and their current situation. They were also asked about their communication practices. All participants described how, other than when interacting with other L1-speakers, they used English in social interaction.

Ethics

The research was conducted in accordance with the ethical guidelines of the Swedish Research Council. Participants were informed orally and in writing about (i) the purposes and procedures of the research, (ii) that participation was voluntary, (iii) that withdrawal was possible at any time, and without need for explanation and (iv) that confidentiality would be ensured.

Instrumentation

In longitudinal studies designed to detect dynamical patterns of development, data needs to be sufficiently extensive to capture processes in a representative way (Lowie 2017). To measure the participants' communication orientations, the Willingness to Communicate (WTC) scale (McCroskey 1992, 1997) was used. The WTC scale contains 20 items, 12 focal items (that combine communicating with friends, acquaintances and strangers in each of dyads, small groups, large groups, and in public), and 8 items that describe specific communication partners (see Scoring below). It is widely

Table 1. Study participants.

Participant number	Sex	Age	Time in Sweden	Region of origin	Migrant status
1.	F	25–35	8 months	N.E. Africa	Asylum-seeker
2.	F	35–45	14 months	S.E.	Asia spouse
3.	M	25–35	9 months	Middle East	Asylum-seeker
4.	M	45–55	12 months	Middle East	Asylum-seeker
5.	M	<25	7 months	Middle East	Asylum-seeker
6.	M	45–55	12 months	Middle East	asylum-seeker
7.	F	35–45	11 months	Middle East	asylum-seeker

used in human communication research and has a strong face and predictive validity. Alpha reliability estimates generally fall within the range of .85 to >.90 (McCroskey 1992).

In the current study, mirror-imaged scales were used. One measured English WTC (EWTC). The other measured Swedish WTC (SWTC). Items were identically worded (see Supporting Information).

WTC is operationalised as reflecting the 'individual's predisposition to initiate communication with others' (McCroskey 1997, 77), given that he or she 'has free choice to initiate or avoid communication' (McCroskey 1992, 20). Items, therefore, describe situations in which a person might choose to communicate, or not to communicate (example: 'when talking in a small group of acquaintances').

The response scales were identical to those in the original instrument. They required participants to indicate the percentage of times they would choose to communicate in each situation (0 = never, to 100 = always). The instructions (in English) were those prescribed in the original instrument. Participants were introduced to the instrument in a session run by the second author.

The formulation of certain items was modified to ensure relevance to the contemporary Swedish context. For item 1, the original formulation 'when talking with a service station attendant', was modified to read: 'when talking with a person in a convenience store'. For item 2, the original formulation 'talking with a physician' was modified to read: 'talking with a doctor, nurse or other medical person'. To reflect the types of situation that a participant might find themselves in, other minor modifications were made. For example, in item 3, the original formulation, 'presenting a talk to a group of strangers' was modified to: 'tell something to a group of strangers'. For item 13, the original formulation 'talking with a secretary' was modified to: 'talking with someone at the employment office'. The instrument is published as part of Supporting Information on the journal website.

Procedures for the data collection

The questionnaire was administered online, using a premium version of the 'Surveymonkey' package. At the beginning of the project, participants were given a tablet with an app through which the online questionnaire could easily be accessed. Participants were asked to complete the questionnaire at fortnightly intervals. A maximum time-limit was not set, and participants were told that they could continue completing the questionnaire as long as it felt meaningful to do so (up to a period of 12 months). The generation of data was closely monitored by the second author. When reporting was overdue, reminders were sent by email and text messaging. Six of the seven participants completed the questionnaire at the stipulated collection points. Participant 7 did not produce data beyond the initial collection rounds and was therefore excluded from the study.

Analytical procedures

Scoring

Total mean scores were calculated. According to the scoring guidelines provided by McCroskey, in a North American context, a score of >82 indicates high overall WTC, while a score of <52 indicates low overall WTC. However, McCroskey (1992) has noted that Sweden tends to be 5 points lower in total WTC than the USA. Thus, we used benchmarks of 77 and 48 to indicate high and low WTC respectively.

The original WTC instrument contains 8 un-scored filler items. These items reference WTC in contexts beyond formal learning, for example, 'talking with a waiter/waitress in a restaurant', 'talking with a stranger while standing in line'. Because these items relate to communication choices in high-use situations, they are highly relevant to the current study. These scores were therefore included in the computed means. In some studies, scores are also computed for context- and relation-specific sub-categories. Here, because we were interested in developmental patterns across a person's life situations, it is the total mean scores for SWTC and EWTC that are calculated.

Second language development is an iterative process. In empirical studies it is therefore necessary to use techniques that can illuminate nonlinear processes. As Lowie (2017) explains, 'time series analyses of dense longitudinal data are logically limited to individual cases' (136). This means that 'hypotheses about dynamic relationships can be formulated and tested against empirical data' (Lowie 2017, 135). To capture the dynamics of WTC development, analyses of the data were carried out using change point analysis (Taylor 2000) and moving window analysis (Verspoor, De Bot, and Lowie 2011). While change point analysis can identify significant increases or decreases in WTC, moving window correlational analyses can describe changes in the strength and direction of the relationship between English and Swedish WTC.

Change point analysis

Change point analysis (CPA) is a method appropriate for studying dynamics in contexts of language development (MacIntyre et al. 2017). CPA enables the analysis of changes in time series data where parametric assumptions cannot be made. CPA has been used in various dynamically focused studies in SLA. These include group-level studies (e.g. Han and Hiver 2018), and individual-level studies (Hiver 2016; Nitta and Baba 2015). In a study investigating changes in individual time series data, Nitta and Baba (2015) explored the development of Japanese students' ideal L2 selves. In his study, Hiver (2016) successfully used the method to examine changes in early-career teachers' professional experiences.

CPA identifies points or 'thresholds' along a distribution of values on either side of which characteristics can vary. CPA generates cumulative sum (CUSUM) charts as a means by which significant changes can be identified with an established probability (e.g. $p < .05$). It uses bootstrapping to provide confidence levels and confidence intervals for changes that are detected (Taylor 2000). With a focus on change, CPA can be used in studies that adopt complex dynamics systems theory (CDST) approaches (MacIntyre et al. 2017). Because it is able to identify 'stable states *and* changes towards other stable states' (Steenbeek, Jansen, and van Geert 2012, 68, emphasis added), CPA is particularly valuable in understanding developmental processes in open systems. It enables engagement with developmental dynamics through the use of CDST concepts such as emergence, co-evolution and self-organization (Larsen-Freeman and Cameron 2008; van Geert 2011).

Moving window of correlation analysis

A moving window of correlation analysis is a technique used to describe the relationship between two variables – or more specifically how that relationship may change over time – the aim being 'to make the interaction between the variables more visible' (Verspoor, De Bot, and Lowie 2011, 95). This technique is a potentially powerful supplement to visual inspection where the relationship between two variables can change over time. To perform the analysis, the size of the moving window is established at an arbitrary length. While Verspoor, De Bot, and Lowie (2011) demonstrate the technique with a span of 5 pairs of values, larger-sized windows of 10, 25 or 50 pairs of values can be used (MacIntyre and Gregersen 2021). In Figure 1, a window size of 10 pairs is set. The first correlation is computed for lines 1–10, the second correlation for lines 35–44, the third correlation for lines 36–45. In this example the window 'moves' by dropping the first pair of data values and including a new 10th pair of data. The process continues until the last pair of data values (i.e. the values 50.00 and 53.33 in Figure 1) has been included. Examining how the values of the correlation produced as the window moves can indicate whether the relationship between the variables, English WTC and Swedish WTC, is stable, or how much the relationship changes over time.

Results

In a high-use multilingual setting, and in relation to processes of intra-individual development that take place over time, the purpose of the study is to shed light on the developmental patterns associated with contact language and target language WTC. The results are presented in three sections.

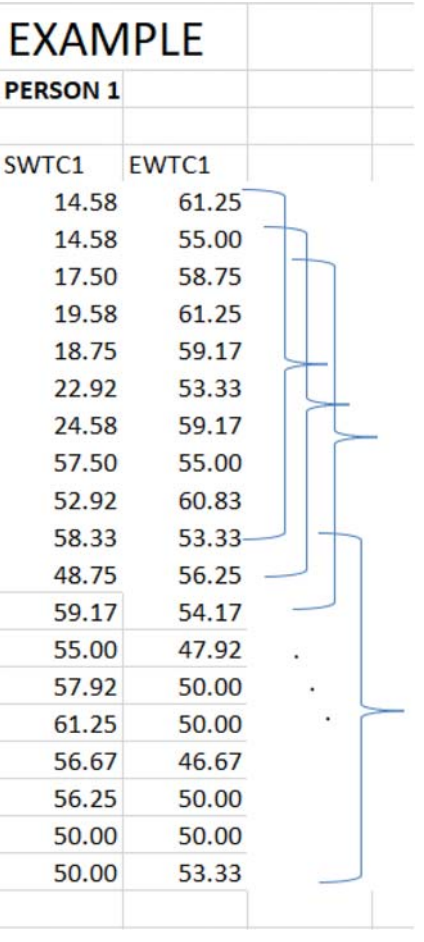

Figure 1. Example of moving window correlation analysis.

What developmental patterns are associated with contact language and target language WTC? (RQ1)

As illustrated in Figure 2, for all 6 participants, SWTC increased over the period during which scores were obtained. Over the same period, and as shown in Figure 2, EWTC decreased. Start and end values for SWTC and EWTC are presented in Table 2.

As illustrated in Table 3, the use of moving window correlation techniques revealed correlations between SWTC and EWTC. For three participants, correlations between EWTC and SWTC were of a magnitude of around -.4. This indicates that the development of SWTC is accompanied by some loss of EWTC (Figure 3).

Can statistically significant change points within individuals be identified where WTC in each language increases or decreases? If so, are change points closely spaced or temporally separated? (RQ2)

CPA techniques enable the detection of stable states, and points where changes from one period of dynamic stability to another take place (Steenbeek, Jansen, and van Geert 2012). In Figures 4–9, the SWTC and EWTC trajectories for individual participants are presented.

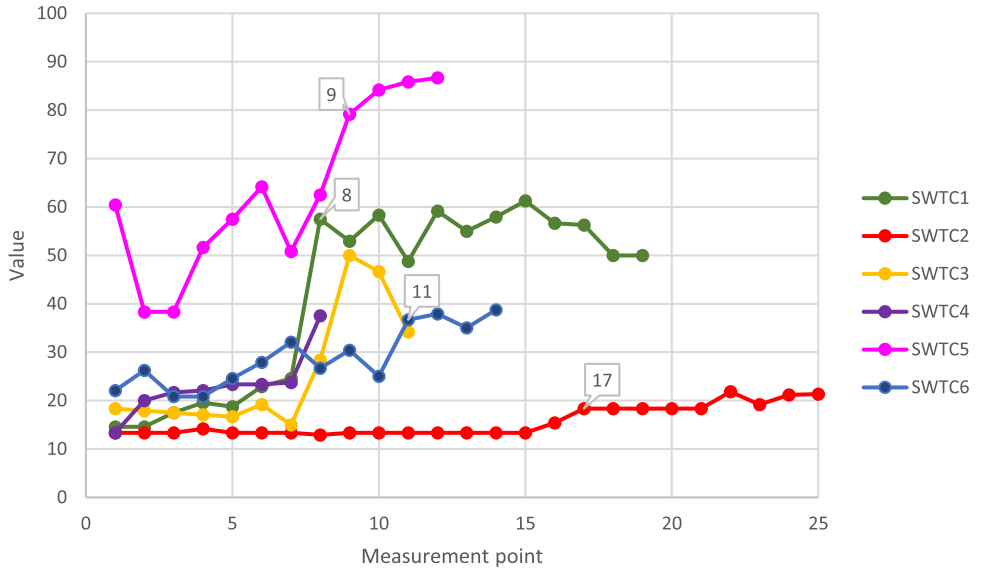

Figure 2. SWTC with change points indicated. This figure was produced from the CUSUM charts generated in the CPA analyses.

Change points indicating a significant shift from one state to another occur on a total of 8 occasions in the trajectories of four participants: P1 (Figure 4), P2 (Figure 5), P5 (Figure 8) and P6 (Figure 9). For each participant, shifts in both SWTC and EWTC trajectories occur. That is, in each case where a significant shift in mean scores was detected on the SWTC scale, a significant change was also found on the EWTC scale. In the case of P1, a significant (downwards) shift in EWTC scores occurred subsequent to a significant (upwards) shift in SWTC scores. For P2, significant downwards/upwards shifts appeared at roughly the same time. For P5 and P6, a significant downward shift for EWTC slightly preceded a significant upward shift for SWTC.

What happens to the participants' total and relative levels of WTC for each language? (RQ3)

While the trajectories show a similar pattern for all 6 participants – an increasing trend for SWTC scores and a decreasing trend for EWTC scores – it is apparent that there is wide variation between

Table 2. Start and end values.

	Start value	End value	SD	Degree of change
SWTC				
P1	14.58	50.00	18.44	35.42
P2	13.33	21.33	3.09	8.00
P3	18.33	34.17	12.66	15.84
P4	13.33	37.50	6.72	24.17
P5	60.42	86.67	17.38	26.25
P6	22.08	38.75	6.27	16.67
EWTC				
P1	61.25	53.33	4.63	−7.92
P2	66.67	65.00	3.42	−1.67
P3	83.33	60.00	13.22	−23.33
P4	37.08	24.17	3.80	−12.91
P5	63.75	14.17	19.26	−49.58
P6	87.92	66.25	6.12	−21.67

Table 3. Moving window correlations.

Range	*P1*	*P2*	*P3*[a]	*P5*	*P6*
1–10	−0.34	0.39	−0.4 (9)	−0.66	−0.39
2–11	−0.28	0.58	−0.38 (8)	−0.75	−0.44
3–12	−0.49	0.64		−0.72	−0.54
4–13	−0.51	0.89			−0.57
5–14	−0.45	0.11			−0.56
6–15	−0.38	0			−0.46
7–16	−0.55	0			
8–17	−0.44	0			
9–18	−0.33	−0.63			
10–19	−0.32	−0.73			
11–20		−0.59			
12–21		−0.63			
13–22		−0.69			
14–23		−0.68			
15–24		−0.67			
16–25		−0.58			
Mean *r*	−0.41	0.13	−0.39	−0.71	−0.49
Std. dev	0.087	0.540	0.01	0.037	0.067

Note: Range: the window of 10 pairs of EWTC and SWTC observations on which the corresponding correlation is calculated for each individual. P4 had only 8 pairs of scores in total and therefore, is not included.

[a]P3 is missing EWTC scores for the final two observations (10 and 11) so the moving window is based on 9 and 8 pairs of scores.

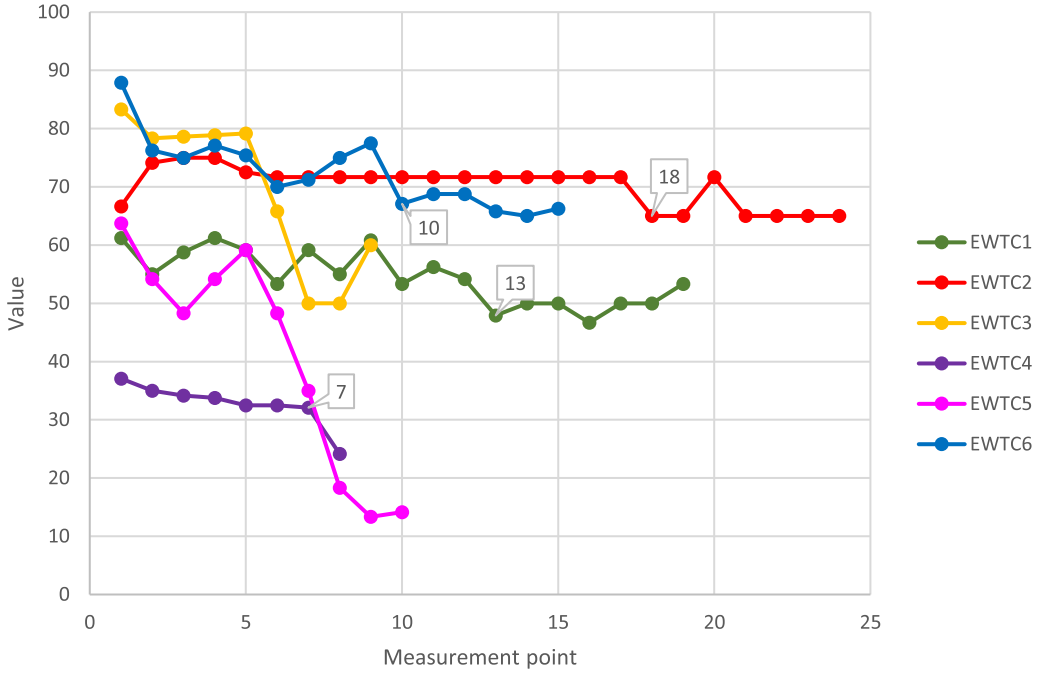

Figure 3. EWTC with change points indicated. This figure was produced from the CUSUM charts generated in the CPA analyses.

individuals in relative levels of WTC. For four participants (P1, P2, P3 and P6), EWTC scores remain greater, or marginally greater than SWTC scores at the end of the period. For the other two participants (P4 and P5), SWTC scores exceed EWTC scores.

There is similar individual-level variation regarding absolute levels of WTC. As previously indicated, in a Swedish setting scores of >77 indicate generally high overall WTC, while scores of <48

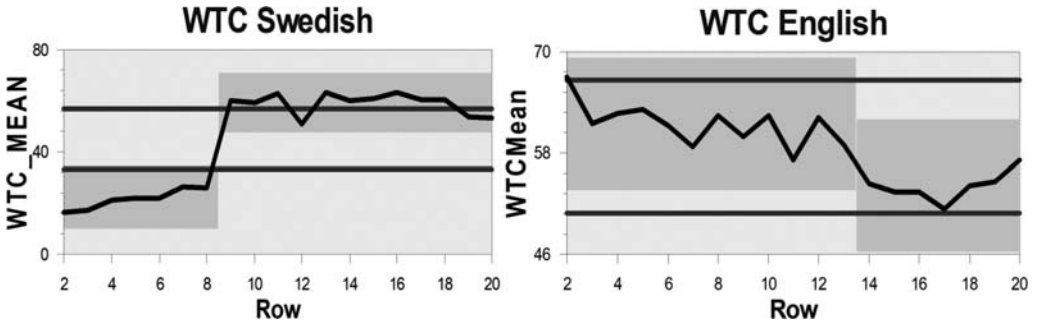

Figure 4. Participant 1, SWTC and EWTC.

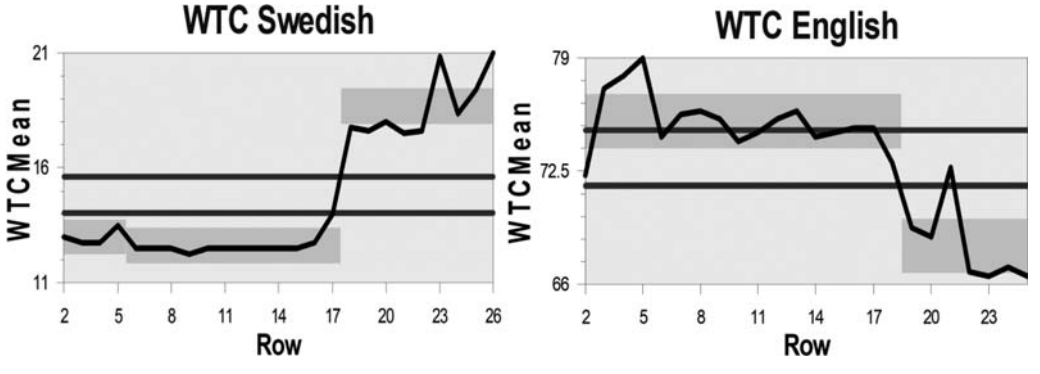

Figure 5. Participant 2, SWTC and EWTC.

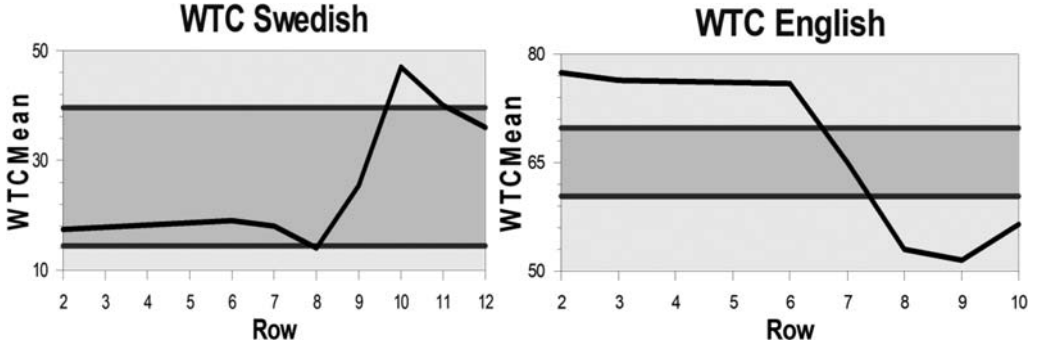

Figure 6. Participant 3, SWTC and EWTC.

indicate generally low overall WTC (McCroskey 1992). Excepting P6 (EWTC at the beginning of the period), and P5 (SWTC at the end), none of the participants has a score on either dimension that would indicate high overall WTC. For EWTC, scores show a pattern of shifting from generally moderate to generally weak. For SWTC, all participants, except P5, had low scores at the beginning of the period. While scores increase for all the participants, at the end of the period there are only two participants whose scores exceed the threshold for low WTC (P1 has a moderate score at the end of the period, and P5 a high final score).

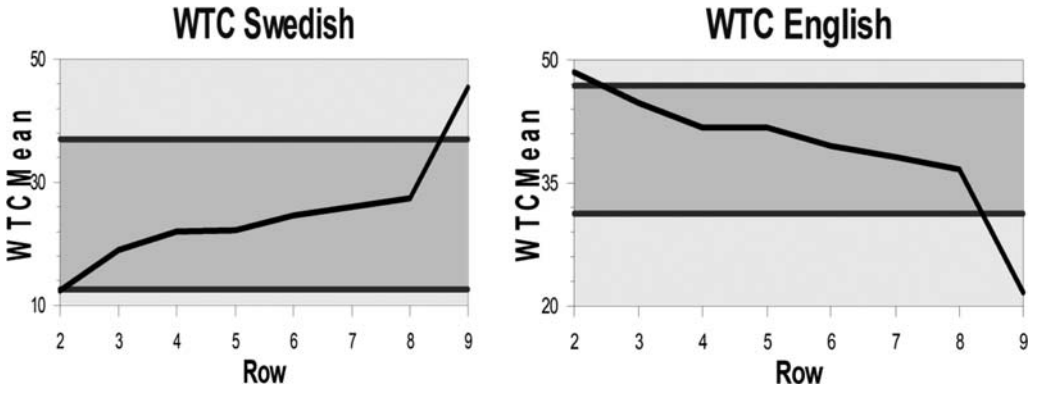

Figure 7. Participant 4, SWTC and EWTC.

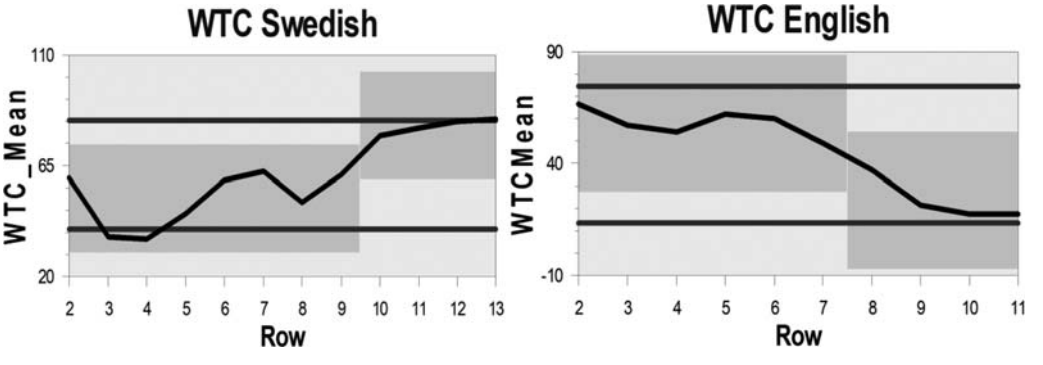

Figure 8. Participant 5, SWTC and EWTC.

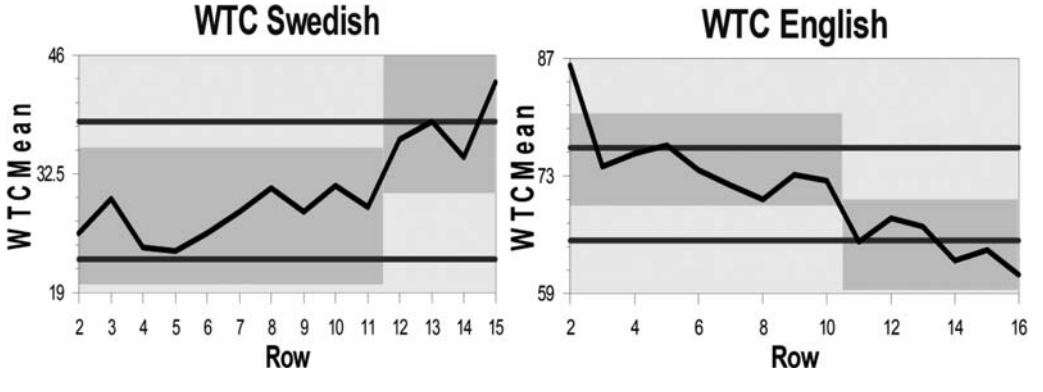

Figure 9. Participant 6, SWTC and EWTC.

Discussion

Language mode dynamics and processes of co-evolution

To interpret the findings, we return to Grosjean's (2001, 2008, 2015) concept of *language modes*. Because WTC is the immediate antecedent of actual language use (MacIntyre et al. 1998), the patterns of WTC illuminated in the data – increases in SWTC scores and related decreases in EWTC scores – provide a revealing example of language mode dynamics at a point in time when an

individual might first find themselves in bilingual mode. Across a timescale of months, the results point to shifts in language mode configurations. The frequency of using English as the base language for communication declines, while the frequency of using Swedish increases. Both modes are clearly available to the language user throughout the timeframe: WTC never approaches zero in either language. However, as reflected by their corresponding WTC ratings and revealed in the moving window correlational analyses, both the absolute and relative preferences for each language change significantly, with growth and loss occurring in a co-evolutionary pattern.

Intra-individual variation

Examining the developmental trajectories of the 6 participants, inter-individual variation is readily apparent. If we compare P1 and P2 (both females, and both generating data over the longest period), it can be seen how at the beginning of the period both participants have much higher English WTC compared to Swedish WTC. This indicates that English is likely to be the dominant language for communication. However, the single-case design shows how the developmental patterns for these two participants are very different. While the trend of increasing Swedish WTC and decreasing English WTC is similar for both, the intra-individual slope of the trajectories differs greatly. For P1, the trajectories indicate that, towards the end of the period, there are times when she may be more willing to communicate in Swedish than English (the final values being roughly equal). This would indicate that Swedish may be in the process of becoming the dominant language mode, even in communication situations where the interlocutor is an unfamiliar person. For P2 the situation differs, as the scores for English remain considerably higher throughout the period. However, the underlying developmental process of increasing Swedish WTC and decreasing English WTC is the same. While at the beginning of the period EWTC and SWTC are substantially and positively correlated (with little change in either) towards the end of the period – around the 17th observation – the correlation changes sign. This indicates that the process of WTC decision-making shifted around this time. In a manner similar to other participants, as SWTC slowly begins to climb, a corresponding and significant decrease in EWTC is observed (for further discussions of changes taking place for this participant at this time, see the companion paper, Henry, Thorsen, and MacIntyre in press). Similar patterns of inter-individual variation can be seen by comparing other participant pairs where data is generated over a roughly similar period. While for P4, Swedish seems to have emerged as the dominant language in communication situations, for P3 English remains dominant. For P5, Swedish similarly appears to have become the dominant language for communication initiation. However, for P6, the relatively higher scores for English WTC indicate that English probably remains dominant.

Stability and change

The findings indicate that WTC is characterised by patterns of stability and periods of change. For two participants (P1 and P5) WTC trajectories reveal how, following a period when English WTC shows a steep decline and the slope for Swedish WTC increases in a similar way, a new period of stability follows. For these participants, developmental patterns indicate that Swedish WTC is, or is in the process of becoming, greater than English WTC. While shifts of this sort can be highly influential in processes of language development, the lack of research on WTC in multilingual community contexts means that it is hard to know whether there are consistently identifiable thresholds or tipping points. In the present context, the interactions among the continuously variable psychological and social factors underlying language choice often meet up with a categorical choice; to initiate communication either in Swedish or in English (Henry, Thorsen, and MacIntyre in press). Yet the processes involved in making such a choice – unfolding below the surface – can produce substantial variation both within and between persons. Being able to identify change points – where there appears to be a discernible and statistically significant change in WTC based on an individual's

own prior data points – provides quantitative evidence of tipping points in trajectories of language change. Together, the change point and moving window correlation analyses reveal interrelated changes in propensities for choosing to communicate in English vs Swedish over time and differing patterns of dynamic stability and instability. In theory, adding a new language does not necessarily or automatically change WTC for existing languages; language development is not a zero-sum game. However, as the correlational analyses clearly indicate, for the present individuals a trade-off takes place between English and Swedish: as Swedish WTC develops, English WTC declines. When shifts in a person's WTC propensities mean that a TL may begin to become the default language in social interaction – the base language in Grosjean's model – the acquisition of language skills is also likely to enter a new developmental phase. When relative propensities to initiate and continue communication change, and when a host country language becomes generally more preferred, new opportunities for TL-practice and development arise.

WTC can operate across a multitude of timescales – from a single communication event to the development of stable and trait-like communication propensities. In the current study, the developmental timescale is a timescale of months. In contexts of migration, where learners find new interlocutors, new purposes for language use, and new linguistic needs, the importance and usefulness of languages in a person's repertoire will gradually shift (Grosjean 2010, 2015). Considered as a pattern of intra-individual development, multilingual language acquisition involves patterns of change. As Grosjean (2015, 579) explains, there will be 'periods of stability, of different durations, and then periods of language reorganization during which an existing language may be strengthened, another one may lose its importance, yet another may be acquired'. As a consequence of these fluctuations, changes can take place in the dominance of the languages in a bilingual's repertoire (Grosjean 2010, 2015). In Grosjean's bilingual model, the first language can lose its dominance. Although the situation for a multilingual person is likely to be more complex (Dewaele 2001), our results are illustrative of a process where a contact language can similarly lose its dominance.

Limitations

The study has limitations that should be noted when interpreting the findings. Carrying out research in migration contexts presents many challenges, not least when longitudinal designs are used, and when the researcher cannot assume that data generation will take place exactly as anticipated (Kanno 2017). In relation to the study's single-case design, two specific limitations need to be highlighted. First, because in a time-series analysis a large number of measurement occasions is needed, there are risks of participant burnout and biased attrition (Barbot and Perchec 2015; Steenbeek, Jansen, and van Geert 2012). Here, in addition to P7 (who did not complete the questionnaire beyond a few initial measurement points), two other participants (P4 and P3) completed 9 and 12 rounds of data collection respectively. For these participants, significant changes in WTC scores were not registered. Although measurement points of this number are generally suitable for CPA (see e.g. Han and Hiver 2018; Hiver 2016), it is possible that changes that had, in fact, taken place were not detected due to a lack of observations beyond the point when the participants stopped producing data. A similar limitation exists with the moving window of correlations where the size of the window (in the present study 10 observations reflecting approximately 20 weeks of development) can have an impact on the ability to identify meaningful patterns – a window that is very small tends to produce correlations that fluctuate more than larger windows with more data points. We must also keep in mind that the processes of language development for the individual participants in the study were taking place before the study began and presumably continued after the data collection was complete. The moving window is able to look upon a limited time period that opened and closed at different times for different participants.

The second limitation relates to the 'training effect', where any given measurement will reflect the immediately previous measurement (Barbot and Perchec 2015). Because of this effect, single-

case analyses 'may reflect partly the effect of the intensive measurement itself rather than just the developmental process of interest' (Barbot and Perchec 2015, 62). This design limitation can affect our results. Familiarity with the instrument could have led to the production of similar scores, in this way masking shifts in communication propensities that might have taken place.

Conclusion

As De Bot and Jaensch (2015, 11) make clear, in contexts of L3 acquisition 'it is pointless to study just one of the languages in the multilingual system', and research needs to 'be concerned with change over time rather than stasis'. Focused on a period in which host country language skills were beginning to be being acquired, in this study a time serial design was used to explore WTC dynamics and patterns of co-evolution at the *developmental timescale*. Across the six cases in focus, patterns of WTC development revealed differences and consistencies. As shown in our analyses, the starting point and slope of the line reflecting the increased propensity to initiate communication in Swedish is different for each participant. This seems likely to reflect a combination of individual and situational factors that uniquely affect each person in different ways. In addition to personality and emotional differences, participants have different family situations, different neighbours to talk to (each with their own WTC), different ambitions, and different approaches to learning. At the same time, there is an overall consistency in interrelated tendencies for Swedish WTC to increase and for English WTC to decline, with shifts in one WTC mode coordinated with shifts in the other. The results reveal how WTC is highly adaptive and can be understood in terms of changing probabilities. As experiences change, and as linguistic knowledge develops – not least the informal learning of vernacular patterns and idioms from experience *in situ* – there can be a tipping point where the 'learner' becomes a 'speaker', and where the probability of using the contact language will decline. Over time, a stable state may arise where a contact language can remain available for use, but is more generally deactivated (Dewaele 2001).

The research is novel in several respects. *First*, the data point to the operation of mutually interacting influences that shape WTC trajectories, and which have system-level effects. In a high-use multilingual setting, where language choice in interactions is nearly always possible, the use of a time-serial design reveals how changes in TL WTC become meaningful in relation to the underlying 'pull' of contact language WTC. Thus, contact language WTC can be understood as forming the context in which TL WTC develops. In ongoing processes of co-evolution between these two components in a person's WTC system, change in the propensity to use one language appears to be motivated by a change in propensity to use the other.

It is unlikely that these changes are attributable to any degree of meaningful loss of English among the participants. The timeframe is simply too short, and English continues to be used in communication (Henry, Thorsen, and MacIntyre in press). Rather, change in English WTC should be understood as *relative* to change in Swedish WTC – the change in the contact language WTC being a driver of change in target language WTC. This emphasises the theoretical position raised in the introduction to this paper, namely that WTC is an assembled and emergent psychological state of readiness to use a particular language.

Second, the study functions to bridge the trait–state divide. State and trait are but two of a number of possible timescales along which WTC (and other IDs) can be investigated. In examining WTC at the developmental timescale – a window of time that is wide enough to reveal changes that are trait-like, but which it is assumed will not be stable for these participants in the future – we show how WTC fluctuates week-by-week during a critical stage of language development.

Finally, the data demonstrate how, as the probability of TL use increases, a contact language that can initially function as an affordance for communication in a host community (Henry 2016) can gradually give way to the TL. This is a finding which has important implications. Given that opportunities for

TL use beyond educational settings are not easily accessed, willingness to seek out and to take advantage of opportunities to communicate in the TL are crucial for language development. Significantly, the language skills most likely to develop through social interaction – and which are most at risk when an individual remains silent or choses to communicate in a contact language – are those that can have greatest importance. As Derwing and Munro (2013) have demonstrated (see also Derwing et al. 2014), it is the 'soft skills' of comprehensibility, fluency, and accent gained in informal social interaction that are crucial in determining how well, and how quickly migrants establish themselves in society. Indeed, Derwing and Munro (2013) make clear that the language skills gained solely from educational programmes are generally 'insufficient to ensure full integration' (180). As the current study suggests, when a contact language remains the most viable alternative for communication during TL-learning, the development of TL skills may be crucially at risk.

Note

1. Students enrolled on the programme could also study basic and intermediate-level Swedish for Immigrants (SFI) courses at municipally operated centres.

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