Examining the Dynamic Relationships Between Willingness to Communicate, Anxiety and Enjoyment Using the Experience Sampling Method

Gholam Hassan Khajavy, Peter D. MacIntyre, Tahereh Taherian, and Jessica Ross

Abstract The aim of the present study was to examine the dynamic relationship between willingness to communicate, foreign language anxiety, and foreign language enjoyment using experience sampling method. To this end, a total number of 38 freshman Iranian university students who were studying Teaching English as a Foreign Language (TEFL) as an academic major participated in the study. Results of the study showed significant amount of variability in all three variables over time, both within weekly sessions and from one week to another. Moreover, moving correlations among the three variables showed the correlations between WTC and enjoyment were remarkably consistent, strong, and positive, while moving correlations between WTC and anxiety, and anxiety and enjoyment were inconsistent and majority of them were negative. Finally, research and pedagogical implications were discussed in light of the findings of the study.

Keywords Willingness to communicate · Anxiety · Enjoyment · Experience sampling method · Moving correlations

G. H. Khajavy (✉)
Department of Foreign Languages, University of Bojnord, Bojnord, Iran
e-mail: hkhajavy@ub.ac.ir; hkhajavy@gmail.com

P. D. MacIntyre
Department of Psychology, Cape Breton University, 1250 Grand Lake Road, Sydney, NS, Canada
e-mail: Peter_MacIntyre@cbu.ca

T. Taherian
English Language Department, Yazd University, Yazd, Iran
e-mail: taherian87@yahoo.com

J. Ross
Department of Psychology, University of Waterloo, Waterloo, Canada
e-mail: jrross@uwaterloo.ca

1 Introduction

Willingness to communicate (WTC) refers to being ready to talk which can be either a general personality trait toward talking (McCroskey & Richmond, 1991) or in a more contextualized sense—speaking with a specific individual in a specific context (MacIntyre et al., 1998). Examining the factors which contribute to willingness to speak in L2 has been the focus of many research papers (Cao, 2011, 2014; Ghonsooly et al., 2012; Joe et al., 2017; Khajavy et al., 2016; Peng & Woodrow, 2010). These studies mostly have treated WTC as a personality variable, a stable tendency to initiate communication, and have used questionnaires to assess both WTC and factors that contribute to it. However, recently the dynamic and contextual nature of WTC has started being discussed in the literature (MacIntyre & Legatto, 2011; Pawlak et al., 2016; Yashima et al., 2016). The dynamic aspect of WTC highlights that it can change moment-to-moment with an individual, while also recognizing stability over time and differences from one individual to another.

Emotions can also change rapidly from moment-to-moment and we believe the continuous interaction of emotions with communication is important for understanding WTC. In the classroom, learners quickly react to changes in emotions as spikes in anxiety occur (Gregersen et al., 2014) or moments of enjoyment take place; changes in emotions can affect WTC levels (Khajavy et al., 2018). Previous research by Khajavy et al. (2018) has reported evidence that anxiety and enjoyment are related to WTC. The present study aims to further explore the connections between WTC and emotions using a combination of quantitative data and explanations offered by the learners themselves. Data analysis will link the factors emerging from the present research to WTC theory and prior research. This study uses a variation of the sampling method, which repeatedly measures students' WTC, enjoyment, and anxiety at fixed time points during a classroom lesson. This technique has the advantage of mitigating biases related to retrospective memory, a major source of concern for interpreting the veracity of qualitative data, by testing variables in real time. Moreover, factors underlying WTC, anxiety, and enjoyment for individual learners can be investigated. This shows us what contextual and linguistic factors are responsible for students' WTC, anxiety, and enjoyment.

2 Review of Literature

2.1 Willingness to Communicate

Originally, empirical exploration of WTC started with the first language (L1) and relied on Burgoon's (1976) explanation of unwillingness to communicate as a stable concept. Later, framed more positively, WTC was initially conceptualized as a tendency to start or avoid conversation with others when there is a choice (McCroskey, 1992). WTC was perceived as an individual difference variable, reflecting the

easily observed tendency for some people to initiate conversation more than others. McCroskey and Richmond (1991) recognized that WTC is not constant from situation to situation—talking to strangers is different from talking to friends to acquaintances—but stable patterns can be observed. A number of studies established the relevance of WTC to communication processes such as perceived competence, communication apprehension, personality, and social factors (McCroskey, 1992; MacIntyre et al., 1999; Hodis et al., 2010).

Along with studies of L1, attention also has been focused on the investigation of second language (L2) WTC (e.g., MacIntyre & Charos, 1996; MacIntyre & Clément, 1996). In 1998, MacIntyre et al. argued that L2 WTC is a complex variable that cannot be described as "a simple manifestation of WTC in the L1" (p. 546). They defined it as the "readiness to enter into discourse at a particular time with a specific person or persons, using a L2" (1998, p. 547). Viewed in this way, L2 WTC is the outcome of an interaction of numerous elements, both long-term and immediate, including the broad social context and individual factors, affective and cognitive factors, motivational inclinations, situational experiences, and behavioral intentions. The model was considered in the form of a pyramid including six layers, beginning with intergroup climate and personality at the bottom and L2 use at the top.

More recently, researchers have focused attention on the fluctuations in WTC during specific task activities (e.g., Pawlak et al., 2016). A significant advance in methodology used to explore L2 WTC is based on MacIntyre & Legatto (2011) who used the idiodynamic approach and employed it to investigate changes in the student's affective states. In this method, individuals watch video recordings of communicative tasks in which they participate and they rate their WTC continuously over time, using a computer mouse and specially designed software. Qualitative data are provided in an interview that reviews the recording and engages in discussion of the fluctuation in ratings provided by the students. The researchers then triangulate the explanations for changes provided by the speakers with ratings made of the video, to connect internal mental events with observable communication behavior. Often, a great deal of fluctuation in WTC is observed during the task duration and information that can be provided only from the speaker herself or himself clarifies their rationale for changes in WTC. This line of analysis is an example of research into dynamic systems theory (e.g., Larsen-Freeman & Cameron, 2008). A dynamic systems approach demands studying WTC as a complex system that fluctuates over time due to an interaction of various factors. This approach introduces new types of research questions that seek to explain variability in the relationships among variables—instead of asking 'what is the correlation of anxiety and WTC', a dynamic approach might find positive and negative correlation that take place over different periods of time (MacIntyre et al., 2017).

Following MacIntyre and Legatto's (2011) initial study on the dynamic nature of WTC, recent empirical research has investigated the dynamicity of WTC in authentic communication contexts associated with the language learning (Bernales, 2016; Cao, 2014; D'Amico, 2012; Elahi & Taherian, 2016; MacIntyre, 2012a; Mystkowska-Wiertelak & Pawlak, 2014; Peng, 2014; Wood, 2016; Yue, 2014).

MacIntyre et al. (2011) investigated the ebbs and flows of learners' WTC. The researchers found situation that engender high WTC and those that produce unWTC often are remarkably similar. Even small alterations in the situation, such as the presence or absence of a smile from the teacher, may dramatically affect the level of the WTC. Moreover, Wood (2016) investigated the dynamic experience of the language students and provided evidence that connects WTC and speech fluency of Japanese students learning English as a foreign language. Wood also observed that a minor change in one of the antecedent variables can have a noticeable impact on the other.

Peng et al. (2017) investigated the dynamics of WTC in an English as a foreign language classroom in two groups of students, one willing and the other unwilling to communicate. They attempted to elicit participants' perceptions about how multi-dimensional factors, including gesture or gaze, affect WTC. The data included two classroom scenarios using videotaped English lessons, stimulated recall interviews, and learning journals. They reported that the initial level of WTC was high in most cases; however, due to changes in contextual and affective factors, maintaining high level of WTC was difficult. Moreover, analyzing and comparing the discourse semantic features of the two scenarios indicated that, for experiential meanings, the occurrence of mental processes, which shows the act of thinking from the teacher, was greater in the high WTC situation than in the low WTC situation.

Yashima et al. (2016) also investigated WTC in an authentic classroom situation, taking both a trait- and state-like perspective and a mixed method approach. In the qualitative phase of study, they gathered data by means of classroom observation, self-reflection, and interviews. In the quantitative phase of study they collected data via self-reported WTC and trait anxiety surveys. The researchers described specific ways in which the interaction of both fixed characteristics (such as personality and L2 proficiency) and contextual factors (e.g., interlocutor response and classroom interactional patterns) create fluctuations in WTC.

2.2 Emotions

It is uncontroversial that emotions play an important role in the process of SLA. However, it seems that they have been ignored in the SLA research (Dörnyei & Ryan, 2015). Existing emotion research has tended to concentrate on negative emotions, with a focus on anxiety (Dewaele & MacIntyre, 2014).

The first studies regarding anxiety in SLA produced inconsistent results (Kleinmann, 1977). Horwitz et al. (1986) asserted that the research inconsistencies might due to language anxiety being a multi-dimensional construct that is specific to the context of second language acquisition. Horwitz (2017) argued that not all types and varieties of anxiety might be related to language learning. MacIntyre (2017) labelled the period before the mid-1980s as the 'confounded phase' of research because anxiety constructs were borrowed from other domains and applied to language learning without a thorough analysis of their applicability.

Horwitz et al. (1986) defined FLCA as "a distinct complex of self-perceptions, beliefs, feelings and behaviors related to classroom learning arising from the uniqueness of the language learning process" (Horwitz et al., 1986, p. 128). To measure the FLCA construct, they introduced a specific tool called foreign language classroom anxiety scale (FLCAS). Research indicated that FLCA had a debilitating impact on the process of SLA. The results have been replicated in countries around the world, with various kinds of language students. More recently, Horwitz (2017) has emphasized FLCA is distinct, multi-faceted construct, that may be related to but in essence is distinct from constructs such as communication apprehension, test anxiety, and fear of negative evaluation.

Although the FLCAS is a scale measuring the general tendency to experience FLCA, similar to McCroskey's WTC construct, recent studies have investigated anxiety from a dynamic point of view. A ground-breaking study on the dynamic nature of anxiety used the idiodynamic approach to investigate the changes in the students' affective states and their association with both physical (heart rate) and mental processes (Gregersen et al., 2014). The study showed links between anxiety and heart rate, behavioral approaches to speaking that are more/less likely to reinforce anxiety, and the ability of the FLCAS to predict who was likely to experience anxiety more often and more intensely. One other, noteworthy outcome of this study was that one individual (identified only as Low Anxiety Person 2, LAP2) had a significant and unexpected anxiety reaction during the study. Results suggest that both stability and unexpected variability in anxiety reactions can be accounted for using a dynamic research approach.

The literature on language anxiety has successfully expanded knowledge about the physical, cognitive, social and academic correlates, but little is known about other relevant emotions. In particular, positive emotions have not been widely studied directly in SLA (Arnold and Brown, 1999). MacIntyre and Gregersen (2012) suggest that impact of positive emotion is more than simply having pleasurable feelings; they improve students' capacity to pay attention things in classroom context and build up their capacity for language input. Drawing on Fredrickson's broaden-and-build theory, MacIntyre and Gregersen emphasize the positive-broadening power of emotions such as joy, pride, and interest in creating an environment that is associated with intrinsic motivation and efficient learning. Additionally, positive emotions improve learners' flexibility during tough conditions and to recover from setbacks. Perhaps most important, positive emotion motivates students to discover and play, two crucial activities that promote social cohesion. MacIntyre and Vincze (2017) report that the ratio of positive to negative emotions, the so-called positivity ratio, predicts a wide variety of variables directly related to language learning motivation.

Recently, a number of studies have focused on language enjoyment. Dewaele and MacIntyre (2014) designed a Foreign Language Enjoyment (FLE) scale including 21 items demonstrating positive emotions towards the learning experience, peers and teacher. Another study by Dewaele and MacIntyre (2016) found two relatively independent factors underlying the enjoyment items, social and private FLE. Gender differences at item-level were also examined by Dewaele et al. (2016). Data analyses indicated that the 1287 female students pointed out having remarkably more

enjoyable times in classroom, concurred more effectively that they absorb fascinating things, and were more satisfied of their FL achievement than the 449 males. In addition, greater enjoyment of the FL classroom context was associated with feeling more creative and the idea that learning language was "cool". In addition to feeling more enjoyment, female learners also reported feeling more anxiety and had lower self-confidence in utilizing the FL than the male respondents. The researchers suggest that, perhaps, heightened emotionality might lead to the better acquisition and use of the FL by engaging the strong connection between motivation and emotion.

Recently, Dewaele and Dewaele (2017) also investigated the relationship of FLA and FLE over time. Although a prior large-scale survey reported the correlation between FLE and FLA to be moderate ($r = -0.34$), Dewaele and Dewaele reported smaller correlations of $r = -0.19$, $r = -0.19$ and $r = -0.29$ in groups of adolescents aged 12–13, 14–15, and 16–18 years, respectively. The authors also reported that different psychological and contextual variables predicted FLE and FLA, and that those predictors changed over time.

According to the literature review although some studies have investigated language anxiety and enjoyment, no research explores the integrative role of positive and negative emotions in the students' WTC from a dynamic perspective. It is vital to investigate them simultaneously because—as Dewaele and MacIntyre (2016) stated—they are the metaphorical left and right feet of students on their way to learning the FL. MacIntyre and Vincze (2017) studied emotions related to language learning using questionnaires, but they emphasize that the interaction of emotions in situ requires novel methodologies:

> It is an open question whether the pattern of correlations observed on this timescale would also apply to the dynamics of emotions as they wax and wane during the time span of a specific situation, such as a conversation or classroom lesson. To address emotions as they are experienced moment-to-moment requires a different methodology than the one used in the present study, especially, if researchers are interested in describing the coordination of positive and negative emotional experiences during communication. The adaptive value of both positive and negative emotion is best considered a conjoint, intertwined process. (pp. 78–79)

2.3   Experience Sampling Method

When researchers are interested in understanding behavior as it happens naturally in the environment, experience sampling method (ESM) or ecological momentary assessment (EMA) would be an appropriate method (Larson & Csikszentmihaly, 2014). In this method, repeated measurements of data are collected in fixed or random time points over a specific period of time (Frenzel, 2014). Participants should report their current feelings, thoughts, and behavior several times during the day for several weeks or months. Zirkel et al. (2015) mentioned five advantages of ESM for educational researchers. First, using ESM gives researchers the opportunity to access contexts that is not possible to reach in other research methodologies. Second, data in ESM are obtained as they are happening in the context; therefore, it does not

have the shortcomings of retrospective methods such as memory errors and other biases. Third, ESM data provide the researchers with a comprehensive report of individuals' experiences which can supplement data gathered in intensive qualitative studies. Fourth, ESM offers the opportunity to examine intraindividual processes which makes it possible to investigate feelings and thoughts in very specific environments. Finally, because data are gathered repeatedly, this provides the researchers with statistical power which cannot be easily obtained in other quantitative methods.

ESM can be conducted in three ways including signal contingent (or random sampling), interval contingent (or fixed sampling), and event contingent (or event-focused sampling, Bolger & Laurenceau, 2013; Uy et al., 2010). Signal contingent (or random sampling) refers to the type of sampling in which participants should report their experiences by setting an alarm for them, usually using a mobile phone or a personal digital assistant, which signals in random time points. After hearing the signal, they should answer some items. In interval contingent (or fixed sampling), participants should respond to the signal at fixed time points, for example every five or thirty minutes, they should complete a survey. Finally, event contingent (or event-focused sampling) is used when participants are asked to describe their experiences after some specific events.

In the field of applied linguistics, to the best of our knowledge, there is only one study conducted by Pawlak et al. (2016) which uses ESM. In this study, researchers asked participants to report their WTC on a paper every five minutes upon hearing a beep. Therefore, they were using interval contingent (or fixed sampling) method to record students' WTC.

2.4 The Present Study

What remains uninvestigated is to what extent FLA and FLE are related to fluctuations in L2 WTC within a specific classroom context. The present study aims to address five specific research questions, using an experience sampling approach. An important difference between the approach used in the present research and most prior research is that we are not asking 'what is the correlation' between the variables, but we are focused on how much the correlations might change over time, and when those correlations might be positive, negative, or near zero. We phrase our research questions as follows:

RQ1   Do ratings of WTC, anxiety and enjoyment show significant fluctuations during the weekly classroom sessions?

RQ2   Do mean ratings of WTC, anxiety and enjoyment show significant changes from week to week, over the 6 weeks?

RQ3   What are the correlations between WTC and Anxiety (measured repeatedly during a classroom lesson) and how do they change over time?

RQ4   What are the correlations between WTC and Enjoyment and how do they change over time?

RQ5   What are the correlations between Enjoyment and Anxiety and how do they change over time?

3 Methodology

3.1 Participants

Participants were 38 freshman Iranian university students (11 males and 27 females) who were majoring in Teaching English as a Foreign Language program. The participants' age ranged from 18 to 22 years ($M = 19.18$, $SD = 0.90$). All the participants speak Persian as their mother tongue. In order to enter the university, they had passed university entrance exam. As the students have enrolled in the first semester of the university, they have to pass a course called "conversation" in which they talk about different topics using various activities and also participate in a variety of listening activities. Students were also asked to self-evaluate their speaking ability on a scale from 1 (very weak) to 6 (very strong), yielding a mean of 3.71 ($SD = 1.10$). They also self-rated their overall language proficiency, with 84.2% of the participants rating themselves as either intermediate or upper-intermediate.

3.2 Materials

At the beginning of the study, participants completed a set of three trait scales, all of which were measured on a 7 point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). In addition, students were tested on the same three variables, using an experience sampling approach, repeatedly (10 times) during each of six regular classroom sessions.

3.2.1 Trait Measures

WTC scale ($\alpha = 0.76$) included 10 items from Weaver (2005) which were translated and validated by Khajavy et al. (2016). The items assessed students' tendency to speak in English in the classroom (e.g., I am willing to give a short speech in English to the class about my hometown with notes).

Anxiety scale ($\alpha = 0.82$) included 10 items from Horwitz et al.'s (1986) FLCAS which were translated and validated by Khodadady and Khajavy (2013). The items measured to what extent students feel anxious in the English class (e.g., I start to panic when I have to speak without preparation in English class).

Enjoyment scale ($\alpha = 0.88$) was assessed using 20 items from Dewaele and MacIntyre (2014, e.g., I can laugh off embarrassing mistakes in the FL).

3.3 Experience Sampling Method

To assess moment-by-moment fluctuations in WTC, enjoyment, and anxiety, we used a sheet of paper with three thermometer-shaped figures. Using the 'empty' thermometers, students indicated their levels of WTC, enjoyment, and anxiety (from 1 to 10) every five minutes when they heard a beep. The measurement approach was based on the 'anxometers' used by MacIntyre and Gardner (1991). More details about the procedure are given in the following section.

3.4 Procedure

Data were gathered during the regular class hours for six class meetings. As the teacher worked with different topics and activities, students were asked to rate their WTC, enjoyment, and anxiety. This procedure continued for 50 min, producing 10 ratings per class meeting. The instructions were in Persian and were as follows "Upon hearing the beep, how much are you willing to speak in English/how much are you enjoying the activity/how much do you feel anxious to speak in English?". Finally, when students heard the beep and rated their WTC, enjoyment, and anxiety, the teacher wrote down the kind of activity students were doing at that time. This is a variation on the experience sampling method.

4 Results

The first research question examines whether WTC, anxiety or enjoyment changes as the classroom lessons unfold each week (effect of *time*). The second research question examines fluctuations in WTC, anxiety and enjoyment across the six weeks (effect of *week*). To address these questions, data from the 10 testing occasions each week were entered into a 6×10 doubly multivariate ANOVA[1] where the dependent variables were WTC, anxiety and enjoyment and the independent variables were week (6) and time (10). Results show a significant violation of the assumption of Sphericity (see Table 1) indicating that the covariance matrix changes significantly within week and/or from one week to another. The variability in correlations that would contribute to a significant Mauchley's test is explicitly considered in analyses for RQ3–RQ5 reported below. To help compensate for the significant Mauchley's test, a Greenhouse–Geisser adjustment was made to the degrees of freedom. Even with the adjustment, the main effects for week and time were significant for all three dependent variables, as was the interaction of week x time (see Table 1).

---

[1] A doubly multivariate ANOVA has more than one dependent variable measured on more than one occasion.

Table 1 Results of 6 × 10 doubly multivariate ANOVA

		Mauchley's W	Greenhouse–Geisser	F	df	p	Partial Eta-Squared
WTC	Week	0.133	0.524	6.605	2.6, 44.6	<0.001	0.28
	Time	<0.001	0.360	6.682	8.5, 143.6	<0.05	0.28
	Week × Time	<0.001	0.188	2.548	3.2, 55.1	<0.001	0.13
Anxiety	Week	0.117	0.511	6.542	3.2, 53.6	<0.001	0.28
	Time	<0.001	0.369	2.544	2.56, 43.5	0.077	0.13
	Week × Time	<0.001	0.284	2.924	8.7, 148	<0.01	0.15
Enjoy	Week	0.205	0.630	6.207	2.5, 43.4	<0.01	0.27
	Time	<0.001	0.193	10.999	3.3, 56.4	<0.001	0.39
	Week × Time	<0.001	0.168	2.763	7.6, 128.4	<0.01	0.14

These results suggest a significant amount of variability in all three variables over time, both within weekly sessions and from one week to another. That is, as might be expected, mean levels of WTC enjoyment and anxiety do not remain constant throughout the study. Given that our interest is not directed toward specific mean differences and we did not hypothesize pairwise contrasts to be performed, post hoc comparisons of the 60 means involved in the interactions will not be conducted (see Fig. 1 for graphs of the means per class session and Table 2 for summary statistics). Instead, we turn to analysis of the variability in the relationships among the three dependent variables, as expressed by moving correlations.

There are three research questions about correlations that will be addressed. The relationship between WTC and Anxiety, WTC and Enjoyment, and Anxiety and Enjoyment. Each relationship will be examined dynamically, using 'moving correlations' in a descriptive manner. These correlations are presented as evidence for variability in relationships over time. For the present analyses there are 10 data points available per classroom session. There are 10 data collection times each week and we have averaged the data over all of the participants to create a single score for each of WTC, anxiety and enjoyment at each testing time (i.e., 10 scores per class session for each variable). The moving correlations shown in the figures below are calculated using five pairs of data each. To clarify, in the example below (Table 3), the first of the moving correlations between WTC and Anxiety is calculated over
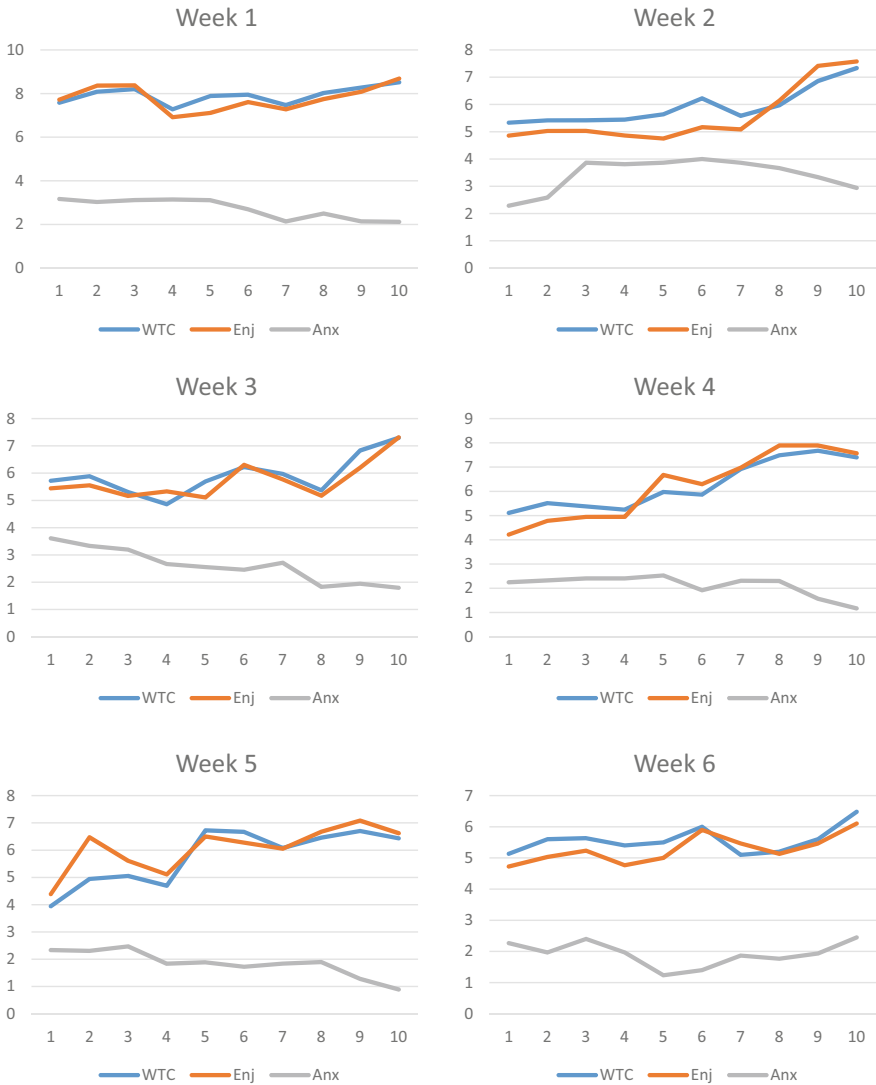
Fig. 1 Variability in mean levels of WTC, enjoyment and anxiety per week

the first five rows of data (A to E, shown in callout 1). The second correlation, also calculated using 5 rows, but after dropping down one row (using rows of data B to F, shown in callout 2). The next correlation drops down yet another row and is calculated for rows C to G. The fourth correlation uses rows D to H and the fifth and final correlation is calculated using rows E to I. These correlations are calculated within each of the six weeks of the study. In each case, the correlation reflects the strength of the relationship between the two variables, WTC and Anxiety in this example.

Table 2 Weekly means and SDs

		Week					
		1	2	3	4	5	6
WTC	Mean	7.7	6.0	5.9	6.7	6.0	5.5
	SD	0.36	0.65	0.69	0.96	0.96	0.40
Enjoyment	Mean	7.5	5.6	5.5	6.5	6.1	5.1
	SD	0.55	1.02	0.66	1.32	0.78	0.43
Anxiety	Mean	3.3	3.6	2.6	2.4	2.2	2.4
	SD	0.43	0.58	0.60	0.41	0.46	0.37

Table 3 Approach to calculating moving correlations

Note The callouts show the data used for the first, second and sixth moving correlations

Moving correlations are not tested for significance because we are not attempting to infer "the" correlation between variables in a population, but rather describe linear trends in the data over a limited period of time. Because the choice of 5 data points to include in the moving correlations is both minimal and arbitrary, for completeness the appendix will show correlations involving all possible ranges from $n = 5$ to $n = 10$ data points. In each case, the correlation is computed over the first n data points, the next correlation is computed over the same number of data points dropping down one row, and so on. The process continues until the final row of data is used. Our

focus in presorting the correlations is on the relative stability or variability in the correlation coefficients.

WTC and Enjoyment.

The moving correlations between WTC and anxiety are presented in the appendix. To help visualize the results, Fig. 2 presents the moving correlations with a span of 5. In week 1, correlations ranged from 0.77 to 0.96 with a correlation across all 10 data points of 0.85. In week 2, the only negative value in the set of correlations appears, with the range of correlations −0.58 to 0.89 and an overall correlation of 0.90.[2] In week three, the range of correlations was 0.33–0.94 with an overall correlation of 0.93; in week four the range was 0.89–0.94 with an overall correlation of 0.95, in week five the range was 0.61–0.97 with an overall correlation of 0.86, and finally in week 6 the range was 0.49–0.92 with an overall correlation of 0.77. Compared to the correlations involving WTC and Anxiety, the correlations between WTC and Enjoyment are remarkably consistent, strong, and positive. There is a single negative correlation in the set, 35 of 36 correlations are positive and at least moderate in strength. All of the overall correlations are positive and strong.

WTC and Anxiety.

The moving correlations between WTC and Anxiety are presented in the appendix and the correlations with a span of 5 are shown in Fig. 3. In week 1, correlations ranged from -0.62 to 0.29 with a correlation across all 10 data points in week 1 of −0.38. In week 2, virtually the entire range of possible correlations appears in the set, with the range of correlations −0.88 to 0.95 and an overall correlation near zero, r = −0.04. In week three, a narrower range of correlations was found, −0.46 to 0.48 with an overall correlation of −0.48. In week four the range was −0.38 to 0.81 with an overall correlation of −0.61, in week five the range was −0.57 to −0.04 with an overall correlation of −0.77, and finally in week 6 the range was −0.63 to 0.42 with an overall correlation of 0.17. The moving correlations involving WTC and Anxiety are remarkably inconsistent. The majority of correlations (26 of 36) are negative and four of the six overall correlations are negative and at least moderate in strength.

Anxiety and Enjoyment.

The correlations between enjoyment and anxiety are presented in the appendix and those with a span of 5 are shown in Fig. 4. For week 1, correlations ranged from −0.52 to 0.10 with a correlation across all 10 data points of −0.27. In week 2, virtually the entire range of theoretically possible correlations appears in the set, with the range of correlations −0.95 to 0.67 and an overall correlation of −0.18. In week three, a somewhat narrower range of correlations was found, −0.52 to 0.64 with an overall correlation of −0.50. In week four the range of correlations was −0.30 to 0.93 with an overall correlation of −0.53, in week five the range was −0.69 to 0.21 with an overall correlation of −0.56, and finally in week 6

---

[2]Note that this negative correlation disappears when the moving window is expanded to include 6 data points, and that adding one more row of data changes the correlation from −0.58 to 0.54.
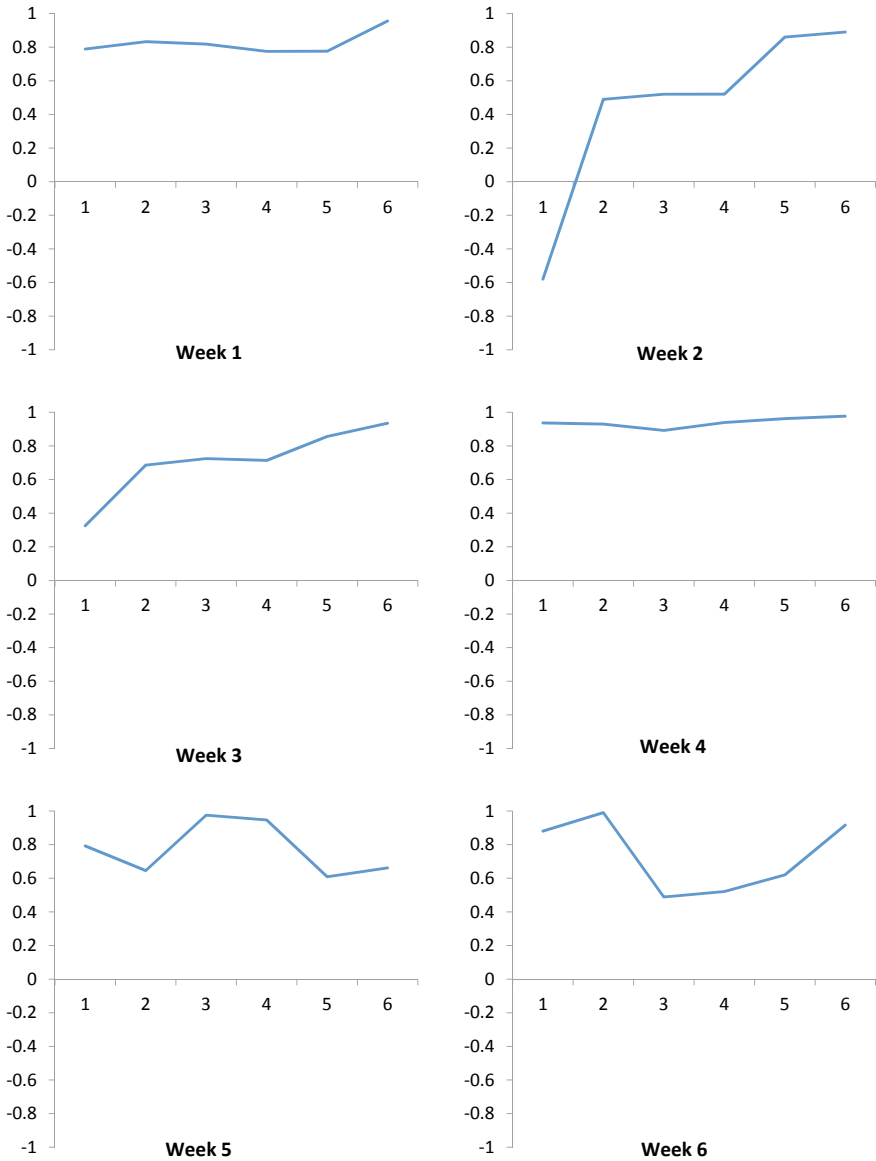
Fig. 2 Moving correlations: WTC and enjoyment

the range was −0.30 to 0.33 with an overall correlation near zero, 0.04. The moving correlations involving enjoyment and anxiety also are inconsistent, similar to those involving WTC and anxiety. The majority of correlations (26 of 36) are negative and five of the six overall correlations are negative with three that are considered strong.

Fig. 3 Moving correlations: WTC and anxiety

Fig. 4 Moving correlations: enjoyment and anxiety

5 Discussion

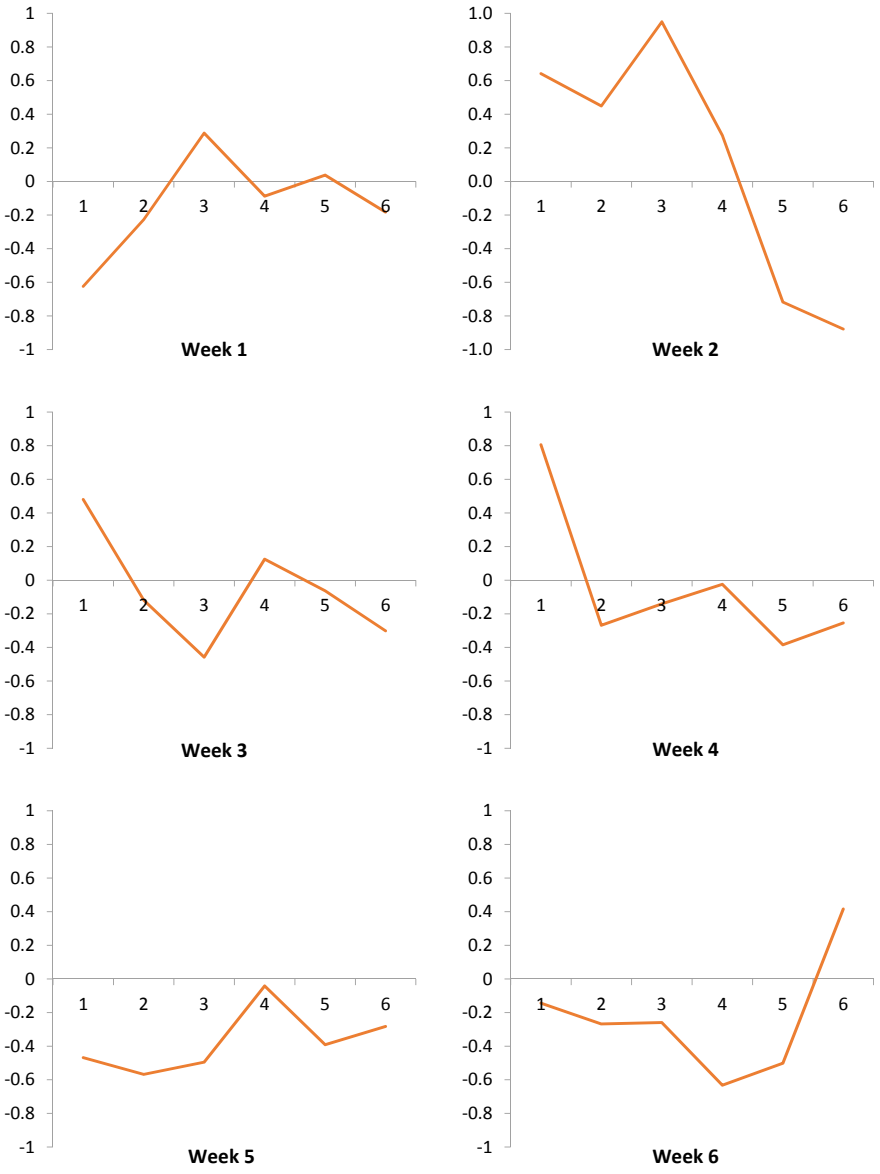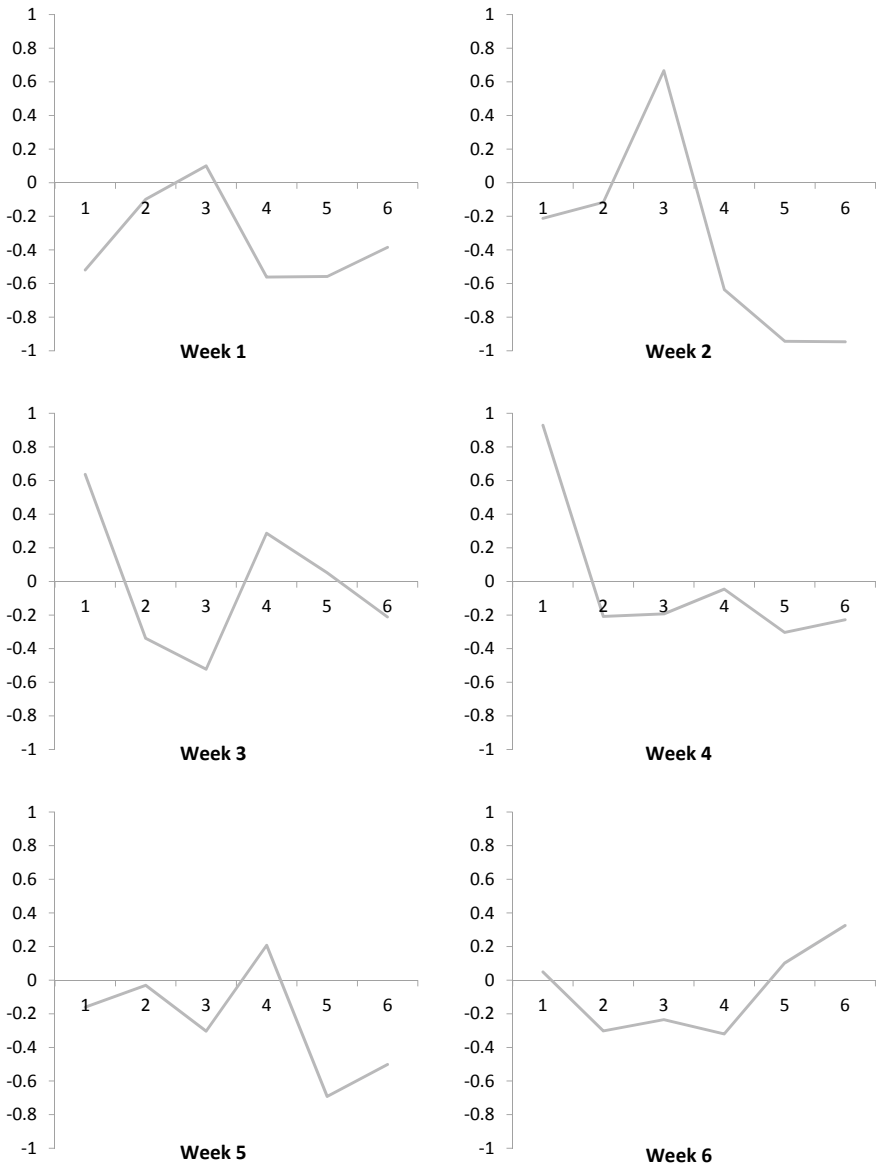The major focus of this study is on the variability in the moving correlations involving WTC. WTC and enjoyment show very consistent, strong and positive correlations. The correlations involving anxiety, however, are much more variable. The consistency of the relationship between WTC and enjoyment, as compared to the relationship between WTC and anxiety, can be seen in the pattern of mean ratings during each of the six classes shown in Fig. 1. As emotional reactions, enjoyment and anxiety appear to follow different patterns over a short period of time, creating different correlations with WTC. It also seems clear from the present results that changes in WTC ratings correspond to changes in enjoyment very closely, but fluctuations in WTC are not as consistently related to changes in anxiety in this context.

The original research on WTC that employed trait measures and focused on its stability across situations appears to be masking a great deal of underlying variability. Studies from a dynamic perspective have shown that ratings of WTC for individuals have the capacity to change dramatically over time (MacIntyre & Legatto, 2011; Yashima et al., 2016). Classroom studies also show that WTC fluctuates considerably during a classroom lesson (Pawlak et al., 2016; Mystkowska-Wiertelak & Pawlak, 2014). With the present data, we are able to see the influences of two emotions, enjoyment and anxiety, on the dynamics of WTC. Changes in WTC track closely changes in enjoyment, suggesting that over this time scale understanding the sources of enjoyment in the classroom is likely to contribute to a better understanding of WTC and vice versa.

Enjoyment is fundamentally a positive emotion. Fredrickson (2013, p. 4) describes joy as follows:

> Joy emerges when one's current circumstances present unexpected good fortune. People feel joy, for instance, when receiving good news or a pleasant surprise. Joy creates the urge to play and get involved, or what Frijda (1986) termed free activation, defined as an "aimless, unasked-for readiness to engage in whatever interaction presents itself" (p. 89). The durable resources created through play are the skills acquired through the experiential learning it prompts.

The notion that joy creates a 'readiness to engage' is consistent with the definition of WTC as a 'readiness' to communicate with specific persons. Furthermore, the suggestion that joy leads to the acquisition of resources from experiential learning is one of the goals of the communicative approach to language teaching and learning (Savignon, 1991). Given the results of the present study and the consistency with emotion theory, it is clear that the effects of positive emotion on WTC have been severely underestimated in the existing literature.

The results for anxiety are more complex and variable. Anxiety has been a strong and consistent correlate of WTC over many studies; indeed, McCroskey and Richmond (1991) proposed that it is the strongest predictor of WTC in L1. Results for communicating in L2 sometimes show that perceived competence is a stronger predictor of WTC, especially early in language learning (MacIntyre et al., 2003). Much of the literature describes anxiety as a potentially intense emotional reaction

(Horwitz et al., 1986), and it certainly can be a most unpleasant experience. However, the present data do not show high levels of anxiety in the particular classroom under study; rather low levels of anxiety are observed. As with WTC and enjoyment, the experience sampling data here show that anxiety fluctuates as events unfold in the classroom. But if we consider that anxiety was measured on a scale of 1–10, with 10 being highly anxious, then classroom levels of anxiety that fluctuate around a mean of 2 or 3 (as we have in the present data, see Table 2) are likely fairly manageable, both for most students as well as for the teacher. If the anxiety levels had been significantly higher, fluctuating around scores of 7 or 8 for example, then the emotional tenor of the classroom likely would be very different, dominated by angst, and much more unpleasant than what we observe in the present data. In no case do the anxiety ratings in the present data exceed enjoyment ratings, and only for a few ratings in week 2 do we see anxiety even within one point of enjoyment. Based on this pattern, it seems fair to characterize the class as being an 'enjoyable' one, though there seems to be a downward trend in enjoyment and WTC as weeks go by. In such a context, WTC appears to maintain strong correlations with enjoyment but inconsistent correlations with anxiety. Whether this pattern of correlations would be obtained in other settings or in a more tense classroom is an open question, and one that could be studied using the methods applied here. It seems plausibly to suggest that in a high-anxiety context, WTC ratings might track anxiety ratings more closely than we are reporting here, though that certainly is an open question.

Along with new theorizing for WTC, the present study offers implications of both language teaching and research methodology. Implications for classroom teachers reinforce the notion that teachers often have more control over creating enjoyment than they do over anxiety (Dewaele & MacIntyre, 2016). Dewaele and Dewaele (2017) argue, based on the results of their study, that "… teachers cannot eradicate FLCA because they are not the main source of it … the main source of anxiety is the judgment of the peers" (p. 19). Although the term 'facilitating anxiety' has fallen out of favor for being misunderstood and misused in the literature (Horwitz, 2017; MacIntyre, 2017), the notion of enjoyment is an appropriate replacement. Some of the most enjoyable and optimal experiences for learners feature a blend of excitement and apprehension, or what Csíkszentmihályi (2009) calls the 'flow channel.' Being in a state of flow combines engagement of one's skill in a challenging setting, where risks blend with rewards (Czimmerman & Piniel, 2016). If we apply the idea of the flow channel to WTC, being willing to engage with other people in the L2, while learning the language, is a skill-testing and potentially anxiety-provoking experience. Yet, when the conditions foster enjoyment of the learning process, anxiety may be manageable, and can recede into the background. Although anxiety might still be present, it might not be the most important factor determining the communicative patterns in the classroom. Teachers can remain cognizant that, as an emotional reaction to a specific event, anxiety can be an immediate, fairly intense emotional reaction that might flare up for a learner at any moment; even subtle changes in context can lead to anxiety and unwillingness to communicate (see MacIntyre et al., 2011). However, the development of positive emotion such as enjoyment can possibly 'undo' the negative effects of anxiety arousal, and equip

leaners with the resources to recover from sudden or unexpected anxiety arousal (Fredrickson, 2013; MacIntyre & Gregersen, 2012).

This study also has implications for classroom research methodology, both for data collection and analysis. We used a variation on the experience sampling method by collecting ratings at fixed intervals. This approach can produce the density of time-bound data recommended for studying dynamic systems (van Dijk et al., 2011). Furthermore, data collected in this way is less affected by biases in retrospective memory, as variables are assessed in the immediate context (Frenzel, 2014). Finally, the method used in the present study has an advantage over the idiodynamic method (MacIntyre, 2012b) because data is collected in a naturally-occurring setting. The idiodynamic method often demands greater experimental control to produce the video recordings and interviews that triangulate the data in a lab-based setting (though see Gregersen et al., 2014 for an exception). Therefore, researchers in the field of applied linguistics can use ESM in studies which examine participants' emotional states and in studies that recording immediate behavior in the context is necessary.

A final methodological point to consider is the span of the moving window over which the correlations are calculated. The width of the window has an impact on the value of the correlations. In general, the wider the window (longer the span) the more consistent the correlations are, which makes sense because longer spans are based on more data points. But a caution is in order for studying dynamics of communication, which can be a highly fluid process. The smallest moving window we used in the present study is 5 data points, representing 25 min of real time. A lot can happen in 25 min of classroom time. Therefore, the practical consideration of testing using dynamic methods must be carefully considered when interpreting the results. Templates used from other types of methods, such as significance testing from inferential statistics, might or might not be appropriate for a given data set. As an example of the issue in the present study, we see that across the moving windows within a week, the correlation between WTC and anxiety changed from positive to negative or negative to positive (for example from week 2 and week 6, respectively). As an emotional reaction, anxiety itself can change quickly. Even within this data set, we see that, considered over longer periods of time, correlations resemble those prior research has reported to a greater degree, though having only 5–10 pairs of scores in each correlation makes them prone to instability. The correlations involving all 10 rows of data are consistent with results typically reported in the literature. In this case, we are not trying to generalize beyond the data we have in hand, and we strongly encourage other researchers to collect data to assess of this kind. As the number of specific studies from a dynamic systems approach build in the literature, methodological refinements will occur. Prior research has been focused on generalization of patterns and finding consistency in relationships among constructs. Dynamic studies, however, can focus on variability and fluctuations in how variables correlate, reflecting the soft assembly of interacting systems that are open to change and adaptation (Larsen-Freeman, 2016).

Appendix

Week-by-week moving correlations with 5–10 data points.

Week 1:

WTC and Enjoyment

5	6	7	8	9	10
0.79	0.77	0.78	0.77	0.79	0.85
0.83	0.83	0.83	0.84	0.88	
0.82	0.83	0.86	0.91		
0.77	0.87	0.91			
0.78	0.88				
0.96					

Note For each of these tables, the columns represent the size of the moving window, that is, how many pairs of scores are involved in the correlation. A window of '5' indicates that 5 pairs of scores are involved in each correlation.

WTC and Anxiety

5	6	7	8	9	10
−0.62	−0.32	0.23	0.10	−0.18	−0.38
−0.23	0.33	0.21	−0.09	−0.31	
0.29	0.15	−0.15	−0.36		
−0.09	−0.38	−0.53			
0.04	−0.25				
−0.18					

Enjoyment and Anxiety

5	6	7	8	9	10
−0.52	−0.08	−0.08	0.16	−0.03	−0.27
−0.10	0.19	0.19	−0.04	−0.28	
0.10	0.01	0.01	−0.43		
−0.56	−0.71	−0.71			
−0.56	−0.63				
−0.38					

Week 2:

WTC and Enjoyment

5	6	7	8	9	10
−0.58	0.54	0.51	0.57	0.87	0.93
0.49	0.45	0.53	0.87	0.92	
0.52	0.53	0.87	0.92		
0.52	0.87	0.92			
0.86	0.91				
0.89					

WTC and Anxiety

5	6	7	8	9	10
0.64	0.55	0.54	0.53	0.23	−0.04
0.45	0.43	0.39	0.01	−0.33	
0.95	0.20	−0.69	−0.87		
0.27	−0.68	−0.87			
−0.72	−0.89				
−0.88					

Enjoyment and Anxiety

5	6	7	8	9	10
−0.21	0.13	0.21	0.17	0.00	−0.18
−0.12	−0.05	−0.01	−0.23	−0.45	
0.67	−0.64	−0.92	−0.93		
−0.64	−0.92	−0.92			

(continued)

5	6	7	8	9	10
−0.94	−0.93				
−0.95					

Week 3:

WTC and Enjoyment

5	6	7	8	9	10
0.33	0.68	0.70	0.72	0.81	0.90
0.69	0.71	0.73	0.81	0.90	
0.72	0.74	0.82	0.90		
0.71	0.80	0.89			
0.86	0.93				
0.94					

WTC and Anxiety

5	6	7	8	9	10
0.48	−0.02	−0.08	0.11	−0.26	−0.48
−0.12	−0.16	0.08	−0.30	−0.51	
−0.46	−0.10	−0.42	−0.60		
0.12	−0.31	−0.55			
−0.06	−0.41				
−0.30					

Enjoyment and Anxiety

5	6	7	8	9	10
0.64	−0.28	−0.32	−0.01	−0.26	−0.50
−0.34	−0.36	0.02	−0.25	−0.51	
−0.52	−0.03	−0.29	−0.54		
0.29	−0.07	−0.45			
0.05	−0.38				
−0.21	−0.28				

Week 4:

WTC and Enjoyment

5	6	7	8	9	10
0.94	0.95	0.90	0.94	0.95	0.95
0.93	0.87	0.93	0.94	0.95	
0.89	0.94	0.95	0.96		
0.94	0.95	0.95			
0.96	0.96				
0.98					

WTC and Anxiety

5	6	7	8	9	10
0.81	−0.13	−0.07	−0.06	−0.51	−0.61
−0.27	−0.14	−0.12	−0.55	−0.62	
−0.14	−0.12	−0.54	−0.61		
−0.02	−0.48	−0.56			
−0.38	−0.48				
−0.25					

Enjoyment and Anxiety

5	6	7	8	9	10
0.93	−0.09	−0.07	−0.06	−0.44	−0.53
−0.21	−0.18	−0.16	−0.49	−0.55	
−0.19	−0.16	−0.49	−0.54		
−0.05	−0.43	−0.48			
−0.30	−0.39				
−0.23					

Week 5:

WTC and Enjoyment

5	6	7	8	9	10
0.79	0.80	0.80	0.83	0.85	0.86
0.65	0.64	0.69	0.74	0.75	

(continued)

5	6	7	8	9	10
0.97	0.94	0.92	0.92		
0.95	0.91	0.91			
0.61	0.58				
0.66					

WTC and Anxiety

5	6	7	8	9	10
−0.47	−0.65	−0.67	−0.69	−0.72	v0.66
−0.57	−0.59	−0.60	−0.66	−0.60	
−0.50	−0.50	−0.57	−0.51		
−0.04	−0.30	−0.26			
−0.39	−0.09				
−0.28					

Enjoyment and Anxiety

5	6	7	8	9	10
−0.16	−0.31	−0.34	−0.38	−0.57	−0.56
−0.03	−0.04	−0.11	−0.45	−0.47	
−0.30	−0.30	−0.60	−0.57		
0.21	−0.52	−0.45			
−0.69	−0.48				
−0.50					

Week 6:

WTC and Enjoyment

5	6	7	8	9	10
0.88	0.94	0.57	0.55	0.57	0.77
0.99	0.45	0.45	0.46	0.73	
0.49	0.50	0.52	0.75		
0.52	0.54	0.76			
0.62	0.82				
0.92					

WTC and Anxiety

5	6	7	8	9	10
−0.14	−0.47	−0.39	−0.34	−0.32	0.17
−0.27	−0.24	−0.20	−0.17	0.32	
−0.26	−0.23	−0.20	0.32		
−0.63	−0.49	0.36			
−0.50	0.41				
0.42					

Enjoyment and Anxiety

5	6	7	8	9	10
0.05	−0.43	−0.41	−0.40	−0.37	0.04
−0.30	−0.27	−0.26	−0.22	0.20	
−0.23	−0.23	−0.19	0.23		
−0.32	−0.21	0.35			
0.10	0.57				
0.33					

References

Arnold, J., & Brown, H. D. (1999). A map of the terrain. In J. Arnold (Ed.), *Affect in language learning* (pp. 1–24). Cambridge University Press.

Bernales, C. (2016). Towards a comprehensive concept of willingness to communicate: Learners' predicted and self-reported participation in the foreign language classroom. *System, 56,* 1–12. https://doi.org/10.1016/j.system.2015.11.002.

Bolger, N., & Laurenceau, J. (2013). *Intensive longitudinal methods: An introduction to diary and experience sampling research.* Guilford.

Burgoon, J. K. (1976). The unwillingness-to-communicate: Development and validation. *Communication Monographs, 43,* 60–69. https://doi.org/10.1080/03637757609375916.

Cao, Y. (2011). Investigating situational willingness to communicate within second language classrooms from an ecological perspective. *System, 39,* 468–479. https://doi.org/10.1016/j.system.2011.10.016.

Cao, Y. (2014). A sociocognitive perspective on second language classroom willingness to communicate. *TESOL Quarterly, 48,* 789–814. https://doi.org/10.1002/tesq.155.

Csikszentmihalyi, M. (2009). In S. Lopez (Ed.), *The Encyclopedia of positive psychology* (pp. 394–400). Blackwell Publishing Ltd.

Czimmermann, E., & Piniel, K. (2016). Advanced language learners' experiences of flow in the Hungarian EFL classroom. In P. D. MacIntyre, T. Gregersen, & S. Mercer (Eds.), *Positive Psychology in SLA* (pp. 193–214). Multilingual Matters. https://doi.org/10.21832/9781783095360-009

D'Amico, M. L. (2012). L2 fluency and willingness to communicate: The impact of short-term study abroad versus at-home study. *US-China Foreign Language, 10*(10), 1608–1625.

Dewaele, J.-M., & Dewaele, L. (2017). The dynamic interactions in foreign language classroom anxiety and foreign language enjoyment of pupils aged 12–18. A pseudo-longitudinal investigation. *Journal of the European Second Language Association, 1*(1), 12–22. https://doi.org/10.22599/jesla.6

Dewaele, J.-M., & MacIntyre, P. D. (2014). The two faces of Janus? Anxiety and enjoyment in the foreign language classroom. *Studies in Second Language Learning and Teaching, 4,* 237–274. https://doi.org/10.14746/ssllt.2014.4.2.5.

Dewaele, J.-M., & MacIntyre, P. D. (2016). *The predictive power of multicultural personality traits, learner and teacher variables on foreign anxiety and enjoyment in the foreign language classroom.* Paper presented at the International Conference on Language and Social Psychology, Bangkok.

Dewaele, J.-M., MacIntyre, P. D., Boudreau, C., & Dewaele, L. (2016). Do girls have all the fun? Anxiety and enjoyment in the foreign language classroom. *Theory and Practice of Second Language Acquisition, 2*(1), 41–63.

Dörnyei, Z., & Ryan, S. (2015). *The psychology of the second language learner revisited*. Routledge.

Elahi, S. M., & Taherian, T. (2016). Dynamic emergent patterns of L2 willingness to communicate within the ecology of classroom. *Konin Language Studies, 4*(4), 415–438.

Fredrickson, B. L. (2013). Positive emotions broaden and build. In P. Devine & A. Plant (Eds.), *Advances in experimental social psychology* (Vol. 47, pp. 1–54). Academic Press.

Frenzel, A. C. (2014). Teacher emotions. In L. Linnenbrink & R. Pekrun (Eds.), *Handbook of emotions in education* (pp. 494–519). Routledge.

Frijda, N. H. (1986). *The emotions.* Cambridge University Press.

Ghonsooly, B., Khajavy, G. H., & Asadpour, S. F. (2012). Willingness to communicate in English among Iranian non–English major university students. *Journal of Language & Social Psychology, 31*(2), 197–211. https://doi.org/10.1177/0261927X12438538.

Gregersen, T., MacIntyre, P. D., & Meza, M. D. (2014). The motion of emotion: Idiodynamic case studies of learners' foreign language anxiety. *Modern Language Journal, 98*(2), 574–588. https://doi.org/10.1111/modl.12084.

Hodis, G. M., Bardhan, N. R., & Hodis, F. A. (2010). Patterns of change in willingness to communicate in public speaking contexts: A latent growth modeling analysis. *Journal of Applied Communication Research, 38*(3), 248–267. https://doi.org/10.1080/00909882.2010.490840.

Horwitz, E. K. (2017). On the misreading of Horwitz, Horwitz, and Cope (1986) and the need to balance anxiety research and the experiences of anxious language learners. In C. Gkonou, M. Daubney, & J.-M. Dewaele (Eds.), *New insights into language anxiety: Theory, research and educational implications* (pp. 31–47). Multilingual Matters.

Horwitz, E. K., Horwitz, M. B., & Cope, J. (1986). Foreign language classroom anxiety. *The Modern Language Journal, 70*(2), 125–132. https://doi.org/10.1111/j.1540-4781.1986.tb05256.x.

Joe, H. K., Hiver, P., & Al-, A. H. (2017). Classroom social climate, self-determined motivation, willingness to communicate, and achievement: A study of structural relationships in instructed second language settings. *Learning and Individual Differences, 53,* 133–144. https://doi.org/10.1016/j.lindif.2016.11.005.

Khajavy, G. H., Ghonsooly, B., Hosseini, A., & Choi, C. W. (2016). Willingness to communicate in English: A microsystem model in the Iranian EFL classroom context. *TESOL Quarterly, 50*(1), 154–180. https://doi.org/10.1002/tesq.204.

Khajavy, G. H., MacIntyre, P. D., & Barabadi, E. (2018). Role of the emotions and classroom environment in willingness to communicate: Applying doubly latent multilevel analysis in second language acquisition research. *Studies in Second Language Acquisition, 40*(3), 605–624. https://doi.org/10.1017/S0272263117000304.

Khodadady, E., & Kahjavy, G. H. (2013). Exploring the role of anxiety and motivation in foreign language achievement: A structural equation modeling approach. *Porta Linguarum, 20,* 269–286.

Kleinmann, H. (1977). Avoidance behavior in adult second language acquisition. *Language Learning, 27,* 93–107. https://doi.org/10.1111/j.1467-1770.1977.tb00294.x.

Larson, R., & Csikszentmihalyi, M. (2014). The experience sampling method. In M. Csikszentmihalyi (Ed.) *Flow and the foundations of positive psychology: The collected works of Mihaly Csikszentmihalyi* (pp. 21–34). Springer Netherlands. https://doi.org/10.1007/978-94-017-9088-8_2.

Larsen-Freeman, D. (2016). Classroom-oriented research from a complex systems perspective. *Studies in Second Language Learning and Teaching, 6*(3), 377–393. https://doi.org/10.14746/ssllt.2016.6.3.2.

Larsen-Freeman, D., & Cameron, L. (2008). Complex systems and applied linguistics. *The Modern Language Journal, 92*(4), 644–645.

MacIntyre, P. D. (2012a). Currents and waves: Examining willingness to communicate on multiple timescales. *Contact, 38*(2), 12–22.

MacIntyre, P. D. (2012b). The idiodynamic method: A closer look at the dynamics of communication traits. *Communication Research Reports, 29,* 361–367. https://doi.org/10.1080/08824096.2012.723274.

MacIntyre, P. D. (2017). An overview of language anxiety research and trends in its development. In C. Gkonou, M. Daubney, & J.-M. Dewaele (Eds.), *New insights into language anxiety: Theory, research and educational implications* (pp. 11–30). Multilingual Matters. https://doi.org/10.21832/9781783097722-003

MacIntyre, P. D., Babin, P. A., & Clément, R. (1999). Willingness to communicate: Antecedents and consequences. *Communication Quarterly, 47,* 215–229. https://doi.org/10.1080/01463379909370135.

MacIntyre, P. D., Baker, S., Clément, R., & Donovan, L. A. (2003). Talking in order to learn: Willingness to communicate and intensive language programs. *Canadian Modern Language Review, 59,* 589–607. https://doi.org/10.3138/cmlr.59.4.589.

MacIntyre, P. D., Burns, C., & Jessome, A. (2011). Ambivalence about communicating in a second language: A qualitative study of French immersion students' willingness to communicate. *Modern Language Journal, 95,* 81–96. https://doi.org/10.1111/j.1540-4781.2010.01141.x.

MacIntyre, P. D., & Charos, C. (1996). Personality, attitudes, and affect as predictors of second language communication. *Journal of Language and Social Psychology, 15,* 3–26. https://doi.org/10.1177/0261927X960151001.

MacIntyre, P. D. & Clément, R. (1996). *A model of willingness to communicate in a second language: The concept, its antecedents and implications*. Presented at the World Congress of Applied Linguistics (AILA), Jyväskylä, Finland.

MacIntyre, P. D., Clément, R., Dörnyei, Z., & Noels, K. A. (1998). Conceptualizing willingness to communicate in a L2: A situational model of L2 confidence and affiliation. *Modern Language Journal, 82,* 545–562. https://doi.org/10.1111/j.1540-4781.1998.tb05543.x.

MacIntyre, P. D., & Gardner, R. C. (1991). Language anxiety: Its relation to other anxieties and to processing in native and second languages. *Language Learning, 41,* 513–534. https://doi.org/10.1111/j.1467-1770.1991.tb00691.x.

MacIntyre, P. D., & Gregersen, T. (2012). Emotions that facilitate language learning: The positive-broadening power of the imagination. *Studies in Second Language Learning and Teaching, 2,* 193–213. https://doi.org/10.14746/ssllt.2012.2.2.4.

MacIntyre, P. D., & Legatto, J. J. (2011). A dynamic system approach to willingness to communicate: Developing an idiodynamic method to capture rapidly changing affect. *Applied Linguistics, 32,* 149–171. https://doi.org/10.1093/applin/amq037.

MacIntyre, P. D., MacKay, E., Ross, J., Abel, E. (2017). The emerging need for methods appropriate to study dynamic systems. In L. Ortega & Z. Han (Eds.), *Complexity theory and language development: In celebration of Diane Larsen-Freeman*. John Benjamins.

MacIntyre, P. D., & Vincze, L. (2017). Positive and negative emotions underlie motivation for L2 learning. *Studies in Second Language Learning and Teaching, 7*(1), 61–88.

McCroskey, J. C. (1992). Reliability and validity of the willingness to communicate scale. *Communication Quarterly, 40,* 16–25. https://doi.org/10.1080/01463379209369817.

McCroskey, J. C., & Richmond, V. P. (1991). Willingness to communicate: A cognitive view. In M. Booth-Butterfield (Ed.), *Communication, cognition, and anxiety* (pp. 19–37). Sage.

Mystkowska-Wiertelak, A., & Pawlak, M. (2014). Fluctuations in learners' willingness to communicate during communicative task performance: Conditions and tendencies. *Research in Language, 12,* 245–260. https://doi.org/10.2478/rela-2014-0019.

Pawlak, M., Mystkowska-Wiertelak, A., & Bielak, J. (2016). Investigating the nature of classroom willingness to communicate (WTC): A micro-perspective. *Language Teaching Research, 20*(5), 654–671. https://doi.org/10.1177/1362168815609615.

Peng, J. E. (2014). *Willingness to communicate inside the EFL classroom and beyond: An ecological perspective.* Multilingual Matters.

Peng, J. E., & Woodrow, L. (2010). Willingness to communicate in English: A model in the Chinese EFL classroom context. *Language Learning, 60*(4), 834–876. https://doi.org/10.1111/j.1467-9922.2010.00576.x.

Peng, J. E., Zhang, L., & Chen, Y. (2017). The mediation of multimodal affordances on willingness to communicate in the English as a foreign language classroom. *TESOL Quarterly, 51*(2), 302–331. https://doi.org/10.1002/tesq.298.

Savignon, S. J. (1991). Communicative language teaching: State of the art. *TESOL Quarterly, 25* 261–277.

Uy, M. A., Foo, M.-D., & Aguinis, H. (2010). Using experience sampling methodology to advance entrepreneurship theory and research. *Organizational Research Methods, 13,* 31–54. https://doi.org/10.1177/1094428109334977.

van Dijk, M., Verspoor, M., & Lowie, W. (2011). Variability and DST. In M. Verspoor, K. de Bot, & W. Lowie (Eds.), *A dynamic approach to second language development: methods and techniques* (pp. 55–84). John Benjamins Publishers.

Weaver, C. (2005). Using the Rasch model to develop a measure of second language learners' willingness to communicate within a language classroom. *Journal of Applied Measurement, 6*(4), 396–415.

Wood, D. (2016). Willingness to communicate and second language speech fluency: An idiodynamic investigation. *System, 60,* 11–28. https://doi.org/10.1016/j.system.2016.05.003.

Yashima, T., MacIntyre, P. D. & Ikeda, M. (2016). Situated willingness to communication in an L2: Interplay of individual characteristics and contextual factors. *Language Teaching Research*, 1–23.

Yue, Z. (2014). Chinese university students' willingness to communicate in the L2 classroom: The complex and dynamic interplay of self-concept, future self-guides and the sociocultural context. In K. Csizér & M. Magid (Eds.), *The impact of self-concept on language learning* (pp. 250–267). Multilingual Matters. https://doi.org/10.21832/9781783092383-015.

Zirkel, S., Garcia, J. A., & Murphy, M. C. (2015). Experience-sampling research methods and their potential for education research. *Educational Researcher, 44*(1), 7–16. https://doi.org/10.3102/0013189X14566879.

Gholam Hassan Khajavy is Assistant Professor of Applied Linguistics at University of Bojnord, Iran. His main research interests are psychology of language learning and teaching with a focus on willingness to communicate, motivation, and emotions. He has published in different international journals such as *TESOL Quarterly*, *Studies in Second Language Acquisition*, *Contemporary Educational Psychology*, and *Teaching and Teacher Education*.

Peter D. MacIntyre is Professor of psychology at Cape Breton University. His research focusses on the psychology of language and communication. He has published over 100 articles and chapters on language anxiety, willingness to communicate, and motivation. He has co-authored or co-edited books on topics including *Positive Psychology in SLAMotivational Dynamics, and Teaching Innovations*. His awards include the Gardner Award (International Association for Language and

Social Psychology) and the Mildenberger Prize (Modern Language Association) for contributions to the study of language.

Tahereh Taherian is a Ph.D. candidate of TEFL at Yazd University, Iran. Her main research interest is the ecology of foreign language learning and teaching. She has published in different international journals such as *International Journal of Bilingual Education and Bilingualism*, *Journal of Psycholinguistic Research*, and *Frontiers in Psychology*.

Jessica Ross received her Bachelor of Arts—Honours in psychology from Cape Breton University in 2017. She is currently pursuing her Ph.D. in social psychology at the University of Waterloo. Her current research focuses on examining peoples' ability to regulate their own motivation. Aside from motivation and self-regulation, Jessica's other research interests include positive psychology, romantic relationships, and threat and defense.