

Rethinking data collection on language contact: The language contact score

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Language contact has long been recognised as one of the most important factors impacting on second language acquisition (SLA), particularly in an immersion or study abroad (SA) context. Interaction in the target language has been established as a predictor of gains in second language (L2) abilities,¹ and has a particularly important relationship with the development of L2 oral proficiency². Yet, certain difficulties exist in the collection of language contact data, and at present, no current consensus exists on how this type of data can best be accurately gathered and measured for use in linguistics research.

For instance, interview-based³ or ethnographic studies⁴ typically allow researchers to gain a comprehensive view of learners' experiences in SA or immersion contexts. Their shortcomings exist, however, in that many of these projects have few participants and may be limited to a single context. While their insight into the SA experience, and particularly their analyses of learners' language contact, is typically thorough and detailed, researchers may be limited because of time constraints and the impracticalities of investigating many participants over a given period of time abroad.

In contrast, questionnaires have also long been utilised as research tools for gathering data on language contact⁵, and can easily be distributed to a large number of participants across a number of different contexts. Yet, many are ultimately limited; they tend to be developed for each specific study, leaving minimal provision for direct

¹ Paul Meara, "The Year Abroad and Its Effects," *Language Learning Journal* 10, no. 1 (1994).

² T. A. Hernández, "The Relationship among Motivation, Interaction, and the Development of Second Language Oral Proficiency in a Study-Abroad Context," *The Modern Language Journal* 94, no. 4 (2010); N. Segalowitz and B. F. Freed, "Context, Contact, and Cognition in Oral Fluency Acquisition: Learning Spanish in at Home and Study Abroad Contexts," *Studies in Second Language Acquisition* 26, no. 2 (2004).

³ Robert DeKeyser, "Monitoring Processes in Spanish as a Second Language During a Study Abroad Program," *Foreign Language Annals* 43, no. 1 (2010); Christina Isabelli-Garcia, "Study Abroad Social Networks, Motivation and Attitudes: Implications for Second Language Acquisition," ed. E. Churchill and M. DuFon (Clevedon, UK: Multilingual Matters, 2006).

⁴ Lorraine Brown, "An Ethnographic Study of the Friendship Patterns of International Students in England: An Attempt to Recreate Home through Conational Interaction," *International Journal of Educational Research* 48(2009); Celeste Kinginger, "Language Learning in Study Abroad: Case Studies of Americans in France," *Modern Language Journal* 92(2008).

⁵ Jim Coleman and Tony Chafer, "The Experience and Long-Term Impact of Study Abroad by Europeans in an African Context," ed. Fred Dervin (Newcastle: Cambridge Scholars Publishing, 2011); Meara, "The Year Abroad and Its Effects."

comparison between other studies and variables, and limiting the researcher in terms of what inferences they might make about students' experiences while abroad⁶.

Nevertheless, in order to overcome these limitations, some researchers have systematically employed similar styles of questionnaire so that the data may ultimately be compared across groups, learning contexts and time periods. For example, tools developed by Barbara Freed and her colleagues focus on the number of hours participants spend 'in contact' with the target language⁷, yet their Language Contact Profile relies heavily on participants' self-reflection over a long period of time and does not take into consideration the differences between active and passive language⁸. Conversely, Dan Dewey and his colleagues have designed a series of studies which examine learners' social networks abroad⁹; however, they tend to focus more on with whom participants interact rather than the frequency of interaction and rely heavily on potentially inaccurate self-reporting of friendship groups and subsequent linguistic development.

The Language Contact Score

The present study therefore proposes a new approach to language contact data collection which measures both the quality and quantity of L2 interaction in a single mathematical calculation: The Language Contact Score (LCS). By doing so, it hopes to overcome many of the limitations present with the above data collection methods and establish a quantifiable language contact measurement that can be compared and statistically analysed along with other affective variables common in SA research.

In order to do so, data is first gathered via a questionnaire based on the designs of other prominent research projects¹⁰ (see appendix A). Participants are asked to list a

⁶ Jim Coleman, "Researching Whole People and Whole Lives," in *Social and Cultural Aspects of Language Learning in Study Abroad*, ed. Celeste Kinginger (Amsterdam: John Benjamins, 2013).

⁷ B. F. Freed et al., "The Language Contact Profile," *Studies in Second Language Acquisition* 26, no. 2 (2004); B. F. Freed, N. Segalowitz, and Dan P. Dewey, "Context of Learning and Second Language Fluency in French: Comparing Regular Classroom, Study Abroad, and Intensive Domestic Immersion Programs," *ibid.*, no. 02.

⁸ DeKeyser, "Monitoring Processes in Spanish as a Second Language During a Study Abroad Program."

⁹ Dan P. Dewey, R Kirk Belnap, and Rebecca Hillstrom, "Social Network Development, Language Use, and Language Acquisition During Study Abroad: Arabic Language Learners' Perspectives," *Frontiers: The Interdisciplinary Journal of Study Abroad* 22(2013); Dan P. Dewey et al., "Social Network Formation and Development During Study Abroad in the Middle East," *System* 41, no. 2 (2013).

¹⁰ Àngels Llanes, Elsa Tragant, and Raquel Serrano, "The Role of Individual Differences in a Study Abroad Experience: The Case of Erasmus Students," *International Journal of Multilingualism* 9, no. 3 (2012); Raquel Serrano, Elsa Tragant, and Àngels Llanes, "A Longitudinal Analysis of the Effects of One Year Abroad," *The Canadian Modern Language Review* 68, no. 2 (2012).

number of individuals with whom they interact across various social contexts (e.g. at home, or during free time) and then indicate which language they use with each individual and the frequency with which they interact on a weekly basis. Then, an analysis is conducted in order to assess both the quality and quantity of L2 interaction using the LCS calculation based on above variables. The scores themselves can then be compared between groups or across different groups or learning contexts, and the data collection questionnaires can easily be distributed both electronically or using paper copies.

LCS Calculation

In order to evaluate language contact in this way, the LCS calculation employs a weighted, exponential scale, rather than a simple linear scale, which favours prolonged interaction in the L2 and uniquely addresses the potentially negative effects of extensive L1 use abroad. The difference can best be illustrated by example; below social interactions ‘At Home’ are explored, and interactions across other social contexts can be calculated similarly. In these examples, evidence from a pilot project on American learners of Spanish is presented, while the method itself could be applied to learners of any language across a number of contexts.

Table 1: Mary’s LSC in the ‘At Home’ context (unweighted approach)

Housemates	Language Used	Frequency of Interactions	Language x Frequency	Interaction Score
Person 1	0	5	0	(0+12+12)/3 housemates = 8
Person 2	4	3	12	
Person 3	4	3	12	

Data gathered from the LCS questionnaire (see appendix A) is illustrated in Table 1 and depicts the results given by Mary (a pseudonym), who is studying Spanish abroad in Barcelona. In this example, Mary has three housemates with whom she interacts regularly: Person 1 is another American student while Persons 2 and 3 are Spanish students who study at a local university. With Person 1, Mary speaks exclusively English, and she speaks to this person on a very frequent basis. With Persons 2 and 3 she speaks exclusively Spanish; however, she only interacts with these individuals ‘a few times a week.’ The ‘Language Used’ value gives Mary a score of 0 for Person 1 as to ensure that interactions in English are not awarded any value in terms of L2 contact, while Persons 2 and 3 are awarded a ‘Language Used’ value of 4, the maximum score possible, because the interactions are exclusively in Spanish. In other examples, the participants might indicate that they speak both Spanish and English to another individual, therefore the 0-4 scale will be able to account for such use. Interactions in any language other than

Spanish are also assigned a 0 value in order to maintain consistency and ensure that Spanish is the only language measured by the LCS in this example.

In terms of 'Frequency,' interactions with Person 1 are very frequent, therefore receiving the highest score of 5, while interactions with Persons 2 and 3 are given scores of 3 because the interactions are less frequent. This relates directly to the frequency questions on the LCS questionnaire (see appendix A, 1c): interactions everyday receive the maximum score of 5 while rare interactions are given the minimum score of 1.

In order to determine Mary's LCS, the language of interaction, on its 0-4 scale, is multiplied by the frequency of the interaction, on its 1-5 scale. The maximum score possible per housemate in this context could, therefore, be 20, while in Mary's case, Person 1 still receives a value of 0 for his/her interactions in English, while Persons 2 and 3 are awarded values of 12 each for their moderately frequent interactions in Spanish.

Next, it is necessary to take into account all of Mary's interactions while at home with all of her housemates, which would be measured by combining all of her housemates' individual scores, 0, 12 and 12 in this case, and dividing them by the total number of housemates (see Table 1): $(0 + 12 + 12)/3 = 8$.

Using a linear, unweighted scale, Mary would receive a score of 8 out of a total 20 for her L2 interaction score in this social context; however, this type of calculation would assume that Mary's social time at home is equally distributed between her housemates, which is untrue as Mary clearly spends more of her time with Person 1 and less with the other housemates. It can also be assumed that because of Person 1's presence in the house, Mary is less likely to have frequent and sustained interactions in Spanish, which are ultimately going to benefit her acquisition more than infrequent interactions.

Therefore, it is essential to assign a weighting factor to interactions in Spanish based on their potential to benefit L2 acquisition. Doing so will also account for Person 1, who does not necessarily have an impact on the total score, but who is occupying Mary's time that could be spent with the remaining housemates conversing in the L2. This will ensure that frequent interactions in Spanish are given a much higher value than infrequent interactions because the quality of language utilised in sustained conversation is much more beneficial to learners than infrequent or routine conversations¹¹; additionally, it will also take into account that frequent interactions in English may detract from the amount of time a participant could be speaking in Spanish.

¹¹ Coleman, "Researching Whole People and Whole Lives; Kinginger, "Language Learning in Study Abroad: Case Studies of Americans in France."

Table 2: Mary’s LSC in the ‘At Home’ context (weighted approach)

Housemates	Language Used	Frequency of Interactions	Language x Frequency	Score Ratio	Corrected Value	True LCS
Person 1	0	5	0	0		(0+7.2+7.2)/ 3 housemates = 4.8
Person 2	4	3	12	60%	7.2	
Person 3	4	3	12	60%	7.2	

Table 2 uses the same data and tries to address this bias by incorporating a weighting factor that involves all housemates: the ‘Score Ratio’ is each housemate’s ‘Language x Frequency’ score divided by the maximum language points available, 20, and then multiplied by 100 to indicate the percentage of their total possible impact on Mary’s social interaction time out of 100%. This then accounts for each housemate’s impact relative to the entire group of housemates. Hypothetically, if Mary spoke Spanish as frequently with Persons 2 and 3 as she does with Person 1 in English, then they would receive the maximum ‘Score Ratio’ of 100%; however, as she only speaks with them with moderate frequency, their ‘Language x Frequency’ scores are only weighted at 60% of the entire possible impact.

Each ‘Language x Frequency’ score is then multiplied by its impact ratio in order to calculate a ‘Corrected Value.’ This value represents each housemate’s interaction points relative to their potential impact on Mary’s L2 use and their impact on Mary’s social time at home relative to the other housemates. By making this extra calculation, Mary now receives a LCS of 4.8 rather than 8, which reflects her L1 use relative to her L2 use in this context: while Mary does appear to have meaningful interactions in Spanish with Persons 2 and 3, the amount of time she spends speaking in English with Person 1 significantly detracts from her total social interaction time at home.

Table 3 provides another example to illustrate how the LCS can account for both the quantity and quality of interactions, offset by the use of English as a detracting factor. In this example, Holly, a student studying Spanish in Granada, has four housemates. From her questionnaire data (see appendix A, 1b), we know that Persons 1 and 2 are other SA students, while persons 3 and 4 are local Spanish residents. Holly interacts very frequently with her other SA housemates, mostly in English, but at times in Spanish, perhaps when all of her housemates are interacting together. Hence, she receives a score of 1 for Persons 1 and 2. She receives the maximum score for Persons 3 and 4 because their interactions are exclusively in Spanish. In terms of the frequency of interactions, Holly speaks with Persons 1, 2 and 4 everyday, hence receiving a frequency score of 5, and Person 3 ‘a few times a week,’ hence the frequency score of 3.

Table 3: Holly's LCS in the 'At Home' context (weighted approach)

Housemates	Language Used	Frequency of Interactions	Language x Frequency	Score Ratio	Corrected Value	True LCS
Person 1	1	5	5	25%	1.25	(1.25+1.25+7.2+20)/ 4 housemates = 7.43
Person 2	1	5	5	25%	1.25	
Person 3	4	3	12	60%	7.2	
Person 4	4	5	20	100%	20	

Next, it is necessary to take into account that Holly's interactions with Person 4 are going to be the most meaningful to her Spanish development, while Persons 1 and 2 are not as beneficial for Holly in terms of Spanish practice because she mainly speaks to them in English. This is not to say that her interactions with Persons 1 and 2 are not beneficial to any extent, but simply that her frequent interactions with Person 4 are more beneficial. Therefore, Persons 1 and 2 receive a 'Score Ratio' of 25%, meaning that only 25% of their possible 'Language x Frequency' score will be counted towards Holly's total LCS. Conversely, Person 4 is given a 'Score Ratio' of 100%, meaning that all of his/her 'Language x Frequency' points will be counted towards Holly's total LCS.

This method ensures that frequent interactions are favoured when compared to infrequent interactions. Its weighted scale also warrants that prolonged, frequent interactions are exponentially more beneficial for the participants than occasional, brief interactions because they challenge learners to negotiate meaning¹². Furthermore, it provides a means through which interactions in English can be taken into account when investigating a participant's total possible time available for social interactions.

Validation of the LCS

While the quantitative nature of the LCS provides a method through which language contact data can be both calculated and used in statistical analysis, its validation as a viable research tool must also be considered. As such, in its pilot project, a number of observations were made alongside LCS calculations in order to test the reliability of the responses provided by participants and the score's legitimacy as a research tool¹³.

¹² Robert DeKeyser, "Study Abroad as Foreign Language Practice," ed. Robert DeKeyser (New York: Cambridge University Press, 2007); "Monitoring Processes in Spanish as a Second Language During a Study Abroad Program."

¹³ Kassie A. Cigliana, "The Dynamic Nature of Individual Experiences in Study Abroad: Motivational Perspectives, Language Contact and the Development of Social Relationships," (Southampton: University of Southampton, 2015).

For instance, based on observational data from the pilot project, the data confirm that Mary had a much stronger friendship with her English-speaking housemate than with her Spanish-speaking housemates. While these moderately frequent interactions in Spanish are beneficial for Mary as a learner, it is clear that the majority of her interactions, at home and in other social contexts, were in English¹⁴. If Mary is constantly interacting with her English-speaking close friends, this leaves less time for Mary to be interacting in Spanish in her various social experiences; the LCS will, therefore, take into account the total amount of interaction time and how much is spent using English rather than Spanish.

In addition, based on interviews with Holly during the pilot project, she reveals that she had lunch every day with her host mother (Person 4), with whom she had a good relationship and spoke frequently. During the lunchtime meal, her other housemates may have been present, but as two of them were also SA students and learners of Spanish, the conversation in Spanish was driven mainly by the host mother. Holly may have asked simple questions to her other housemates in Spanish, but based on Holly's descriptions of her home life, the conversations mainly involved the host mother asking questions to all of the students¹⁵. Thus, the host mother in this example is clearly the most important Spanish influence in the house, an aspect which the LCS will acknowledge.

Limitations

While validation of the LCS is still on-going, it is important to recognise the limitations associated with this new data collection method. For instance, it cannot be guaranteed that L2 interactions occurring 'everyday' are prolonged and therefore beneficial to learners. Also, as with other self-reporting data-collection methods, inaccuracies or over-generalisations in the participants' responses are a possibility. Thus, further piloting of the LCS is necessary in hopes that in future it can be proven as a more reliable tool than such 'time-on-task' questionnaires¹⁶ or descriptions of social networks¹⁷ for analysing language contact and social interactions that are beneficial to SLA.

Furthermore, the LCS cannot aim to replace such comprehensive data collection methods as ethnographies, case studies or longitudinal, interview-based studies in providing details on learners' development in an ever-changing environment while abroad. This limitation, however, may be overcome by administering the LCS

¹⁴ Cigliana, "The Dynamic Nature of Individual Experiences in Study Abroad: Motivational Perspectives, Language Contact and the Development of Social Relationships."

¹⁵ Cigliana, "The Dynamic Nature of Individual Experiences in Study Abroad: Motivational Perspectives, Language Contact and the Development of Social Relationships."

¹⁶ Freed et al., "The Language Contact Profile."

¹⁷ Dewey, Belnap, and Hillstrom, "Social Network Development, Language Use, and Language Acquisition During Study Abroad: Arabic Language Learners' Perspectives; Dewey et al., "Social Network Formation and Development During Study Abroad in the Middle East."

questionnaire on multiple occasions over the course of a study in order to document changes in social relationships and language use.

Implications and Conclusion

In summary, the LCS presents an innovative means through which the language contact, and more specifically the types of social interactions, of SA participants can be examined and compared across a group of many participants and subsequently compared with other SLA variables using statistical analyses. Furthermore, while it could never assume to be a replacement for true ethnographic data, it could present a means through which information about social groups and social interactions could be elicited, via this innovative style of questionnaire, and then compared across other participant groups in other learning contexts. The formula itself could also, in theory, provide a LCS calculation for participants' interactions with many individuals across all social contexts to truly illustrate the impact of the L2 on that participant comparative to its impact on others and how sustained use of the L1 might detract from the impact of L2 conversations.

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Appendix A: LCS Data Collection Questionnaire Example

Study Abroad in Spain

Name: _____

This survey is going to ask you questions about with whom you interact, how often you interact with each person and what languages you speak. The same person may appear across several contexts (ie. someone you live with and also have class with).

1a. Where do you live in Spain?

Apartment Home stay Residence Hall Other
 (specify): _____

1b. With whom do you live? Use the following chart to describe those you live with (if any):

Nationality	Native Language	Age	Language(s) you use with this person
1.			
2.			
3.			
4.			

1c. Describe how often you interact with each person with whom you live (Mark your answers with an [X]):

Person	Everyday	Several Times a Week	A Few Times a Week	A Few Times a Month	Rarely
1					
2					
3					
4					