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Thinking Allowed

Language learning in a study-abroad context: Research agenda

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1. Introduction

Isabelli-García, Bown, Plew & Dewey (forthcoming) presented the 'state of the art' in research on language learning abroad. Beginning with Carroll's (1967) claim that 'time spent abroad is one of the most potent variables' predicting second language (L2) abilities (p. 137), the scope of study-abroad research has grown multifold in guiding theoretical frameworks, empirical methods, and objects of examination. A half-century of work surveyed in Isabelli-García et al.'s review reveals diverse goals of investigation, ranging from studies focusing on documenting learning outcomes, to studies aiming to unveil the process and nature of learning in a study-abroad context.

In this paper, we will reprise several critical areas in their review, as well as new areas emerging from our writing, in order to identify current research problems and set up concrete research tasks that can address the problems. In doing so, we will first explain what those problems are, why we regard those problems as important to address, and how such future research can be conducted. In the following, we will outline four main problem areas for this research agenda: (1) engaging in theory construction that both builds and tests hypotheses, (2) including intercultural communicative competence as outcomes of study abroad, (3) understanding pre-programmatic abilities (participants' abilities and potential at pre-departure) that can maximize study-abroad experience, and (4) advancing methods for investigating social contact while abroad. While this list is far from exhaustive, we hope that it provides a clear perspective and representative indication of possibilities in the future study-abroad research.

2. Research agendas and tasks

2.1 Research needs for engaging in theory construction that both builds and tests hypotheses

Eisenhardt & Graebner (2007), who examine the differential roles of qualitative and quantitative research in theory construction, argue that such a process requires both building

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and testing theory. Qualitative research is largely (though not exclusively) inductive, focusing on small samples and case studies largely to build theory, identifying new factors and hypotheses (see also Porte & Richards 2012). Quantitative research is largely (yet not entirely) deductive, studying large samples with statistical tools to test theory. Both approaches should work together so that theory can be confidently extrapolated to populations of learners. According to Isabelli et al. (forthcoming), prominent study-abroad researchers such as Coleman (2013) contend that, since individual trajectories are the focus of recent study-abroad research, investigators have shifted their focus from quantitative to qualitative approaches. Additionally, Isabelli et al. argue that quantitative research can only 'hint at' what qualitative research can uncover. To the extent that Isabelli et al.'s thorough and comprehensive review of study-abroad research does not identify that theory construction is or has ever been a priority, we contend that both theory building and testing alongside quantitative and qualitative replication (cf. Porte & Richards 2012) should become a priority.

For instance, a number of qualitative studies have described learners' participation in the local community and explained how they developed certain linguistic knowledge through their experiences in the community (Shively 2013; Diao 2016). Using a micro-generic approach, these studies suggest that context, language use, and learning outcomes interact in consequential ways, perhaps in ways that would not become evident in the typical classroom. Still, larger scale studies are needed to test this interaction for theory construction to progress.

A few quantitative studies have examined the causality relationship among context, learner characteristics, and learning outcomes. Matsumura (2003) used the Structural Equation Model to reveal the effects of proficiency and language exposure in L2 English learners' changes in their recognition of speech acts (i.e., selecting an appropriate expression when giving advice to someone who is in a superior or equal power relationship). Using Latent Curve Growth Modeling, Taguchi, Xiao & Li (2016) assessed the impact of intercultural competence and social contact on L2 Chinese learners' gains in the production of speech acts (e.g., requests, refusals). However, these quantitative approaches could contribute more to our understanding of study abroad with a combination of techniques that examine the extent to which simple, linear and single-factor explanations account for learning, along with qualitative data.

In order to construct knowledge about and a theory of study abroad – rather than accumulating knowledge – we need a study that can produce generalizable findings about certain language practices leading to certain learning outcomes. To this end, we propose implementing the concept of DOMAINS OF PRACTICE or situations of language use (Fishman 1972) as a frame of reference to examine study-abroad experience. Specifically, we propose a corpus-linguistics approach for systematically analyzing patterns of language use in a specific domain and using the analysis to develop a test assessing learning outcomes occurring in that domain. Although the relationship between study-abroad experience and learning outcomes has been addressed for quite some time qualitatively and quantitatively, both approaches have limitations. A number of quantitative studies examined correlations between language contact and learning outcomes. Yet, these studies examined study-abroad experience in a vacuum and did not analyze the actual experience within specific domains of language use (e.g., club activities, part-time jobs), lacking the theory building aspect (what specific experiences and practices in the context can lead to learning). On the other hand, qualitative studies typically

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described how individual and contextual elements shape learning trajectories while abroad, although these studies often take a case-study approach illustrating a very specific interaction (e.g., a dinner-table conversation) of a specific individual, lacking the theory testing aspect (whether the specific experience uncovered in the data can actually lead to learning across contexts and individuals). We believe that the research task presented below can enhance the current practice to reveal the link between study-abroad experience and learning outcomes, which can address both theory building and theory testing.

Research task 1
Use Domains of Practice as a framework of study-abroad experiences

The local community involves a variety of domains of practice, each characterized by different participant memberships, goals, and conventions of interaction. For example, the domain of service encounter involves a server and customer oriented toward the mutual goal of a smooth service transaction. Because of this goal-oriented nature, interactions in this domain often display a fixed, predictable sequence and formulaic expressions that signal the sequence (e.g., 'How can I help you?', 'I want/need . . .', 'Thank you'). In contrast, homestay settings exhibit different linguistic and interactional characteristics. In a family conversation, participants engage in discourse that often evolves in multiple directions. Narratives characterized by elaborate sentences are common, along with slang, colloquial forms, and affective language shared among in-group members (part of pragmatic competence). Because different domains of practice involve different patterns of speaking, learners need to develop an understanding of language specific to given domains so they can navigate across various domains by using appropriate linguistic resources.

The concept of DOMAINS OF PRACTICE is useful when investigating the causal relationship between the study-abroad context and linguistic gains. We can examine whether learners' participation in a particular domain leads to learning outcomes by assessing the use of linguistic forms and interactional patterns specific to that domain. Once such a causal relationship is established, we can also apply the findings to predict learning outcomes in study abroad. We can examine whether amount and nature of participation in a particular domain can predict learning outcomes of linguistic forms and interactional patterns characteristic of the domain.

A research design that helps explore the context–learning connection might include three phases. The first phase involves identifying the social domains which learners are likely to engage in using the L2 abroad. This can be done via survey or interview, asking learners where they typically use the L2, with whom, and for what purposes. Researchers can also analyze study-abroad curricula and programs for the types of activities involved, while they should keep in mind that they vary across programs. For example, researchers can observe a group of learners to identify common venues of L2 use. Several domains of practice will emerge in this process, such as homestay settings, dorm room interactions, service encounters, club activities, tutoring sessions, and classroom interactions. Although identifying these domains might be challenging due to their diversified nature, researchers can start their analyses

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individually and locally. They can interview individual learners for specific locations where they gather and use L2.

After identifying core domains of practice among learners, conversations occurring within each domain can be recorded, transcribed, and compiled as data. Those conversations will be mostly among local members, rather than between locals and L2 learners, because a small population of L2 learners is not representative in local domains.[1] After compiling the data, a corpus-linguistics approach can be applied to understand prominent linguistic features. Automated analyses of a large, principled collection of naturalistic language use can reveal what linguistic forms, vocabulary, and formulaic expressions occur frequently in each domain and thus characterize the domain. For example, in a Japanese study-abroad setting, classroom conversations are likely to involve the polite speech style (e.g., copula *desu/masu* at utterance ending) to a greater extent than home-stay conversations, while honorifics (humble and respect forms) probably appear more frequently in the domain of workplaces (both full-time and part-time jobs). The qualitative approach typically emphasizes individual variation in learners' experiences, but the purpose of the quantitative, corpus-linguistics approach is to reveal representative patterns of language use that can profile a linguistic practice in a certain domain.

By typifying membership, activity, and patterns of interaction within and across domains and conducting a corpus-based analysis, linguistic features and ways of speaking specific to individual domains will emerge. The last research phase is to use those linguistic features as criteria to analyze learners' linguistic abilities. Researchers can develop a task that elicits and assesses knowledge of typical grammatical forms and lexis in given domains. The task can be administered at the beginning and end of a study-abroad period to examine changes in learners' receptive knowledge of linguistic forms and their abilities to actually use those forms. Learners' changes in their knowledge and abilities can also be analyzed by their degree of involvement in the domains of practice, which can be assessed from obtain data on learners' amount and intensity of social contact in each domain (see Section 2.4). Regression analysis can be conducted with social contact as an independent variable and linguistic gains as a dependent variable. If there is a significant main effect for social contact on linguistic gains, we can draw a causality interpretation between study-abroad experiences and language development, such that greater participation in a certain domain of practice actually leads to learning representative linguistic features in that domain. If no such effect holds, researchers can explore why exposure does not lead to learning by considering the property of target linguistic forms as well as the nature of practice involved in the domain (e.g., input, output, and interaction-based practice). Researchers can collect qualitative data from interviews, observations, and field notes to gain detailed accounts of participants' nature of practice in the local community.

2.2 Research needs for redefining the study-abroad outcomes with explicit focus on linguistic and intercultural development combined

A number of studies have examined study-abroad outcomes from the perspective of linguistic gains, language socialization, and intercultural development (e.g., Collentine & Freed 2004;

[1] As one reviewer pointed out, L2 learners may not have full access to language use shared among local members, and thus corpora based on local members' language use may not be authentic to learners.

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DuFon & Churchill 2006; Savicki 2008; Jackson, 2009, 2010; Kinginger 2013; Jackson 2015). Only a few studies have analyzed linguistic gains and intercultural development together in a study-abroad context. Many of these studies have used self-reports and survey items when assessing linguistic competence. As a result, they assess 'perceived' linguistic competence as part of intercultural competence. A handful of studies have assessed intercultural competence and linguistic competence as distinct independent variables to test whether hypotheses about the interaction between these two competencies gleaned from self-reports and surveys can be confirmed and whether they interact over the course of development (Vande Berg, Paige & Lou 2012; Taguchi 2015; Watson & Wolfel 2015; Taguchi, Xiao & Li 2016). As a result, we do not know the precise impact (if any) of one variable on the other.

The weak connection between linguistic studies and intercultural studies has been noted in the recent literature. Fantini (2009) pointed out the 'inattention' to language needs, which needs to be corrected in the new conceptualization of intercultural communicative competence. Byram (2012) also acknowledged that, despite the large pool of research available in bilingualism, there is surprisingly little research on bicultural competence. Hence, more research is needed to reveal linguistic competence and its effect on intercultural development in a study-abroad program (or vice versa – how intercultural competence affects linguistic development).

The conjoined analysis of linguistic competence and intercultural competence aligns well with the current trends of intercultural education in universities and colleges. Facing the demands of an increasingly globalized society, many higher-education institutions have spent substantial resources in internationalizing education to prepare students for the global workforce. Currently 85% of top US universities have promoted intercultural competence as one of the core learning goals (Stemler 2012). Study-abroad programs have been a significant component of universities' strategic plans for achieving this goal.

Just as intercultural learning is part of the higher-education mission, intercultural knowledge and skills have been situated as part of the learning outcomes in foreign-language curricula (ACTFL 2015). Because effective communication among and across cultures largely depends on learners' cultural awareness and understanding, intercultural competence occupies a critical dimension of language learning. The connection between language and cultural learning has been advocated by a number of researchers (for a review see Garrett-Rucks 2016). A primary example is Byram's (1997, 2012) model of intercultural communicative competence. Byram (1997) conceptualized language ability as involving more than just the ability to exchange information or participate in communicative situations: it extends to the ability to relate to others by mediating differences between one's own and other's cultures. His model situates communicative competence (linguistic, sociolinguistic, and discourse competencies) on one side and intercultural competence on the other, which entails five sub-components: (1) knowledge, (2) skills of interpreting and relating, (3) cultural awareness, (4) skills of discovery, and (5) attitudes (curiosity and openness). These sub-components are considered to assist our process of becoming an intercultural speaker.

In summary, foreign-language learning and study abroad have been promoted as part of efforts of internationalization in higher education. Language learning involves more than learning grammar, vocabulary, and pragmatics of the language. It also entails relating to other cultures and recognizing one's own cultural positioning. In line with these trends, study-abroad

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outcomes should be conceptualized as the development of intercultural communicative competence and analyzed in conjunction with linguistic development.

The next section presents a more detailed discussion of various models of intercultural competence and how those models can help us develop an assessment measure of intercultural and linguistic competencies. By presenting a research direction in this area, we intend to contribute to the emerging literature that aims at developing an intervention program to support and extend students' intercultural learning and engagement while abroad (e.g., Paige & Vande Berg 2012; Jackson 2014, 2015, 2016).

Research task 2
Include intercultural competence as learning outcomes

The first phase involves identifying an appropriate theoretical model of intercultural competence. Because not all models situate language competence as a core constituent, researchers need to select a model that incorporates both linguistic and cultural components. One example is Byram's (1997, 2012) model described above. Others include Kelley & Meyers (1995) and Deardroff's (2006) models. Kelley & Meyers's model incorporates perceptual acuity as a core trait of cross-cultural sensitivity. Perceptual acuity is one's ability to pay attention to verbal and nonverbal cues in communication and is thus closely related to L2 competence. Deardroff, on the other hand, conceptualizes intercultural competence as consisting of two areas, with individuals' traits/attitudes and knowledge/skills. The former includes personal characteristics such as openness, flexibility, and empathy. The latter involves cognitive skills of observing, analyzing, interpreting, evaluating, and relating, which can be operationalized as L2 skills. Due to limited space we have discussed only a few exemplary models, but researchers need to recognize that the choice of a theoretical model essentially affects the design of their empirical research. Hence, they need to consider the nature of their study-abroad program and its local context to select an appropriate model.

Once the theoretical model is identified, the next phase is developing tasks assessing intercultural competence. Researchers can adopt existing instruments. Fantini (2009) discusses a range of tools, including direct and indirect assessments, self-report and performance assessments, and aptitude and attitude tests. For example, Kelley & Meyers (1995) developed a survey instrument (50 Likert-scale items), which assesses cross-cultural sensitivity in four dimensions: emotional resilience, flexibility/openness, perceptual acuity, and personal autonomy. Byram's framework led to the development of the Intercultural Competence Assessment (2004), which measures intercultural competence in six dimensions: ambiguity tolerance, flexibility, communicative awareness, knowledge discovery, respect for otherness, and empathy. This tool includes three parts: intercultural profile survey (21 Likert-scale items), intercultural encounters (scenario-based questions), and construction (role play).

If no ready-made instrument is available for a particular theoretical model, researchers can develop their own measures. Taking the Deardroff (2006) framework as an example, core intercultural traits can be assessed using a publicly available instrument, but the skill dimension can be assessed with an original task. For example, target language skills for analyzing, interpreting, and relating can be assessed using a task illustrating cross-cultural

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conflicts. Because intercultural cooperation requires synergy among different perspectives, the ability to recognize misunderstandings and lead a group toward common solutions is a critical aspect of intercultural competence. Assessing such ability is no easy task and can take a range of formats, but there is a way to attempt this. For example, researchers can create a scenario illustrating a conflict situation of two characters coming from a different culture by providing background information, followed by a narrative of each character's perspective on the issue. After reading the scenario, participants can suggest how this situation can be improved by providing advice to each character in the scenario. Participants' advice can be assessed on three aspects: (1) degree of perspective-taking (whether the advice incorporates both characters' perspectives); (2) clarity of communicative intention (whether the advice is clear, including explicit plans for the characters to follow); and (3) appropriateness of language use (whether the language used to provide advice is appropriate, showing respect and consideration).

Critically, it is important to use multiple measures to assess intercultural communicative competence to enhance validity of the assessment practice. In addition to developing an original task like the one above, researchers can use other established psychometric instruments. There are a number of tools available (for a review, see Fantini 2009). For example, the Intercultural Development Inventory (IDI), which is based on the Developmental Model of Intercultural Sensitivity (Hammer, Bennett & Wiseman 2003), has been widely used. The Multicultural Personality Questionnaire (MPQ) (Van der Zee & Van Oudenhoven 2001) is another established instrument that can assess different dimensions of intercultural competence (e.g., cultural empathy, emotional stability, and flexibility). Like IDI, MPQ is supported by high reliability across different countries in a number of studies (Leong 2007).

The final phase involves using the instrument to capture intercultural development among study-abroad students longitudinally. By administering the instrument cyclically over a period of time, researchers can investigate whether linguistic competence and intercultural competence develop separately or whether these competences are related in development. Such an approach is doable with reliable and valid instruments, trained evaluators, and sufficient amount of time to capture and analyze data collected over time.

2.3 Research needs for understanding the relationship between pre-programmatic linguistic and cognitive abilities and language development while abroad

Some researchers suspect that learners must cross certain pre-programmatic linguistic and cognitive thresholds to benefit fully from study abroad (Segalowitz & Freed 2004; Lafford 2006; Collentine 2009; DeKeyser 2010). In theory, gains in study-abroad learners' lexical, morphological, and syntactic abilities should result from their greater exposure to the L2. Yet, while study abroad consistently leads to fluency gains, grammatical gains are unimpressive for learners who have not attained an advanced level of proficiency. Isabelli et al. show that, even with (presumed) increased exposure to the L2, study-abroad learners tend not to improve in their grammatical accuracy. Accordingly, researchers have raised the question: What are the pre-programmatic factors that predict gains in L2 grammatical abilities (Collentine 2009): contact hours, proficiency level, or some other factor such as cognitive ability? Interestingly,

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while summaries of study-abroad research reason that certain important threshold effects interact with learners' development, this question has not been systematically tested, thus impeding the theory construction process (Eisenhardt & Graebner 2007; Porte & Richards 2012).

Not only does there appear to be a linguistic threshold, but there also seems to be certain cognitive thresholds. Linguistic processing is mediated by cognitive factors, such as world knowledge, phonological and working memory, as well as attentional and perceptual systems (DeKeyser 2009). If a study-abroad speech situation overwhelms these cognitive mechanisms, learners may not participate or pay attention to what is said, and gain little. When real-time communication overburdens cognitive resources, managing multiple levels of linguistic representation (e.g., phonology, morphology, syntax, pragmatics) becomes cumbersome. For study-abroad learners, speed and efficiency in lexical access and attentional control are readiness factors predicting gains in oral proficiency and grammatical accuracy (Segalowitz & Freed 2004; Sunderman & Kroll 2009).

All told then, possible thresholds appear to be linguistic or cognitive in nature. For example, students may need certain ability with the past tense (e.g., morphological, syntactic, pragmatic) for it to grow in incidental contexts. Or, learners may need to be at a point where using the past tense is cognitively manageable in real-time communication where automaticity is necessary.

Research task 3
Test the hypothesis that development abroad exhibits threshold effects due to pre-programmatic abilities

It is possible to investigate threshold effects with a theoretical model that recognizes the interaction between cognitive and linguistic abilities during L2 development, and by designing a study that employs recently developed methods for identifying important developmental factors by which demonstrable gains occur. A researcher studying potential thresholds must identify a theoretical framework whose axioms inform the operationalization of relevant construct(s). If one assumes that linguistic processing results from both linguistic knowledge and cognitive mechanisms, a consideration is skill acquisition theory (Anderson 1993). It makes precise assumptions about how learners process and build L2 knowledge structures. Another theory that makes concrete assumptions about thresholds originates in research on multilingual language acquisition. Clyne (2003) presents a model positing that structures in a non-dominant language such as an L2 are difficult to use if their resting activation level is too low, such that the structure's use requires many attentional resources. It follows that a linguistic knowledge structure must possess a certain degree of automaticity for it to be used or strengthened under spontaneous processing conditions (e.g., speaking with native speakers). The model is also useful because it delineates how processes such as working memory and attention interact with an L2.

Having selected a theoretical perspective, we next identify the linguistic structures and cognitive processes to operationalize and measure. If, for instance, the goal is to measure the use of the past tense orally, the researcher could elicit language samples that require varying processing demands to understand the breadth of the learner's abilities (e.g., spontaneous

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speech, spontaneous writing, planned speech, sentence completion, proficiency interview). The researcher will need to collect data before and after – and perhaps even during – study abroad to assess programmatic effects. For cognitive variables, the investigator must identify laboratory data-collection methods, and measure them before study abroad if pre-programmatic abilities are the focus. The inclusion of a control group permits an assessment of the effects of repeated measures.

There exist many statistical approaches to quantifying threshold effects, which vary in reliability and generalizability. One approach would involve examining correlations between pre-programmatic and post-programmatic scores on linguistic (e.g., past-tense performance scores) and/or cognitive constructs (e.g., working-memory scores). To identify potential threshold effects, learners from various proficiency levels could be studied separately, and thus the researcher could identify the proficiency level(s) associated with meaningful gains. Naturally, the researcher would need to carefully operationalize constructs such as 'proficiency level' and 'meaningful gain', employing theoretically or empirically defensible definitions. Another approach could involve logistic regression. Pre-programmatic scores on linguistic and/or cognitive constructs along with proficiency level can be coupled to derive what amounts to a formula that describes the combination of variables that predict whether a learner experiences gains abroad. Measuring 'gains' would require the researcher to establish an arbitrary cut-off point. The dependent variable in logistic regression is categorical (e.g., the learner did or did not benefit from the program), such that the researcher must operationalize what constitutes a significant 'gain' based on some theoretically defensible metric (e.g., an increase in overall proficiency level). Again, careful attention to the operationalization of independent and dependent variable constructs is crucial. Finally, more sophisticated statistical modeling is possible with software employing piecewise statistical models, such as R's Segmented package (cran.r-project.org/web/packages/segmented/).

2.4 Research needs for understanding the effects of social contact while abroad

Many assume that, since study-abroad learners have almost unlimited access to the L2, they should realize extraordinary linguistic gains. As Isabelli et al. indicate, the assumption that learners have frequent social contact with native speakers abroad is debatable. Thus, this key assumption about the context of L2 learning abroad is ready for testing.

Researchers interested in verifying the unlimited access assumption have sought to measure the amount of time learners use the L2 outside the classroom (Segalowitz & Freed 2004; Taguchi 2008). Study abroad occurs within a social ecosystem, which provides formal (e.g., classroom instruction) and incidental (e.g., host-family interactions) learning opportunities (Isabelli-García 2006). The limited amount of research to date on social networks in study-abroad contexts suggests that learners develop few strong relationships with native speakers (NSs), although this generalization varies according to individual factors (acculturation, identity, motivation, attitudes toward L2; see Isabelli-García 2006) and social factors such as the intensity of a learner's friendships (Dewey, Belnap & Hillstrom 2013) and the proportion of one's close relationships that involve fellow students and/or NSs (Gautier & Chevrot 2015).

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Limiting measurements of access to the L2 to incidental time-on-task ignores important cognitive factors such as one's involvement in a speech situation as well as amount and type of contact with NSs (cf. Isabelli-García 2006; Taguchi 2011; Fernández & Tapia 2016). Time-on-task masks the effects of personal histories and interpersonal relationships (Dewey et. al 2013; Gautier & Chevrot 2015; Isabelli et al., 2018). Additionally, individual psychological and cognitive factors may negate time-on-task effects (Segalowitz & Freed 2004). Studying the quantity, quality and effects of incidental study-abroad time-on-task should be complemented with rigorous qualitative, ethnographic research (Isabelli-García 2006; Kinginger 2009; Coleman 2013; Gautier & Chevrot 2015). Yet, a RELIANCE on small-scale and/or qualitative methods may ultimately leave us with an inadequately tested epistemology of social contact. Recently, while study-abroad research has begun to employ social network analysis (SNA) to complement small-scale mixed-methods analyses of learners' L2 contact (Isabelli-García 2006; Gautier & Chevrot 2015), several academic disciplines have adopted SNA to provide large-scale mixed-methods characterizations of social contact and relationships with metrics that study-abroad research could leverage to investigate whether the study-abroad 'access premise' is tenable.

Research task 4
Measure learners' contact with NSs and incidental exposure to the L2 abroad with SNA

We can assess whether learners abroad experience frequent and quality contact with the L2 by taking advantage of recent advances in modeling social relationships and contacts and in collecting digital data about learners' activities. We first need to identify a theoretical framework that can provide an adequate template from which to study the numerous potential speech situations that learners may encounter. The theory should allow us to operationalize learners' interpersonal connections, characterize their social circles, and measure the diffusion of their social networks. Such an approach has the added advantage of enhancing our contextualization of the various contexts of learning abroad (e.g., a monolingual context such as Brazil, a multilingual context such as an Erasmus institution, English as a second language in the UK or the US).

SLA research has developed or refined various social theories of acquisition, such as Hymes's (1972) functionalist model of communicative competence, van Lier's (2004) Ecology of Language Learning Theory focusing on agency and autonomy, as well as Complexity/Dynamic Systems Theory (Larsen-Freeman 2006), which assumes L2 knowledge construction to be socially and cognitively emergent. Milroy & Gordon (2003) demonstrate how SNA can explain language variation that considers one's sociolinguistic contacts. Generally speaking, SNA complements these approaches by assuming that change results from agents' social relationships. For example, a well-known tenet is the 'strength of weak ties' phenomenon, such that actors obtain more new information from people outside of their immediate social circle, a point which Gautier & Chevrot's (2015) research supports. SNA provides a comprehensive ontology of social interactions to track learner interactions and relationships (McCulloh, Armstrong & Johnson 2013).

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Fundamental SNA concepts are: actors and agency, attributes, directionality, densities and distance. Actors are students and their interlocutors (e.g., host families, strangers, fellow students). Actors have attributes such as power, solidarity, and social role (e.g., mentor, learner, purchaser, buyer). Relationships also have attributes, ranging in strength and directionality. For example, friends may enjoy a reciprocal, frequently interactive relationship. Yet, a host-family member may only talk to rather than talk with a learner (e.g., 'Your breakfast is ready!').

SNA is applied in several research contexts, such as ecology, marketing, economics, and medicine (McCulloh et al. 2013).[2] One can quantify important sources of L2 input for a learner and actors who serve as bridges to other actors, in addition to identifying the type of learner (e.g., based on individual factors, such as age or gender) that has many connections and who is isolated. By employing a combination of basic graph-theory metrics (e.g., betweenness, degree of connectivity, centrality; see McCulloh et al. 2013), it is possible to determine whether a group of learners as a whole experienced much contact with the L2 and/or which types of learners had substantial contact.

The next step is to establish a data-collection process. To date, there are no ready-made SNA instruments for SLA. Development should extrapolate data points from SLA social theories and SNA fundamentals. Collecting data from participants will likely need to occur at various intervals during study abroad. The researcher would do well to corroborate interpretations of survey data with follow-up interviews with learners (see Gautier & Chevrot 2015 and Fernández & Tapia 2016, for example).

Technology can improve reporting rates and reliability. Mobile-phone surveys can be designed such that learners can log their interactions as close to possible to when and where they occurred. Combined with survey data and big-data analysis techniques (i.e., using data-mining software to study structured and unstructured data, such as emails, travel logs, social media posts), we can obtain a comprehensive view of their interactions (Christensen et al. 2011; Dax et al. 2015). As with all study-abroad research, there are obvious ethical concerns to consider, especially as regards tracking learners. Transparency and security in collecting digital data are important considerations (Christensen et al. 2011).

Finally, SNA utilizes software such as R's iGraph (cran.r-project.org/web/packages/igraph/) or Gephi (gephi.org), which has a graphical workflow, to produce standard visualizations (termed 'graphs') of social networks that can objectively depict types of relationships and learner interactions, their direction, and the density of their social networks abroad. These data can be compared to qualitative experiential logs to provide a comprehensive SNA analysis of whether learners had substantial contact with the L2. Researchers interested in inferential statistical analyses may consider Exponential Random Graph Models, such as R's ERGM package (cran.r-project.org/web/packages/ergm/), to provide tools that researchers acquainted with regression analysis would use.

[2] See McCulloh et al. (2013) for a conceptual primer of SNA. Kolaczyk & Csárdi (2014) provide an accessible introduction to R software packages such as iGraph.

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3. Conclusion

As internationalization efforts in educational contexts intensify around the world, the number of students who study outside their home country continues to rise. Correspondingly, more and more researchers are investigating the quality of the study-abroad experience and its impact on L2 learning outcomes. Having recognized the 'study-abroad myths', scholars no longer believe that spending time abroad automatically leads to measurable gains in linguistic and cultural learning. Enormous variations in learners' opportunities for practice, learning outcomes, and individual characteristics revealed in the existing findings point to a complex mix of internal and external factors shaping the study-abroad experience, indicating that study abroad is far from a monolithic construct and needs to be examined at multiple levels (individual and societal). Accordingly, we have more questions than answers about what actually happens in the host environment and what students really gain in a study-abroad program. More importantly, we assert that study-abroad research should EXPLICITLY embark on the path of constructing a theory of development in this context that provides developmental and programmatic guidance for educators and researchers, through the iterative and recursive process of identifying and testing hypotheses gleaned from research, checked by replication. Toward this goal, we have proposed four agendas of future research: (1) explicit focus on the causal relationship between study-abroad experiences and learning outcomes; (2) investigation into intercultural competence as part of study-abroad outcomes; (3) focus on pre-programmatic abilities (both linguistics readiness and cognitive capacities); and (4) use of SNA for investigating social contact while abroad. We have also presented concrete indications about how to carry out a research task corresponding to each proposal. We hope that these research topics and tasks, together with Isabelli-García et al.'s state-of-the-art article, serve as guidelines for future researchers as they explore ever-complex interactions among learners, learning contexts, and learning outcomes.

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