Research Article

From Caterpillar to Butterfly: Story of an Ordinarily Extraordinary Generation Z L2 Student Abroad

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Abstract

This longitudinal mixed-methods case study aimed to explain why a seemingly ordinary U.S.-affiliated hyper-connected French language learner (Nancy) achieved extraordinary outcomes after 15 weeks in Paris, compared to fifteen Generation Z peers also enrolled in the program. Framed by Complex Dynamic Systems Theory and social pedagogies, the study adopted a retrodictive approach to "explain after by before" and retrace Nancy's complex, non-linear trajectories of success. Adapting to new realities of students going abroad with their smartphones in hand, multiple measures of success (linguistic, intercultural, social, psychological, emotional) were triangulated with reports on smartphone usage, rich interviews, and background data to provide dense time-series and narrative illustrations of changes. Findings revealed the importance of the activation of Nancy's agency to take advantage of the affordances of her study abroad environment through the butterfly effect arising from her initial conditions, judicious smartphone usage, and quality of L1 and L2 interactions.

Abstract in French

Cette étude de cas mixte longitudinale visait à expliquer les raisons pour lesquelles une apprenante du français langue étrangère ultra-connectée surnommée Nancy, affiliée à une institution universitaire états-unienne, est parvenue à des résultats d'apprentissage extraordinaires après un programme d'études à l'étranger de 15 semaines à Paris, par comparaison avec les quinze autres étudiant.e.s de la Génération Z qui étaient inscrit.e.s

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dans le même programme. Structurée par la Théorie des Systèmes Dynamiques Complexes ainsi que par les modèles de pédagogies sociales, cette étude a adopté une approche rétrodictive dans le but d'expliquer l'après par l'avant et de retracer ainsi les trajectoires complexes et non-linéaires ayant mené au succès de Nancy. En s'adaptant aux nouvelles réalités des étudiants qui partent à l'étranger smartphone en main, de multiples mesures de succès (linguistiques, interculturelles, sociales, psychologiques, émotionnelles) ont été triangulées avec des rapports d'utilisation du smartphone, de riches entretiens, ainsi que des données sur les origines des étudiant.e.s pour obtenir des sériographies temporelles et des illustrations narratives denses des changements encourus. Les résultats indiquent que le fait que Nancy ait activé son agentivité pour tirer profit des moyens que lui procurait son environnement d'apprentissage par le biais d'un effet papillon survenant de ses conditions initiales propres, de son usage judicieux du smartphone et de la qualité de ses interactions en langue première et langue seconde s'est révélé crucial.

Keywords:

1. Introduction

> Residence abroad is (...) located in time, [within] societies that have evolved hugely, not least as regards (...) communication technology which impact[s] the degree of immersion experienced. [With] th[e] 'digital first' generation, for whom 'always-on connectivity' is the norm, social and technological changes [mean that] 'abroad' today is not the 'abroad' of even five or ten years ago (Coleman, 2015, p. 37).

With the rise in ubiquitous mobile technology that allows a new generation of L2 learners – Generation Z – to maintain contact with everyone everywhere all at once, the long-standing myth of immersion during SA has shattered (Durbidge, 2019; Hofer et al., 2016; Kinginger, 2019), sparking a need for renewed approaches to SA research that fully account for smartphone usage and acknowledge the limited relevance of previous findings to understand contemporary SA experiences (Howard, 2019; Kinginger, 2019). Indeed, although the types and quality of students' social relationships abroad are instrumental in fostering successful SA outcomes (Gautier, 2019), reports so far have largely been restricted to face-to-face, on-site networks, omitting the online socialization students engage in both with those around them and those physically absent, such as loved ones at home. Moreover, smartphone usage is not restricted to interpersonal

communication but also entails access to audiovisual media (e.g., *YouTube*), productivity tools (e.g., *Gmail*), navigation instruments (e.g., *Maps*), etc. – all of which may impact the SA experience (Kashiwa, 2022; Mroz & Thrasher, 2022). Scholars have mostly assumed that this hyper-connectivity is detrimental to students' SA success by tethering them to their home language and culture, limiting engagement and socialization in the target language and culture (Allen & Dupuy, 2013; Compiegne, 2021; Hofer et al., 2016; Iwasaki, 2019; Zimmerman, 2020). However, this assumption deserves further scrutiny, as smartphones might in some ways play a beneficial role as mediators in students' learning (Mroz, in press).

To add to this technological turn, a methodological turn is also needed. Indeed, recent syntheses show that empirical approaches to research on language learners abroad have made limited contributions to the field, struggling to determine the impact of isolated variables on success abroad due to large individual variations (Isabelli-García et al., 2018; Kinginger, 2019; Mitchell, 2023). Rather than consider them as noise, scholars urge focusing on these individual differences, championing process-oriented mixed methods studies aimed at determining why "certain students thrive while others founder" (Kinginger, 2011, p. 58). The goal is to recognize the immense variety and complexity of individual SA experiences to document individual trajectories of success (Coleman, 2013b) in terms of linguistic, intercultural, social, emotional, and psychological gains. Adopting a novel approach to "researching whole people and whole lives" in SA (Coleman, 2013a, p. 17), this longitudinal case study aimed to document the factors that appeared to lead a seemingly ordinary hyper-connected, Generation Z student – Nancy (pseudonymized) – to undergo extraordinary multifaceted success during SA, compared to other students in the same program. Implications and recommendations for SA students and programs ensue.

2. Literature Review

2.1. Framework

This study was framed using Complex Dynamic Systems Theory (CDST) and social pedagogies. CDST focuses on *individual* trajectories of language learning changes over time (de Bot, 2008), arguing that similar learning procedures lead to divergent, non-linear patterns of development across learners (de Bot et al., 2007). It seeks particularizability over generalizability (Larsen-Freeman, 2017) and embraces complexity by producing *retrodictions*, i.e., by "explaining after by before" (de Bot & Larsen-Freeman, 2011, pp. 19-20). Acknowledging both quantitative and qualitative aspects of change (Larsen-Freeman, 2017), it champions a mixed methods approach to longitudinal case studies

aimed at retracing the signature dynamics of a subject (Dörnyei, 2014) by triangulating data into dense time series (Lowie, 2017). By combining "the investigation of process, meaning, and context" – i.e., by simultaneously providing a "description of a visualizable sequence of events", capturing "people's beliefs, values, [and] understandings", and "identifying the relevant features of the setting" (Maxwell, 2019, pp. 7-10) that "produced the outcomes we want to understand" (Becker, 2009, p. 550), it makes it possible to establish local causal explanations rather than definitive causality.

CDST investigates forces like (a) the butterfly effect, (b) complete interconnectedness, and (c) human agency (de Bot et al., 2007). The butterfly effect acknowledges that changes are influenced by initial conditions and that, because changes are non-linear, "any minor differences at the beginning may have dramatic consequences in the long run" (de Bot et al., 2007, p. 8). Complete interconnectedness entails recognizing that individuals' changes are associated with a multitude of objects and people who mediate their development and are spatiotemporally dependent (Larsen-Freeman, 2017). Finally, human agency is the way individuals consciously exercise independent choices and intentional, purposeful, and meaningful actions to enact changes in themselves and their environment, even when it is unfamiliar (Antopolskaya et al., 2020; Hiver & Al-Hoorie, 2016; Raby et al., 2021; Ye & Edwards, 2017). Agency is considered the primary force behind divergent developments between individuals exposed to similar learning procedures in SA (Coleman, 2015; Covert, 2014; Du & Jackson, 2021: Fernández et al., 2021; Isabelli-García et al., 2018; Iwasaki, 2019; Kashiwa, 2022; Larsen-Freeman, 2017; Mitchell, 2023). This study of agency takes its roots in five decades of theories on the impact of psychosocial factors on linguistic achievement abroad. Inspired by such theories as Schumann's (1986) acculturation and Gardner and Lambert's (1959) theory of integrative vs. instrumental motivation, the selection of agency as a focal construct makes it possible to overcome some well-documented limitations of these influential models, by (a) accounting for individual differences in learning outcomes rather than dealing with cultural groups (Bluestone, 2009; Zaker, 2016), (b) being readily definable, operationalizable, and thus observable and measurable (Farhady, 1981), (c) focusing on the *quality* of the contacts learners experience with different speakers (Ellis, 2008) and thus portraying micro-levels of their personal social network (Bluestone, 2009). In investigating Nancy's growth, this study uncovered the butterfly effect arising from her initial conditions, the interconnectedness of people and objects – including her smartphone – that she associated with at different moments in different spaces, and the ways in which her agency manifested to enact changes.

This CDST framework was combined with social pedagogies, which consider that learning is a socially-situated endeavor that occurs beyond the classroom, in the "complex intercultural, transactional, and ideational" interactions occurring with, of, and for the communities with which learners associate (Dubreil & Thorne, 2017, p. 2). Social pedagogies champion valuing the learning process by engaging with difficulty and complexity with authentic audiences to participate in intellectual communities and connect emotionally and cognitively. These pedagogical opportunities may lead to more profound, meaningful, transformative, and long-lasting learning (Figure 1) (Bass & Elmendorf, 2018). This study used social pedagogies to guide the analysis of Nancy's changes, notably by identifying the idiosyncratic repertoire of social practices that made her learning so successful (Dubreil & Thorne, 2017).
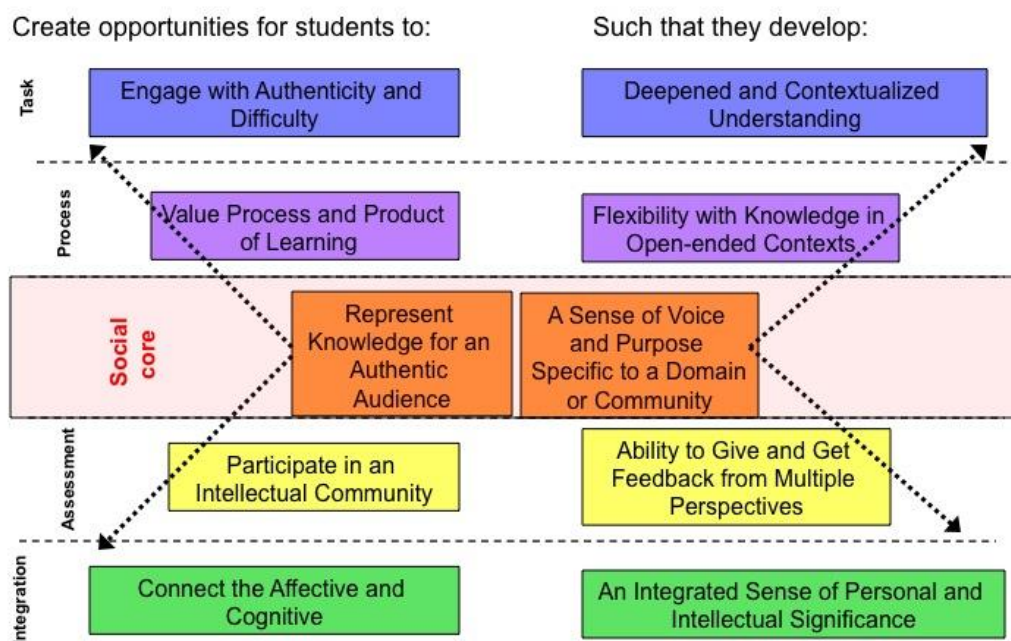
Social Pedagogies: Design Elements & Goals

FIGURE (1): SOCIAL PEDAGOGIES (BASS & ELMENDROF, 2018 – REPRODUCED WITH THE AUTHORS' PERMISSION)

Research following similar theories has recently focused on debunking the myth that SA is an inherently life-changing experience, rather explaining that SA has transformational *affordances* that only turn into transformational forces (Bain & Yaklin, 2017; Mitchell, 2023) when (a) SA programs are based on strategic tasks like observations (Lomicka & Ducate, 2021), reflections (Fukuda & Nishikawa Chávez, 2021; Savicki & Price, 2017), or socialization (Mroz & Gorham, 2023), and (b) students challenge themselves to engage in and with the target language and culture (Antopolskaya et al., 2020). This study

investigated an SA program strategically designed to offer a strong experiential learning component and documented students' engagement with different communities (Coleman, 2015).

2.2. Success in SA

Language and culture have historically been central in evaluating success in SA. Yet, since this study aimed at "researching whole people and whole lives" (Coleman, 2013a), it also included social, psychological, emotional, and technological aspects.

2.2.1. Language

This study evaluated socially-bound aspects of oral quality in the target language (L2): intelligibility, fluency, and proficiency. Intelligibility is "the extent to which a [learner]'s message is actually understood by a listener" (Munro & Derwing, 1995, p. 76), i.e., the degree of similarity in verbatim transcription between one's utterance and the originally intended text (Thomson, 2018). To date, only Lu (2015) has examined intelligibility gains in L2 students abroad and established that gains were significantly associated with time spent in the L2 hanging out with friends, talking on the phone, and attending lectures.

Fluency corresponds to the perceived rhythmic quality of speech (Freed et al., 2004; Hardison, 2014; Tavakoli & Skehan, 2005). Comparing an SA program with an intensive at-home program, Freed et al. (2004) determined that the amount of L2 use and practice mattered more than location for fluency gains. Vercellotti (2017) and Sauer (2020) established that fluency increased during SA and that, conversely, long pauses were negatively associated with repetitions, grammatical complexity, lexical variety, and accuracy. Furthering this trend, this study operationalized fluency in terms of speech rate and mean length of run (Mitchell et al., 2017), to take into consideration both progress and breakdowns in fluency.

Finally, proficiency corresponds to "the ability to use language in real-world situations in spontaneous interaction and non-rehearsed context[s] in a manner acceptable and appropriate to native speakers of the language" (LTI, 2012, p. 34). Research on proficiency development during SA remains inconclusive. Some studies have unconvincingly assimilated proficiency to placement scores (Gilyuk et al., 2021; Vercellotti, 2017). Others have used elicited imitation tasks, but while Mitchell et al. (2017) reported significant growth, García-Amaya (2022) did not. Mroz and Thrasher (2022) used Oral Proficiency Interviews (OPIs) combined with self-assessed Can-Do statements (ACTFL, 2012) and found that each student had their own, often nonlinear proficiency trajectories. This study adopted a similar combination of OPIs and Can-Do statements to track proficiency.

2.2.2. Culture

Research indicates that intercultural development in SA is mediated by numerous factors, including program length and pedagogical characteristics (Schartner, 2016; Shiri, 2015), quality and quantity of engagement in the target culture and language (Moreno Bruna & Goethals, 2020; Schwieter et al., 2018), and cultural background (Nguyen et al., 2018). It is also associated with increases in acceptance of diversity, emotional resilience, flexibility, openness (Fong, 2020), apprehension, confusion, excitement, and enlightenment (Beaven & Spencer-Oatey, 2016). This study considered all of these variables in evaluating two complementary aspects of interculturality: multicultural personality (van der Zee et al., 2013) – identity factors related to attitude and personality, such as adaptability and flexibility – and intercultural effectiveness (Portalla & Chen, 2010) – one's behavioral ability to effectively interact and communicate with others from different cultures.

2.2.3. Social Engagement

Calling for more research on social engagement in SA, Duff (2019) recommended investigating "what social networks and practices learners are embedded in and which languages mediate their relationships and interactions" to determine how growth is supported (p. 14). Studies have concurred that quality of social interactions matters more than quantity in predicting language gains (Arvidsson, 2019; Baker-Smemoe et al., 2014; Baten, 2020; Bejarano et al., 2019; Gaugler & Matheus, 2019; McManus, 2019; Mitchell et al, 2017; Tullock & Ortega, 2017) and intercultural growth (Alonso-Marks & Sánchez Hernández, 2020; Baker-Smemoe et al., 2014; Mitchell et al., 2017). Considerable imbalance between contacts with locals (rare) and co-nationals (unavoidable) has also been found (Compiegne, 2021; Mas-Alcolea & Torres-Purroy, 2022; Seibert Hanson & Dracos, 2019), attributable to program structure, with SA students often taking classes among themselves, forming "self-contained enclaves" (Mas-Alcolea & Torres-Purroy, 2022, p. 13). Finally, homestay has emerged as the biggest social contributor to language development (Gautier, 2019; Kinginger, 2019; Mroz, in press; Mroz & Thrasher, 2022; Seibert Hanson & Dracos, 2019), despite apprehensions that "changes in the middle-class family as a form of social order" might put an end to the tradition of rich dinner table conversations (Kinginger, 2019, p. 265).

Two studies have been particularly influential in assessing social networks. First, Gautier (2019) mapped out the social networks of 29 Chinese and American learners of French according to four types of interlocutors: originals (those living in the learner's home country), hosts, national peers (living in France), and transnationals. Results revealed that different networks were associated with diverse cultural backgrounds,

housing selection abroad, and quantity of L1 vs. L2 used. Comparatively, Mroz (in press) aimed to determine whether keeping in touch with loved ones impeded progress abroad, using a social index based on the language of communication, location of members of the social network, length and strength of interactions, and modes of communication. Results indicated that participants who displayed more attachment to their loved ones at home also engaged more in the target language abroad and made substantial gains in interculturality. The current study adopted Mroz's (in press) social index calculation to map out the evolution of Nancy's social network and assess its impact on her success.

2.2.4. Mobile Technology

Current L2 learners abroad are hyper-connected. 96% of 18-25-year-old Americans own a smartphone (Pew Research Center, 2021) and use it to mediate virtually all facets of their lives (Seemiller & Grace, 2019). Immersed in an economy of attention in which everything is competing for their awareness (Patino, 2019), more than half of Gen Zers reported feeling addicted to their phones (Common Sense Media, 2016; Twenge, 2017). Phone affinity has thus become a topic of interest in medical and public health research with mixed findings; although phones can be detrimental when used excessively, they can also be beneficial for health monitoring (Bock et al., 2016). Similarly, SA research now questions whether smartphones impede SA success. Guichon (2015) showed that social media can be useful to support integration into the host culture to prepare students for the sojourn and to maintain important relationships during SA. Shao and Crook (2015) found that shared blogging on smartphones allowed L2 learners to reflect on their SA experiences. Lomicka and Ducate (2021) and Guerrero-Rodríguez et al. (2021) determined that phone geolocation could help learners notice the host culture and gain intercultural awareness. Finally, Mroz (in press) established that learners who mostly used their phones to communicate with loved ones at home and to navigate the host culture also interacted more in the target language and made sizable gains in interculturality, compared to those who mostly used their phones to consume audiovisual media. Thus informed, this study investigated the influence of phone usage and affinity on Nancy's success.

2.2.5. Generation Z's Psychological and Emotional Traits

Generation Z has also been described in terms of several demographic, psychological, and emotional traits worth tracking to assess SA success. Fear of missing out directly relates to hyper-connectivity, with 75% of adolescents feeling compelled to answer their phone immediately (Common Sense Media, 2016) and 33% feeling left out (Twenge 2017). Generation Z is also the most anxious generation to date, with 60% of undergraduate students reporting overwhelming anxiety (Seemiller & Grace, 2019;

Twenge, 2017). This study focused on social interaction anxiety, language anxiety, and loneliness, since Gen Zers' anxiety has been shown to correlate with heightened feelings of loneliness (Cigna, 2018), particularly in female students (SAMHSA, 2020). Conversely, more positive traits of Gen Z could be instrumental for SA success, notably their increased linguistic and ethnic diversity compared to previous generations (Vespa et al., 2018) and their greater propensity for openness, tenacity, care for others (Seemiller & Grace, 2019) and possibly for language enjoyment (Dewaele & McIntyre, 2014). They are also more prone to sensation seeking and may have better control over their emotions through a wider palette of emotional regulation strategies (Gross & John, 2003). In accordance with this study's whole-person approach, all of these demographic, psychological, and emotional aspects were included in evaluating Nancy's success.

Psychology as a field of study has in fact been highlighted for its promising compatibility with SA success. Goldstein (2017) argued that pre-departure training in recognizing well-known psychological phenomena associated with SA (e.g., culture shock, stereotyping) can provide learners with an efficient framework to adjust to unfamiliar situations. Earnest et al. (2016) established that the combination of psychology courses and a SA experience resulted in "greater emotional resilience, perceptual acuity, and cultural adjustment" than domestic psychology courses alone (p. 75). Accordingly, this study investigated whether Nancy's prior training in psychology contributed to her outcome.

2.3. Influential Approaches

Two research approaches were particularly influential for this study: (a) interconnected studies investigating multiple learning outcomes in SA cohorts and (b) case studies documenting individual trajectories – all of which adopted the type of qualitatively based local causal explanations from triangulated datasets championed in this study.

Adopting an interconnected approach, Hardison (2014) showed that a 6-week-long program led to significant improvements in L2 use, pronunciation, fluency, accentedness, vocabulary, grammar, cross-cultural interest, and adaptability. Mitchell et al. (2017) found that post-SA significant increases in proficiency, fluency, and complexity were associated with goals to become more competent L2 speakers but with only surface-level changes in intercultural skills. Finally, Mroz and Gorham (2023) determined that the initial significant relationships between intelligibility, fluency, and proficiency pre-SA not only strengthened during SA, but also changed – from being negatively linked to language anxiety at first, to ending up positively correlated to gains in intercultural effectiveness.

Adopting a case-study approach, Allen (2010) focused on relational dimensions, comparing two typical American learners of French's perceptions of their SA environment to determine how those informed the evolution of their learning goals and outcomes. Although both were confronted with communicative challenges and wavering motivation, whereas Molly was intentional in adapting her strategies to meet her language goals, resulting in a successful language trajectory and a decision to stay in France through the TAPIF (Teaching Assistant Program in France) program, Rachel's lack of explicit language goals and agency led her to revert to her comfort zone and feel dissatisfied with her progress. Focusing on the role of agency, Du and Jackson (2021) similarly portrayed two Chinese learners in Canada with divergent trajectories: Gary exhibited high levels of agency and had a gratifying experience whereas Maggie had little agency and ended up feeling lonely and socially excluded. Likewise, in Jackson's (2019) case study on affective variables, Zoe – an English learner from Hong Kong – displayed a trajectory of missed opportunities to activate affordances in the SA environment. Despite previous experience in bilingual education and an anthropology major she thought would give her an edge, her initial lack of explicit language goals and overestimation of her intercultural competence soon made her feel insecure in her abilities in unpredictable situations, leading her to turn to other international students on site and her loved ones online for her social and emotional needs. Conversely, Mitchell and Tracy-Ventura (2021) portrayed two very successful British learners of French and Spanish. Compared to their respective cohort, and despite maintaining important relationships in their L1 (online with their family and loved ones and onsite with co-nationals), Joyce and Stephen displayed high gains in oral skills and altered their plans for the future to stay abroad one more year. Both demonstrated considerable agency, self-awareness, and reflections. For instance, having chosen to complete an internship at a library's help desk, Joyce repeatedly practiced variations of the same complex task, namely, talking people through solving their issues in the L2.

Inspired by these two trends and following both an interconnected and a case-study approach, this study compared multiple learning trajectories of an outstanding gainer to the cohort of SA students she belonged to.

3. Methods

This study addressed the following questions:
1. Compared to her peers, how did Nancy's SA outcomes stand out?
2. To what extent were Nancy's initial conditions ordinary/extraordinary?
3. How might Nancy's SA experience explain her achievement?
4. What aspects of Nancy's outcome were less successfully impacted by SA?

3.1. Context and Participants

This study emerged from a larger work following 16 undergraduate L2 French learners from two U.S. universities (one Midwestern and one Southeastern) studying abroad in Paris between 2019-2021 (Mroz, in press). The SA program was designed for US students and focused on linguistic, intercultural, and personal development through eight weekly hours of language and cultural classes designed to take advantage of Paris as a learning environment (e.g., exploring Paris for *Migrations, Neighborhoods, and Communities in 19th- and 20th-century Paris*), as well as three weekly hours of experiential learning through volunteering with local nonprofits or schools. Thirteen women and three men participated, nine from the Midwestern and seven from the Southeastern institution. Six participants stayed eight weeks, eight 14 weeks, and two 32 weeks. All belonged to Generation Z (average age = 20.56). Nine had chosen a homestay and seven a *foyer* option. All but one were native English speakers. Eight were French majors, three French minors, and five non-degree seekers. Seven were initially Intermediate-Mid speakers of French, six Intermediate-High, two Advanced-Low, and one Advanced-Mid speaker.

3.2. Data Collection

The study followed a microgenetic case study approach (Luwel, 2012), i.e., aiming to collect detailed data about changes across several domains as they occurred by repeating measures and observations over the entire period to obtain dense datasets that were then intensely analyzed at the individual level to "give rise to both quantitative and qualitative aspects of change" (p. 1). A summary of all domains and variables elicited is presented in Figure (2) on the next page.
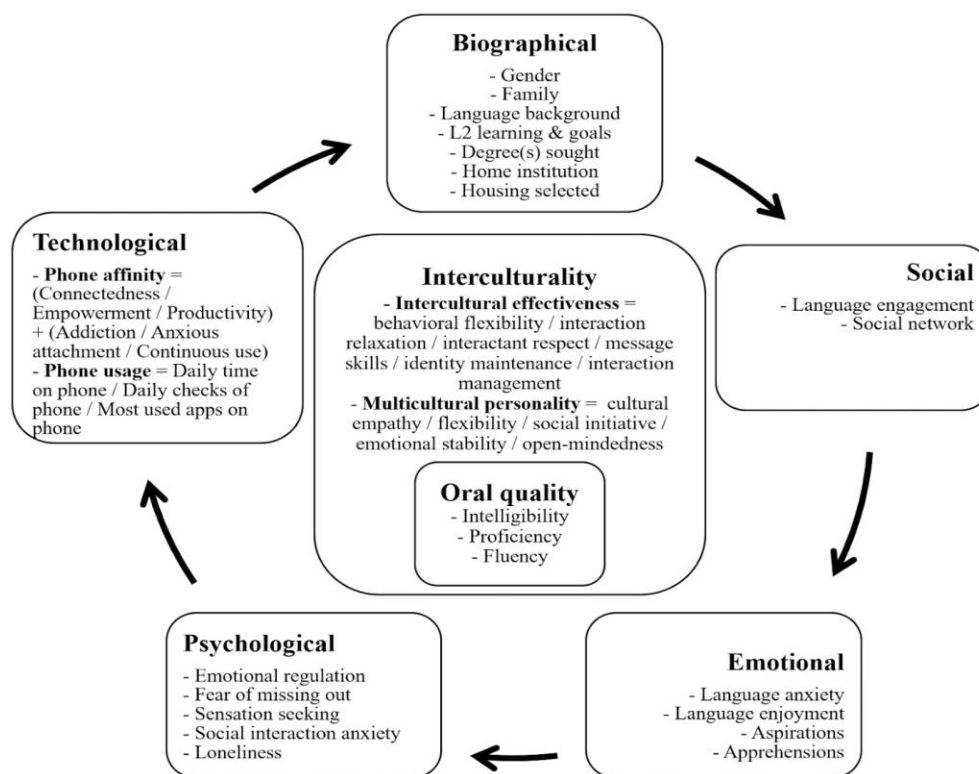
FIGURE (2): SUMMARY OF VARIABLES

3.2.1. Pre- and Post-SA

Before and after SA, participants completed a: (a) linguistic/demographic background questionnaire (pre-SA only); (b) language engagement questionnaire estimating hours/day and days/week spent using French vs. any other language for specific interpersonal tasks; (c) five-point Likert scale language anxiety (Horwitz et al., 1986) and enjoyment (Dewaele and MacIntyre, 2014) questionnaire; (d) five-point Likert scale interculturality questionnaire assessing intercultural effectiveness (Portalla & Chen, 2010) – composed of behavioral flexibility, interaction relaxation, interactant respect, message skills, identity maintenance, and interaction management – and multicultural personality – including cultural empathy, flexibility, social initiative, emotional stability, and open mindedness (van der Zee, et al., 2013); (e) five-point Likert scale Gen Z psychosocial questionnaire measuring fear of missing out (Przybylski et al., 2013), emotional regulation (Gross & John, 2003), sensation seeking (Stephenson et al., 2003), loneliness (Russell et al., 1978), and social interaction anxiety (de Beurs et al., 2014); (f) five-point Likert scale phone affinity questionnaire examining negative (smartphone addiction, anxious attachment, and perceived continuous use) and positive (connectedness, empowerment, and productivity) aspects of phone usage (Bock et al., 2016); (g) social network questionnaire listing frequency, mode (online vs. offline), and

language of interactions (French vs. other) with *regular* contacts (adapted from McManus et al., 2014); (h) unrehearsed, audio-recorded, 110-word-long French read-aloud task; (i) 20-30-minute audio-recorded French Oral Proficiency Interview (OPI) with a certified tester; (j) 214 Can-Do statements self-evaluating proficiency on each level of ACTFL's 2012 guidelines (ACTFL, 2015); and (k) 10-20-minute audio-recorded semi-structured interview discussing expectations, goals, and apprehensions before SA, and retrospective evaluations and opinions after SA .

3.2.2. During SA

During SA, participants submitted weekly reports from *Space,* an application tracking the amount of time spent on their phone, number of unlocks of their phone, and six most used applications. They also completed weekly shortened Can-Do questionnaires, including items from their initial proficiency level and the levels immediately above and below. Additionally, every four weeks, participants repeated language engagement, interculturality, and social network questionnaires. Halfway through SA, they also completed a 10-20-minute audio-recorded semi-structured interview discussing their SA experiences.

3.3. Analysis

Following Dörnyei (2014), data were integrated into a Retrodictive Qualitative Model (RQM) involving three steps, to which a fourth one was added to follow Maxwell's (2019) theory of causality. The steps were: (1) identifying a salient portrait of remarkable changes that becomes the case under study; (2) identifying principal factors involved in the dynamic process; and (3) "[retrospectively] describ[ing] the trajectory of the learner development that culminated in their particular outcomes" (Dörnyei. 2014, p. 88), (4) with a purpose to merge data simultaneously eliciting process, meaning, and context to establish local causal explanations. All data were first rated, coded, and mapped out to establish whether and how each participant had undergone changes on all selected domains of interest.

3.3.1. Quantitative Ratings and Mappings

Oral quality entailed intelligibility, proficiency, and fluency[1]. First, pre- and post-SA intelligibility scores were established using read-alouds and applying Mroz's (2020) confirmatory verbatim transcription protocol. Second, pre- and post-proficiency scores were determined by certified testers using OPIs and ACTFL's 2012 guidelines. Moreover, the proportion of "Yes, I can" responses on weekly Can-Do questionnaires were tabulated

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[1] Ratings were handled independently by multiple raters and considered highly reliable, with all intraclass correlation rates gauging inter- and intra-rater reliability above .874.

for each proficiency level. Trajectories of change in self-evaluated proficiency throughout SA were mapped out as time-series, with SPSS curve estimation regression to smooth the data and estimate the best-fitting curve (Verspoor & van Dijk, 2011). Third, OPIs also served to determine fluency, operationalized as speech rate and mean length of run, respectively calculated as the average number of syllables produced in 5 seconds and "the average number of syllables [produced] between silent pauses [or fillers ≥] 0.25 seconds" (Mitchell et al., 2017, p. 68).

Furthermore, the social aspects of language use involved assessing language engagement and social networks. Scores from the language engagement questionnaire were tallied and averaged to compare how much French vs. other languages was employed before vs. throughout SA. Moreover, using Mroz's (in press) social network index, pre-, post-, and during-SA social network questionnaires were used to map out, as stacked column histograms, the monthly evolution of the proportion of each student's self-reported social network dedicated to interactions in French vs. in other languages – with loved ones at home vs. with any other people (e.g., co-nationals on site) (Baker-Smemoe et al., 2014; Tullock & Ortega, 2017).

Next, cultural, psychological, and emotional changes were evaluated. First, the pre-, post- and during-SA interculturality questionnaires were scored using Portalla and Chen's (2010) and van der Zee, et al.'s (2013) protocol to assess evolutions in intercultural effectiveness and multicultural personality, with trajectories of change mapped as line histograms. Similarly, pre- and post-SA language anxiety vs. enjoyment and Gen Z questionnaires were scored using their respective scoring systems to determine whether there were any changes in the psycholinguistic and psychosocial characteristics of Gen Z learners.

Phone usage was evaluated in two ways. First, *Space* reports were used to calculate overall average daily time spent on phone and phone unlocks and to track trajectories of change during SA. Moreover, after listing all applications encountered in the phone reports, two raters created categories by type – communication (e.g., *WhatsApp*), social networking (e.g., *TikTok*), gaming (e.g., *Candy Crush*), audiovisual (e.g., *Netflix*), geolocation/travel (e.g., *Maps*), internet search (e.g., *Safari*), learning (e.g., *Duolingo*), and productivity (*e.g., Google Drive*) – and each participant's types of phone use were scored based on the top six most-used applications reported. Second, pre- and post-SA phone affinity questionnaires were scored using Bock et al. (2016) to compare the evolution of different aspects of positive vs. negative phone usage.

3.3.2. Qualitative Coding

Qualitative data – the initial background questionnaire and three semi-structured interviews – were transcribed verbatim and coded thematically à la Mitchell and Tracy-Ventura (2021). Complementing the constructs elicited in the quantitative datasets, these dense descriptive, narrative, and experiential accounts helped reconstruct each participant's initial conditions and identify whether and how they displayed social pedagogies, i.e., whether and how they established an authentic audience, connections, intellectual community, self-reflection, and agency (Bass & Elmendorf, 2018; Lomicka & Ducate, 2021) (Figure 1).

3.3.3. Case Study Selection and Causal Explanations

This study ensued from a larger project with different research goals. However, various data analyses led to the emergence of one participant who, in many ways, behaved as a statistical outlier. To confirm whether this participant was indeed consistently salient, Larsen-Freeman's (2017) criteria were used to examine all data in search of radical changes, i.e., quantitative variations by one or more standard deviations from the group's mean, and drastic qualitative variations from initial conditions. Group means and standard deviations were calculated on all quantitative variables and subsequently compared to individual students' initial and final means, as well as average changes, and thematic codings of qualitative data were compared and contrasted across time.

It was confirmed that Nancy, a 21-year-old, female, L1 English-speaker from the Midwestern institution was the participant with the most remarkable outcomes and changes in (1) oral quality, (2) language engagement, (3) social network, (4) open-mindedness, and (5) self-identification with French (RQ1). Reasons why Nancy was so successful in these domains were retrodictively traced back to both her initial conditions (RQ2) and her SA experiences (RQ3). Finally, less successful changes in other domains were assessed (RQ4) to avoid reducing Nancy's case to simplistic representations. Causal explanations of Nancy's success were established following Maxwell's (2019) theory of causality in qualitative and mixed methods research, i.e., through a confirmatory triangulation of data reflecting the sequentiality of her successful *process* (via the repeated measures on the multiple variables investigated), the *meaning* she attributed to this success (primarily in her interviews), and the *context* within which this success unfolded (via rich descriptions of the SA setting).

4. Findings

4.1. RQ1 - Nancy's Outcomes and Progress

Nancy's outcome and progress are presented in Table (1) on the next page. Percentages reported reflect changes in percentage points. First, compared to the group, Nancy demonstrated exceptional development of oral skills, as the only participant whose proficiency grew by two levels – from Intermediate-Mid to Advanced-Low. Moreover, her intelligibility rate increased by 6.37%, her speech rate by 3.86 more syllables produced every 5 seconds, and her mean length of run by 6.85 more syllables produced before a pause, ending at 12.18.

Second, her language engagement in French resulted in a score of 2.733, indicating that she was closer to engaging in various interpersonal tasks in French *several times* weekly rather than just *a few times*. The gap between her engagement in French vs. other languages resulted in a score of .400 compared to -.361 in the cohort, indicating that she conducted more tasks in French than in other languages. Third, Nancy differed drastically from the group in the proportion of her network relying on French interactions (42.16%), which increased by 37.44% during SA. Conversely, the proportion of her network relying on interactions in other languages with people other than her family or friends back home only represented 25.97%. Fourth, Nancy's multicultural personality changed with a spectacular increase of .500 in open-mindedness, compared to a general *decrease* in the group. Finally, Nancy was one of only two students who substantially altered their immediate future to give French a prominent role. Indeed, she decided to remain in France and joined TAPIF in Orléans. She determined:

> Although Fulbright is more prestigious, I'd still rather be in France for my language level. If I was in Laos next year, that's not going to help my French at all. It'd be really cool, but they don't speak French there, so I decided I really wanted to keep working on my French, so that's why I decided on TAPIF. (post-interview)

		Outcomes			Changes		
		Nancy	**Group**		**Nancy**	**Group**	
		M	**M**	**SD**	**M**	**M**	**SD**
Oral quality	Proficiency (5=Int-High/6=Adv-Low)	6	5.38	.885	**2**	.50	.632
	Intelligibility (%)	93.64	91.31	4.333	**6.37**	2.41	3.856
	Speech rate (syll/5s)	14.57	12.66	2.623	**3.86**	1.49	1.881
	Mean length of run (syll before pause)	**12.18**	8.04	3.142	**6.85**	.74	2.809
Language engagement	Engagement in French (/4)	**2.733**	2.028	.614	1.466	1.490	.581
	Gap in engagement (French – any other language) (|/4|)	**.400**	-.361	.557	2.267	1.875	.663

Social network	In French (%)	**42.16**	19.30	17.912	**37.44**	16.12	17.657
	In any other language with people other than family and friends back home (%)	**25.97**	57.60	30.586	8.46	36.66	27.276
Multicultural personality	Open-mindedness (/5)	3.625	3.367	.901	**.500**	-.281	.705

TABLE (1): OUTCOME AND PROGRESS

4.2. RQ2 - Nancy's Initial Conditions

Before SA, Nancy had learned French in classroom settings (in high school, she initially "honestly hated it [because she] had a horrible teacher" but later "had phenomenal teachers and started to really love the language" (pre-interview), but also watched French movies and used French on social media. She did not have prior bilingual education or other immersive experience in French.

At the onset of the study, Nancy was affiliated with a large public institution of higher education in the American Midwest. She stood out academically with three majors: clinical psychology, French, and global studies. She had already taken several advanced French courses and was, for the most part, a self-reported straight-A student, similarly to most of her peers in the program (background questionnaire). Her choice to study abroad had been motivated by "[growing] up hearing stories about her [mother's] awesome tales across Europe" (pre-interview). Her main goals were to "become fully fluent", to "be able to navigate Paris", and to "visit the historical sites that [she had] learned about in class". She was most apprehensive about "being viewed as a dumb/slobby American", "getting lost", and "making friends" (background questionnaire). Like many in the group, she anticipated keeping in touch with her loved ones – particularly her romantic partner – via *WhatsApp*. She had selected the homestay option, like eight other participants, for its central location and to improve conversational skills in French.

In the weeks before departure, one of the ways Nancy differed from her peers was how much more engaged she was with interpersonal tasks in French, interacting on social media and sending text messages. However, initial tests of her oral skills established that she was in the lower bracket of the group with Intermediate-Mid proficiency – i.e., a lower level (4) than most in the group (4.88). Her intelligibility rate was 87.27% and was similar to her peers' (88.89%). She was able to produce 10.71 syllables every 5 seconds, quite similarly to her peers (11.17). Finally, she was only able to produce 5.33 syllables between pauses, compared to 7.30 on average in the group.

Culturally speaking, Nancy anticipated an initial sense of "uneasiness" with the novelty of her environment that she tied to the need to "pay attention", particularly to where she was going to be going, foreseeing having to rely on *Maps* a lot (pre-interview). She displayed a multicultural personality score of 17.75 out of 25 and an intercultural effectiveness score of 22.90 out of 30 that, overall, did not differ substantially from the group's averages (respectively 16.84 and 21.63), except for her superior interactant respect (i.e., showing respect to one's counterpart in intercultural interaction) and message skills (i.e., understanding, distinguishing, and executing the messages during an intercultural interaction, as well as responding appropriately) (Portalla & Chen, 2010).
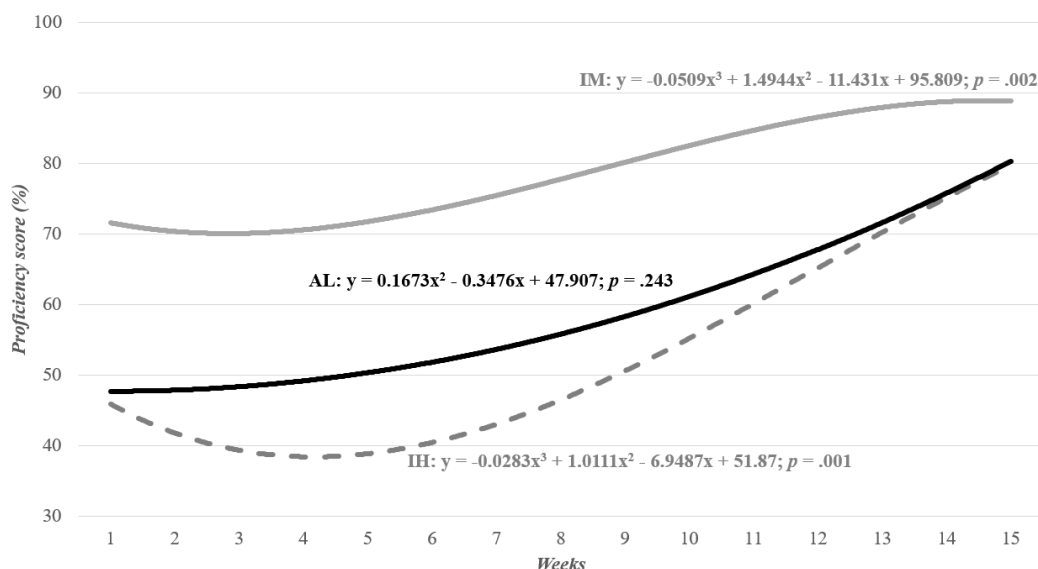
Her Generation Z psychological and emotional profile indicated that she did not differ greatly from others in terms of language anxiety, language enjoyment, emotional regulation, loneliness, and social interaction anxiety, but showed a considerably lower score of 1.100 compared to 1.850 out of 4 for fear of missing out (i.e., "the pervasive apprehension that others might be having rewarding experiences from which one is absent", Przybylski et al., 2013, p. 1841) and of 1.200 compared to 1.794 out of 4 for sensation seeking (i.e., "seeking varied, novel, and complex sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experience", Jeong et al., 2016, p. 11). She also resembled her peers regarding smartphone usage for connectedness, productivity, empowerment, continuous use, and anxious attachment, but displayed considerably higher levels of phone addiction with a score of 3.250 compared to 2.406 out of 4. Finally, Nancy was very similar to her peers with about three quarters of her network consisting of interactions with friends and family in languages other than French, and only a very minor proportion of interactions in French (4.72%).

4.3. RQ3 - Nancy's SA Experience

Nancy studied abroad in her Senior year, in Spring 2022. She was on French soil for 15 weeks.

4.3.1. Proficiency Development

Nancy's proficiency development revealed non-linear patterns (Figure 3). While her self-assessed Intermediate-Mid skills plateaued and her Intermediate-High skills decreased until week 4 – a sign of initial overestimation – they then steadily increased, together with her Advanced-Low skills, all passing 80% by the end of SA.

IM: $y = -0.0509x^3 + 1.4944x^2 - 11.431x + 95.809$; $p = .002$

AL: $y = 0.1673x^2 - 0.3476x + 47.907$; $p = .243$

IH: $y = -0.0283x^3 + 1.0111x^2 - 6.9487x + 51.87$; $p = .001$

IM: Intermediate-Mid; IH: Intermediate-High; AL: Advanced-Low

FIGURE (3): SELF-ASSESSED PROFICIENCY DEVELOPMENT

4.3.2. Multicultural Personality

The development of Nancy's multicultural personality (Figure 4) revealed a parallel trend of decreases in social initiatives and flexibility, accompanied by an almost identically reverse increase in open-mindedness, whereas emotional stability remained rather stable. Finally, cultural empathy first increased during the first half of SA and then decreased during the second half.
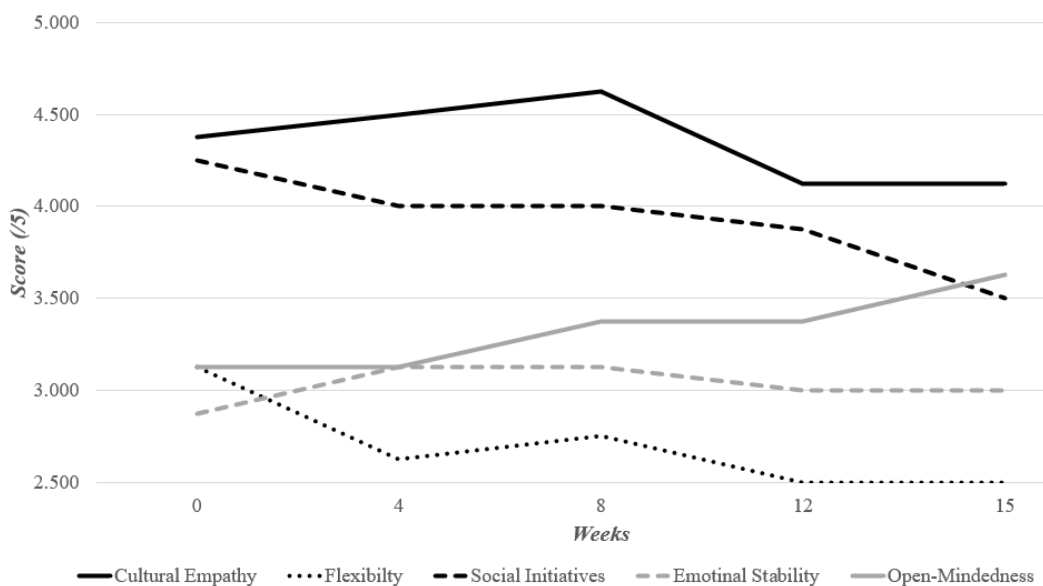

FIGURE (4): MULTICULTURAL PERSONALITY DEVELOPMENT

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4.3.3. Meaningful Social Interactions

Five types of interactions formed the core of her repertoire of social practices.

4.3.3.1. Homestay

Throughout SA, Nancy's host parents appeared in her monthly social network report as people she meaningfully interacted with daily, exclusively in French, for one to three hours each time, primarily face-to-face but also via online writing. She described her living conditions:

> I live with my host parents and their son who's [also] 21 (...) The neighborhood is right by Pigalle (...) by the metro stop, so it's easy to get around (...) I eat dinner with my host family three times a week (...) Sometimes it's four times. (mid-interview)

By the end of SA, she credited them as being the most memorable aspect of her experience:

> I really loved it and I think that was such a unique experience, the conversations I had with them (...) We talked about [politics], obviously because the election just happened. What was [also] interesting for me was comparing psychologists from the US to France because my host mom was a school psychologist, and my ultimate career goal is to become a psychologist (...) And just trading stories about culture in France and in the U.S. (post-interview)

4.3.3.2. Volunteering

In her post-interview, Nancy credited her three weekly hours of experiential learning as the most constructive activity for her language development. Nancy was one of the rare students who had not chosen to be an English teaching assistant in a school. Rather, she volunteered among French locals as a consultant.

> I found two things that I like (...). It's a bunch of young people that help older people (...) doing stuff on their phones and computers. It's really cool – I like it a lot and they're very inviting. It's all in French which helps me, too. And then I help kids like elementary through collège with homework after school. It's mostly French stuff. They have reading assignments and then they have spelling. And I like that, too. So I kind of get the two opposite age groups to work with. (mid-interview)

Although none of these interactions appeared on her monthly social network report due to the rotating nature of these consultations, they were all carried out exclusively in French.

4.3.3.3. Healthcare

The third situation Nancy credited as meaningfully contributing to her growth was when she got sick. She described her experience:

> Navigating the French healthcare system was a little scary because doing it all in French when you're not feeling too great can be a lot. But, it worked out and so that was a good obstacle. [And then, later,] I had a doctor's appointment (...) because I needed a French prescription (...) and I did the whole thing in French and there were no issues with us understanding each other and it was just really cool. So, it's cool to see how I've progressed already (mid-interview).

4.3.3.4. Co-Nationals

Although Nancy took daily courses with the co-nationals in her program, she only had regular meaningful social interactions with a couple of them beyond classes. Indeed, her monthly social network report showed that Mia and Kelly[2] were two co-nationals with whom she systematically interacted for 2-3 hours daily, face-to-face or through online writing, with a true effort to speak French together, between 20% and 90% of the time at different moments during SA. This effort to speak French with co-nationals differentiated Nancy from all other participants in the group evaluated here.

4.3.3.5. Family and Friends from Home

Nancy's monthly social network reports revealed that, among loved ones at home, she primarily contacted her romantic partner, through daily interactions in English lasting 4.5 to 6 hours, via online writing, online pictures, voice calls, and video calls. Moreover, although many participants were visited by family or friends from home during SA, Nancy was the one who spent the longest being physically reunited with her loved ones – almost a quarter of her time abroad. Although she was separated from them during the first half of her sojourn, during the second half, she was first visited by her romantic partner, for a week at week 7, then by her parents, for one week, and shortly after by her brother, for four days, between week 8 and week 11. Finally two friends visited her for a week during week 15.

4.3.3.6. Summary of Social Network

Figure (5) summarizes the evolution of Nancy's social network throughout SA. While the proportion she dedicated to her friends and family back home plateaued around 32%, the proportion dedicated to interactions in French increased substantially – from 28% to as high as 52% – at the expense of the proportion dedicated to interactions

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[2] Pseudonyms. These students did not consent to participate in the study. No other information about them is available.

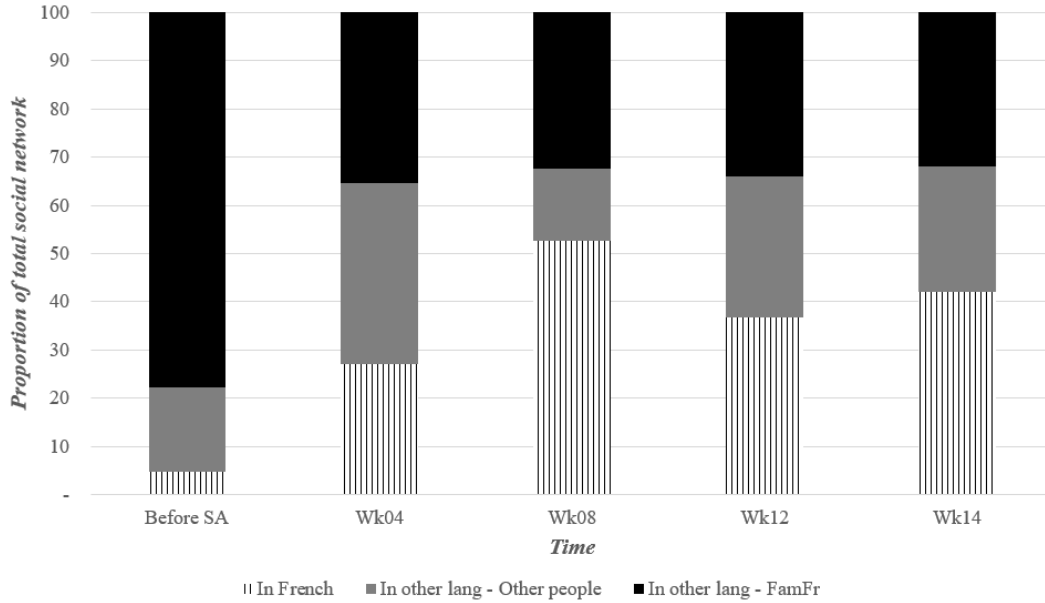in any other language with people outside of her friends and family back home – like co-nationals.

FIGURE (5): PROPORTION OF SOCIAL NETWORK

4.3.4. Phone Usage

Nancy's general phone usage patterns did not differ drastically from those of her peers (Figures 6 and 7). She spent on average 3:18 daily hours on her phone [1:47-5:18] – compared to 3:39 in the group [1:45-6:28], representing about one quarter of daily time awake – and unlocked her phone on average 107 times daily [74-148] – compared to 93 in the group [38-173].
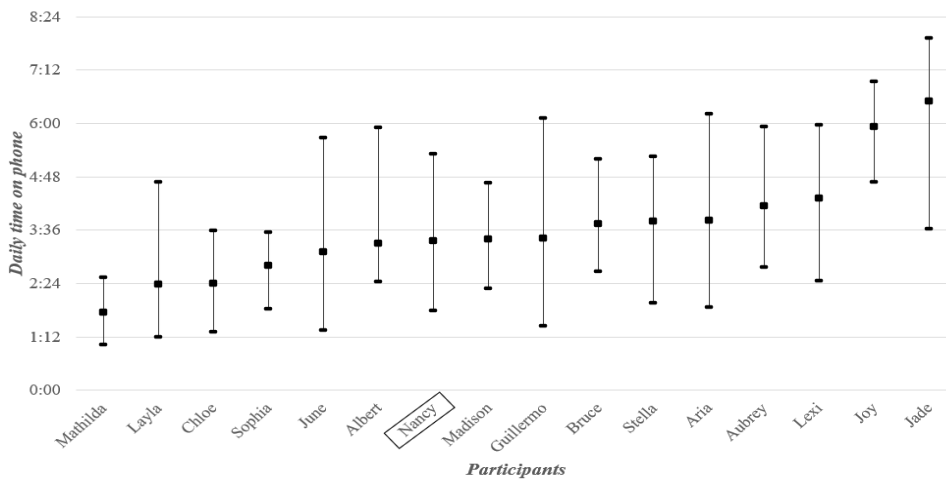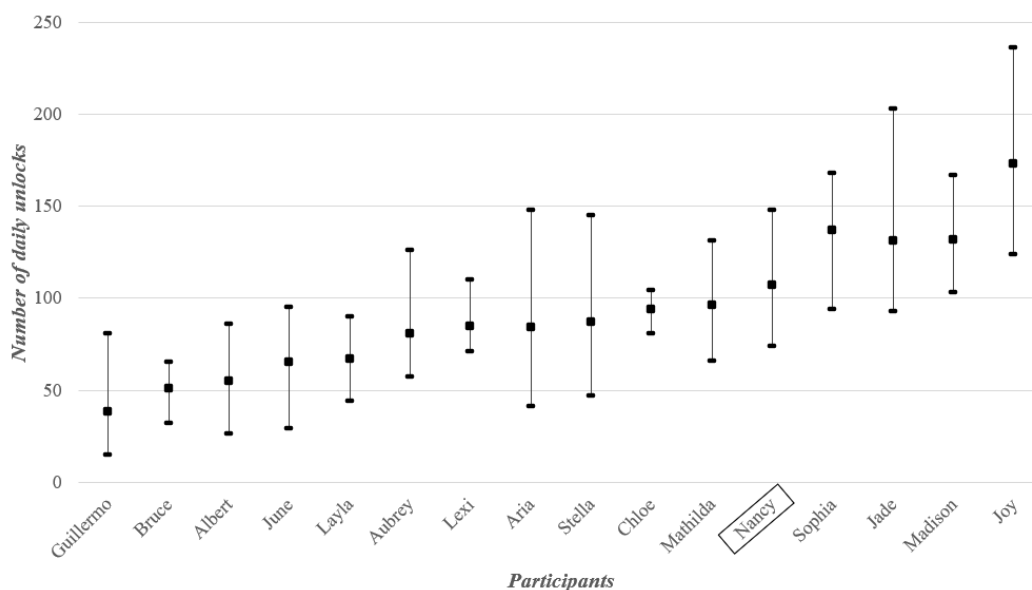

FIGURE (6): PHONE USAGE

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FIGURE (7): PHONE UNLOCKS

More specifically, she decreased her phone usage during the first half of her sojourn but increased it again during the second half (Figure 8). Her daily unlocks slightly but steadily increased from about 100 to about 125. Moreover, she primarily used communication apps (*WhatsApp, Snapchat*), 1:48 daily [1:11-2:31], but steadily decreased their use throughout SA (Figure 9). Conversely, she steadily increased her use of social media (*TikTok, Instagram*) averaging 1:10 daily [0:38-2:02]. Moreover, she consistently used both geolocation apps (*Maps*), about 0:31 daily [0:17-0:51], and general internet search apps (*Safari*), about 0:19 daily [0:12-0:31], although both underwent a slight decline throughout SA. Finally, she started using audiovisual apps (*Netflix*) at week 9 for 0:37 daily [0:26-0:47], but exponentially decreased her use by the end of SA. Similarly to all other participants in the sample, Nancy stated during her post-SA interview that her overall experience would have been much different had she not had her smartphone and that her device had positively impacted the quality of her sojourn. Given this, and considering (a) that Nancy spent about a quarter of her daily time awake on her phone, (b) how instrumental her smartphone usage was as a means to prolong and deepen interactions with her main anchors (her host family, her partner, her two co-national friends), and (c) that one of her main tasks in volunteering was to help older people make sense of how their phone works, it is clear that Nancy's smartphone usage contributed to her overall outcomes.
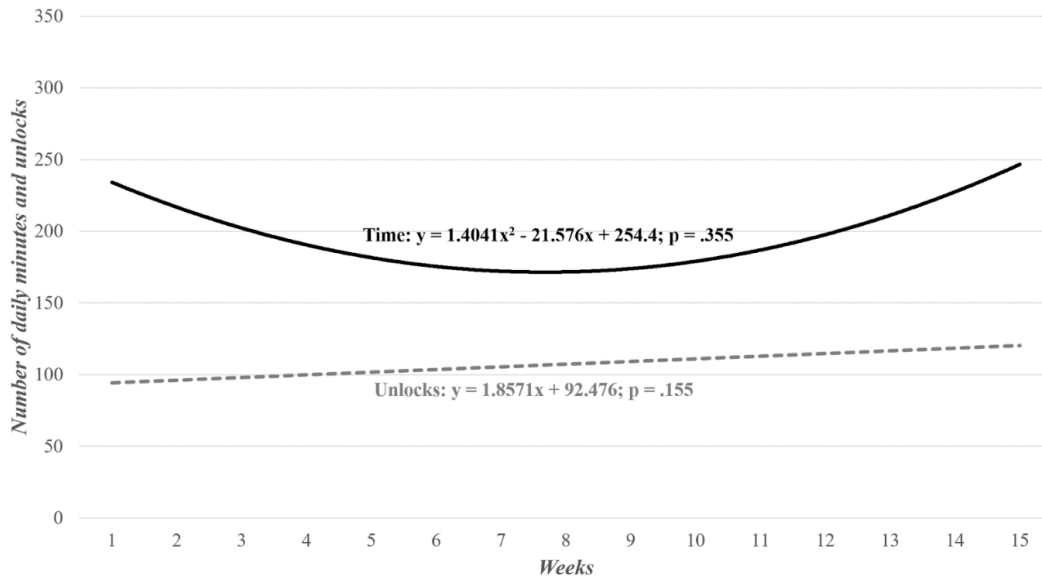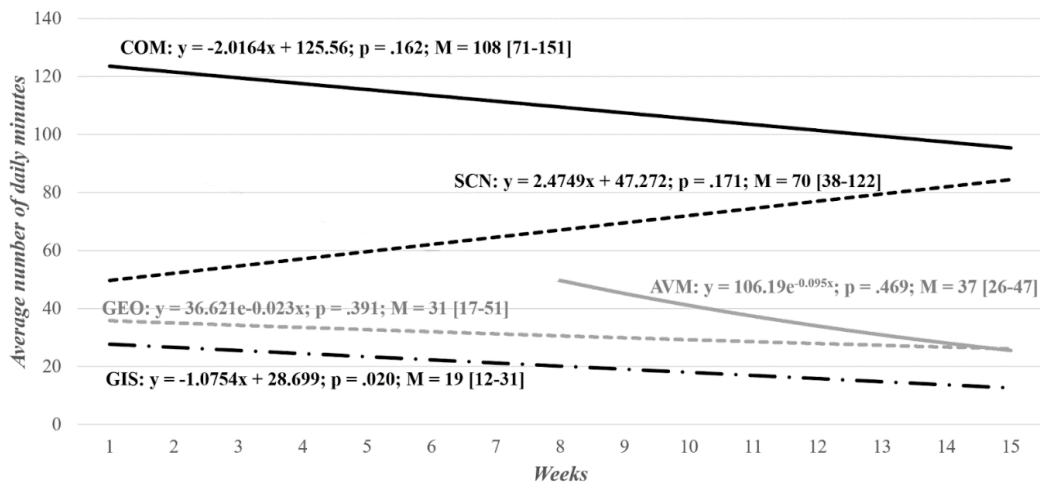
Time: $y = 1.4041x^2 - 21.576x + 254.4$; $p = .355$

Unlocks: $y = 1.8571x + 92.476$; $p = .155$

FIGURE (8): EVOLUTION OF PHONE USAGE

COM: $y = -2.0164x + 125.56$; $p = .162$; M = 108 [71-151]

SCN: $y = 2.4749x + 47.272$; $p = .171$; M = 70 [38-122]

AVM: $y = 106.19e^{-0.095x}$; $p = .469$; M = 37 [26-47]

GEO: $y = 36.621e-0.023x$; $p = .391$; M = 31 [17-51]

GIS: $y = -1.0754x + 28.699$; $p = .020$; M = 19 [12-31]

COM: communication apps; SCN: social media apps; AVM: audiovisual media apps; GEO: geolocation apps; GIS: general internet search apps.

FIGURE (9): TYPE OF PHONE USAGE

4.4. RQ4 - Aspects Less Successfully Impacted by SA

Not all aspects of Nancy's outcome were as positively impacted by her SA experience. Culturally speaking, no particular feature in Nancy's intercultural effectiveness scores contrasted with her peers'. In terms of multicultural personality, her flexibility and social initiatives scores decreased substantially by .625 and .750 points

each, but with rather high pre-SA scores, she actually ended up with scores similar to her peers' – 2.500 compared to 2.425 in the group, and 3.500 compared to 3.492 respectively.

In terms of psychological and emotional markers of Generation Z, whereas Nancy started with uncommonly low levels of fear of missing out and sensation seeking tendencies, she underwent a sizable increase, finishing with scores similar to her peers – 1.500 compared to 1.525 in the group, and 2.750 compared to 2.234 respectively. More detrimentally, her language anxiety and social interaction anxiety scores increased by .375 and .350 each whereas they decreased in the group by -.339 and -.156. Concomitantly, her language enjoyment score also decreased by -.190, ending at 3.762 out of 5, compared to 4.060 in the group.

Finally, in terms of phone affinity, Nancy demonstrated higher levels of anxious attachment and addiction to her phone than the group, with scores of 2.750 and 3.000 out of 4 respectively. For all other aspects, she did not differ meaningfully from the group.

5. Discussion and Implications

5.1. Discussion

Starting her SA journey as an ordinary caterpillar, Nancy turned into a social, linguistic, and cultural butterfly, with gains well beyond her peers', in proficiency, fluency, intelligibility, open-mindedness, social engagement, and life-long linguistic and cultural learning. Nancy resembled Molly in Allen (2010), Gary in Du and Jackson (2021), Joyce and Stephen in Mitchell and Tracy-Ventura (2021), in the role played by the specificity of her initial SA goals and conditions, and subsequent level of agency and success, as conveyed through interviews, background information, and description of setting.

Her outstanding yet non-linear metamorphosis can be traced back to five seemingly inconsequential initial conditions, namely, (a) a complementary academic preparation ensuing from her triple major in French (linguistic), global studies (cultural), and clinical psychology (social), that informed her initial goal-setting, (b) greater intercultural communicative disposition, (c) a heightened sense of perceptiveness, making a point of paying attention and being aware of her upcoming environment, having thusly chosen a homestay option to help fulfill her language objectives, (d) reduced emotional amplitude between a fear of missing out at home and a desire to seek new sensations abroad, and yet (e) heightened phone addiction but with pre-existing communicative phone usage habits entailing interpersonal tasks in French. These initial conditions were instrumental in sparking a butterfly effect, nurturing the formation of a

chrysalis made of agentive attributes that permeated her experience abroad, namely, readiness, intentionality, reflexivity, initiation, iterative practice, resourcefulness, attention, selectivity, and strategy.

As she brought these initial conditions to France, Nancy landed in a host family with whom she quickly bonded – affectively and intellectually – and consistently engaged, in French only, face-to-face and via texts. This was a prime example of how Nancy seems to have agentively used aspects of her initial conditions to activate affordances present in her environment and turn them into transformative forces. Indeed, Nancy connected quite deeply with her host mother who, by chance, was a school psychologist. Building off this shared interest, Nancy's interviews indicated that she sought the opportunity to engage in stimulating, complex, and authentic conversations with her, thus forming a small intellectual community, giving and taking information and opinion in equal measure but from different perspectives (Bass & Elmendorf, 2018). Gathered around the dinner table several times a week, Nancy and her host parents seemed to establish a reliable space and time that served as a fruitful reflection chamber in which Nancy could articulate her experiences, feelings, and thoughts, and think them over deeply and personally – in French. In that sense, Nancy's experience confirms the previously established benefits of homestay and dinner-table conversations (Gautier, 2019; Kinginger, 2019; Mroz, in press; Mroz & Gorham, 2023; Seibert Hanson & Dracos, 2019), as well as Earnest et al.'s (2016) findings about the advantage of combining psychology and SA.

Antithetically to her homestay context, the other person Nancy most consistently engaged with was her romantic partner in the U.S. – on her phone and exclusively in English. It seems that Nancy used the reduced emotional amplitude she had initially displayed between fear of missing out and sensation seeking to reduce the space and time(-zones) that separated them, making her partner a real, meaningful, beneficial character in her SA story who contributed to her emotional and cognitive stability. Complementarily, Nancy had daily face-to-face and text conversations with two peers. Contrary to most in her cohort, Nancy purposefully decided to only spend time with co-nationals she could engage in French with. Similarly to Mitchell and Tracy-Ventura's (2021) Joyce and Stephen, Nancy showed that linguistic, cultural, social, and emotional success in SA can happen through maintaining important relationships in one's L1 *online* with loved ones, and with a few selected co-nationals on site, balancing L1 and L2 use. With only five consistent anchors – her host parents, her partner, and her two classmates – Nancy's small social network was defined by quality over quantity of social engagement, confirming previous findings on the benefits of quality social contacts

during SA (Alonso-Marks & Sánchez Hernández, 2020; Arvidsson, 2019; Baker-Smemoe et al., 2014; Baten, 2020; Bejarano et al., 2019; Gaugler & Matheus, 2019; McManus, 2019; Mitchell et al, 2017; Tullock & Ortega, 2017).

Apart from these main anchors, Nancy's success may be attributed to her readiness. She was able to hit the ground running immediately upon arriving. Having to seek medical care within the first few days presented a prime opportunity to use her superior intercultural message skills to "engage with authenticity and difficulty" (Bass & Elmendorf, 2018). She admitted having embraced the communicative challenge – and thus "deepen[ed] and contextualize[d] her understanding". Indeed, she practiced for the first time "convey[ing] knowledge to an authentic audience" (the medical professionals involved in her care) (Bass & Elmendorf, 2018), explaining her symptoms, obtaining the necessary lab tests, and picking up the prescription from the pharmacy. As she reported feeling *positively* challenged by the experience and proud of her ability to resolve this real-life problem – stating that "it was just really cool and made [her] feel more confident in [her] French" (mid-interview) – she demonstrated her social-pedagogical ability to "connect the affective and cognitive" (Bass & Elmendorf, 2018). These early communicative successes likely lent momentum to the butterfly effect, encouraging her to engage more and more in similar authentic contexts.

Such an opportunity to engage with authenticity and difficulty presented itself again during her volunteering experience. Contrary to the majority of her peers who served as English teaching assistants, Nancy chose to work as a tutor for non-English subjects to an ever-changing clientele ranging from school kids to older local residents. By engaging in the real-world task of helping new interlocutors in new contexts every week, Nancy repeatedly practiced variations of the same linguistic, cultural, and emotional task, namely, using French to talk someone through solving a problem with unforeseen complications and emotional ties – a defining feature of Advanced-level L2 speakers (ACTFL Proficiency Guidelines, 2012) and reminiscent of Mitchell and Tracy-Ventura's (2021) Joyce who interned at a help desk. In so doing, she likely deepened and contextualized her linguistic capacities, taking part in a different intellectual community which might have afforded her a true sense of personal significance. For research purposes, it is worth noting how instrumental a mixed methods approach was to unveiling this precious element of Nancy's social practices, since the people she served as a tutor never appeared on her social network report as these interactions consisted of a multiplicity of single encounters that did not register as the type of "regular contacts" requested. Rather, these encounters were documented elsewhere (directly in the interviews and indirectly in the language engagement questionnaire). It will thus be

important for future research to modify the social network questionnaire used here to account for these repeated social practices that involve different people every time and recommend that its use be triangulated with rich interview data.

Meaningful encounters were also fostered through the combination of Nancy's initial conditions and judicious phone usage. Indeed, although Nancy seemed to be an average user in terms of time spent checking her phone, she primarily used it to communicate via *WhatsApp* with her romantic partner for emotional and cognitive stability. She also continued her initial habits of sending text messages and engaging in social media (*TikTok* and *Instagram*) primarily in French. Furthermore, contrary to most of her peers who displayed moderate to heavy consumption of audiovisual media – primarily in their L1 – which they eventually characterized as an avoidance strategy, a disruption, or an impediment to their engagement in the SA environment, Nancy avoided such activities during the first half of her stay, and only minimally accessed *Netflix* about half an hour a day during the second half. Instead, congruent with her initial goals to attend to her surroundings, she consistently used geolocation (*Maps*) and general search (*Safari*) to intentionally plan, seek, explore, navigate, interrogate, and understand new "linguistic landscapes" beyond her comfort zone (Lomicka & Ducate, 2021).

Perhaps most surprising was the number and length of visits Nancy received. Considering her outcomes and progress, these did not seem to be deleterious to her experience. However, this may be more attributable to Nancy's initial readiness, with an early accumulation of rich, purposeful, beneficial experiences and decisions, than to an inherent benevolence of such visits. Furthermore, it is hard not to notice the concomitance of these visits with both an increase in the time she spent on her phone and a decline in some of her multicultural personality traits – cultural empathy, social initiatives, and flexibility. It is possible that, while busy caring for her visitors, she might have resorted to entertaining them with her phone (*Netflix, TikTok, Instagram*) and the attention she used to pay to her surroundings might have shrunk enough to temporarily affect some of her personality traits. However, in view of Nancy's eventual life-altering decision to remain in France, these were not indicative of a phase of disengagement but a simple pause in her commitment to her objectives. Finally, although other psychological or emotional aspects of Nancy's portrait – social interaction anxiety, language anxiety, language enjoyment – were less successfully impacted by her SA experience, their evolution needs to be relativized since Nancy actually ended up resembling her peers in these regards.

5.2. Implications

Nancy's story offers numerous implications for SA programs. Her trajectory demonstrates the importance of three main factors: (a) agency in seizing opportunities, (b) judicious smartphone usage, and (c) latency in initial conditions. The latter ought to be optimized during pre-SA orientation since they influence later actions, choices, and habits. Regarding mobile devices, Nancy's story confirms that phone usage is not inherently detrimental to SA gains but that judicious use is what matters. This is particularly important, since all participants in the broader study unanimously agreed that having access to their smartphones abroad substantially impacted their experiences, whether positively or negatively.

Prior to departure, students should practice L2 communication via text messages and social media, making it more likely for them to maintain online L2 interpersonal engagement during SA. Additionally, orientation should include explicit articulation of linguistic, cultural, psychological, and emotional goals and apprehensions, with students brainstorming the types of decisions they could later make to create fruitful rather than hindering circumstances. Emphasis should be placed on the importance of an agentive mindset allowing them to be ready and intentional, i.e., on the need to 'rip off the band-aid' and immediately seize opportunities for confronting challenging interactions, no matter how uncomfortable, to avoid the inertia that occurs when initially avoiding difficult interactions. Finally, students should be encouraged to reflect ahead of departure on the impact of having loved ones visit them on site – particularly in relation to their learning goals.

During SA, students should be frequently asked to remind themselves of their goals to maintain the intentionality established pre-SA and prompted to evaluate the actions they have taken or still need to take towards achieving them – including assessing their phone usage and evaluating the amount and quality of contact they develop with co-nationals vs. local residents. Relatedly, in view of how beneficial Nancy's volunteering experience was in contrast with that of her peers in the group who had predominantly selected to serve as English teachers, SA programs should look for more internships and volunteering opportunities that require interacting with locals in the L2 – particularly if homestays are not an option – selected to provide students with core aspects of social pedagogies, namely, representing knowledge to an authentic audience, participating in intellectual communities, connecting affectively and cognitively, valuing both the process and product of learning, and engaging with difficulty and authenticity (Bass & Elmendorf, 2018). Students should also be guided to recognize opportunities arising by happenstance – such as Nancy's visit to the doctor's office – and be encouraged to embrace rather than

avoid them. More generally, taking advantage of students' hyper-connectedness should guide programs' offerings. Activities relying on purposeful phone use to explore, document, and discuss unfamiliar aspects of one's surroundings from multiple perspectives should be required (see Lomicka and Ducate, 2021). Moreover, students should be reassured that keeping frequent online contacts with their loved ones need not be deleterious but can in fact support their growth, especially if balanced with contacts with the local population in the L2. However, they should also be cautioned that frequently consuming audiovisual media on their phone, particularly if it is neither in the target language nor about the target culture, will likely hamper their success. Gen Zers, in particular, may require regular reminders about deliberate phone use to combat the attention overload caused by floods of online information (Patino, 2019).

6. Conclusion

This study contributed to advance SA research by offering a renewed approach to longitudinal case studies focusing on Generation Z learners and their smartphone usage. Framed by an innovative combination of CDST and social pedagogies and grounded in dense, complementary data, the study retrodictively tracked, documented, explained, and illustrated why and how Nancy, an ordinary hyper-connected 21-year-old American SA student in Paris, demonstrated remarkable yet non-linear linguistic, cultural, social, psychological, and emotional growth compared to her peers in the same program.

A butterfly effect was unveiled whereby some seemingly inconsequential aspects of her initial conditions – academic path, intercultural dispositions, emotional balance, perceptiveness in goal setting, and preexisting L2 phone habits – set the stage for more fruitful actions, reactions, and interactions during SA. From the selectivity of her social network anchored in a small number of crucially supportive L1 and L2 interlocutors with whom she interacted both face-to-face and on the phone, to the bold readiness she displayed early when confronted with challenging situations (seeking healthcare), to the rigor she demonstrated in iteratively practicing problem-solving (volunteering as a tutor), to the attention she dedicated to exploring and understanding unknown parts of her environment (relying on *Maps* and *Safari* for daily explorations rather than staying in her room watching *Netflix*), Nancy's entire experience was permeated by intentionality and agency. By conveying knowledge to authentic audiences, thus participating in her own intellectual communities outside of class, valuing both her learning process and product, and connecting cognitively and emotionally when engaged with difficult situations (Bass & Elmendorf, 2018), she turned the tacit social affordances of her SA environment into transformative forces that fostered multifaceted growth. Such a success story informed a series of practical recommendations pre- and during-SA,

including scaffolding students into articulating and frequently revisiting clear learning goals and non-avoidance strategies for challenging situations, making judicious use of their phone for social bonding, explorations, and emotional support, offering them true opportunities for meaningful L2 encounters with local residents, and recommending that they avoid only centering their experience on interactions with co-nationals.

Although this study was not intended to provide a one-size-fits-all approach as there are certainly multiple paths to successful SA, it nonetheless uncovered some important patterns that could be useful in informing SA programs and preparing students during pre-departure orientations. Moreover, as a case study, these findings are not meant to be generalizable and do not indicate definitive causality, but rather represent informed retrodictive analysis that provides local causal explanations, in accordance with CDST. Lastly, much of the data for this study stem from self-reports and thus ought to be considered critically. Further research is needed to replicate this model of retrodictive case studies rooted in social pedagogies given that this framework is particularly well-suited to the SA context, with its emphasis on experiential learning, authentic interactions, and intellectual community. Additional studies could trace the journeys of SA students with exceptional outcomes in various contexts such as different target languages, lengths of stay abroad, and program types. In this way, future research can be of importance in contributing to the field's understanding of the forces at play that impact students' SA experiences and outcomes.

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