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THE RELATIONSHIP BETWEEN FLOW AND L2 SPEECH PRODUCTION QUALITY WITH ESL SPEAKERS

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LA RELATION ENTRE LE FLOW ET LA QUALITÉ DE LA PRODUCTION DE LA PAROLE EN ANGLAIS LANGUE SECONDE

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TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABSTRACT

The objective of the present research was to examine the relationship between the state of flow, L2 speech production quality and perceived L2 perceived proficiency. The state of flow is an optimal experience that is beneficial in many different professional, academic and athletic fields. However, in L2 education, little research has investigated the state of flow and its potential impact on L2 performance. Since being in a state of flow structures attentional resources, and speaking in an L2 is taxing on L2 learners' attentional resources, the state of flow should have a relationship with the quality of speech production. Furthermore, perceived proficiency has been shown to play an important role in both flow experiences and speech production quality. Therefore, we formulated the following research questions: 1) Does self-assessed proficiency and perceived task-difficulty interact with flow intensity during an L2 narration task? 2) Does flow interact with speech production quality during an L2 narration task? A total of 39 undergraduate university students participated in this research. Perceived proficiency data were obtained with a self-assessed proficiency questionnaire. A picture-cued narration task was used to collect speech production data. Finally, flow experience and perceived task-difficulty data were collected with a validated flow-perception questionnaire. The results suggest that the more proficient participants are, the more they experience flow during an L2 narration task. Also, higher levels of flow were associated with more accurate and fluent speech. However, trade-off effects appeared to have a negative effect on complexity. This study contributes to the body of research on flow in L2 performance, but more needs to be done in order to get a better understanding of how flow interacts L2 performance.

Keywords: flow, L2 speech production quality, perceived proficiency, CAF measures

RÉSUMÉ

L'objectif de la présente recherche était d'examiner la relation entre l'état de *flow*, la qualité de la production orale en L2 et la compétence perçue en L2. L'état de *flow* est une expérience optimale qui est bénéfique dans de nombreux domaines professionnels, académiques et sportifs. Cependant, en L2, très peu de recherches se sont concentrées sur la relation potentiel entre l'état de *flow* et la production langagière. Puisque l'état de flow structure les ressources attentionnelles et que le fait de parler dans une L2 met à rude épreuve les ressources attentionnelles des apprenannts en L2, nous nous attendions à ce que l'état de flow ait une intéraction positive sur la qualité de la production orale. Lorsqu'un individu se retrouve dans un état de flow, ses ressources attentionnelles se structurent, et lorsqu'un apprenant parle dans sa L2, un maximum de ressources attentionnelles est nécessaire. De plus, il a été démontré que la compétence joue un rôle important tant dans les expériences de flux que dans la qualité de la production de la parole. Par conséquent, nous avons formulé les questions de recherche suivantes : 1) La compétence auto-évalué et la perception de la difficulté de la tâche interagissent-elles avec l'intensité du débit ressentie pendant une tâche de narration en L2 ? 2) Est-ce que le flow interagit avec la qualité de la production de la parole pendant une tâche de narration en L2 ? Pour répondre à nos questions de recherche, nous avons recruté 39 étudiants universitaires de premier cycle. Les données sur la compétence ont été obtenues à l'aide d'un questionnaire d'autoévaluation de la compétence. Une tâche de narration illustrée a été utilisée pour recueillir des données sur la production de la parole. Enfin, les données sur l'expérience *flow* ont été recueillies à l'aide d'un questionnaire validé sur la perception *du flow*. Les résultats suggèrent que plus les participants sont compétents, plus ils atteignent un niveau de flow élevé pendant une tâche de narration en L2. De plus, des niveaux de *flow* plus élevés ont été associés à une parole plus précise et plus fluide. Cependant, les effets de compromis semblent avoir un effet négatif sur la complexité. Cette étude contribue à l'ensemble des recherches sur l'aisance dans la performance de la L2, mais il faut faire davantage pour mieux comprendre comment le débit influence la performance de la L2.

Mots-clés: flow, production orale en L2, compétence perçue

CHAPTER I

RESEARCH PROBLEM

1.1 Introduction

Motivation is an essential element of the second language (L2) learning process because it helps students become involved in tasks, and once they are involved, motivation helps learners pursue tasks further (Dörnyei and Csizér, 1998). Motivation is especially relevant in an L2 learning situation since learning a language is a long, arduous and non-linear process requiring perseverance (Hohenberger & Peltzer-Karpf, 2009). Language learning also involves frequent mistakes and possible corrective feedback, which can lead to negative emotions such as stress and embarrassment, furthering the need for strong intrinsic motivation. Recent L2 research (e.g., Egbert, 2003; Guan, 2013; Aubrey, 2017; Cho, 2018; Zuniga & Rueb, 2018) has shown interest in a type of intrinsic motivation known as *optimal experience*, commonly referred to as *flow*. Flow is a state of mind "during which people are so involved in an activity that nothing else seems to matter; the experience itself is so enjoyable that people will do it even at great cost, for the sheer sake of doing it" (Csikszentmihalyi, 2008. p. 4). The construct of flow is composed of four main dimensions: the balance between skills and challenge, focused attention, intrinsic interest, and control over actions. In order to

experience a state of flow, people must perceive themselves as having the skills to match the challenge of the task. The challenge needs to be perceived as being neither too low nor too high relative to the perceived skills of the task participants (hereinafter referred to as task-doers). Also, task-doers need to have an intrinsic interest in the task and a sense of control over its outcomes. Finally, the combination of these factors allows their attentional resources to be entirely focused on the task. According to the flow theory, these four dimensions define the flow experience. In a learning context, flow represents an optimal learning state, in that learners are focused, interested in and challenged by a task in which they have control over their actions and the task's outcomes. Flow should be related to enhanced task performance because the positive experience associated with it makes learners spend more time on task, and in order to maintain a state of flow, they must incrementally increase the difficulty of the task as performance improves to avoid boredom, an anti-flow state (Csikszentmihalyi, 2008).

1.2 Flow in the L2 context

Flow has been examined in the L2 classroom with the principle goal of determining the types of tasks that are the most amenable to creating an optimal experience for learners. To our knowledge, the first researcher to work on flow in an L2 context (Egbert, 2003) found that American learners (between 14 and 18 years old) of Spanish as an L2 experienced flow through many different types of tasks in their foreign language class. In the study, the students experienced the most flow while participating in chatting and email activities with native speakers of their foreign language.

Kirchhoff (2013) found that learners were able to experience flow while reading. Furthermore, higher flow levels have also been observed in learners who participated

in intercultural task-based oral interactions, as compared to learners who participated in intracultural ones (Aubrey, 2017). In a more recent study, Zuniga and Rueb (2018) observed that tasks involving competition, interaction and movement were the most flow-enhancing. These studies have focused on task influence on flow, but they do not demonstrate the potentail influence of flow on L2 performance.

Despite the current research on flow and task characteristics (e.g., Egbert, 2003; Kirchoff, 2013; Aubrey, 2017; Cho, 2018; Zuniga & Rueb, 2018), to the best of our knowledge, there is only one study examining the flow experience and L2 learning (Amini, Ayari and Amini, 2016). This study investigated the relationship between vocabulary retention and flow. They found that the level of flow was positively correlated with short-term and long-term retention of vocabulary in an EFL context. Now, if teachers are going to invest time in creating situations that generate flow in their language classrooms, it is necessary to establish a better understanding of how flow influences L2 learning. Research has shown the manner in which the state of flow is beneficial in many fields (Csikszentmihalyi, 1975), but without clear evidence of its positive impacts on students' L2 speech production, the effectiveness of encouraging it within the classroom environment will be limited. In the following section, a model of how flow might interact with L2 speech production will be presented.

1.4 Flow and L2 speech production

Levelt (1989) created a speech production model to describe how language production operates from the spark of an idea to the choice of words and their grammatical arrangement, and finally to the articulation of meaningful utterances. The primary purpose of creating such a thorough model that takes into account every step of speech

production was to be able to understand not only speech production but also to locate the locus of potential problems in the speech production process. Production starts in the conceptualizer where preverbal messages are formulated according to speakers' communicative intentions. These preverbal messages are passed on to the formulator for grammatical encoding, and finally to the articulator, which translates the grammatically encoded message into sound. The utterance then goes through the speech comprehension system, which allows immediate feedback.

The Levelt model has inspired L2 speech production models (e.g., de Bot, 1992; Segalowitz, 2010), which illustrate how the L2 formulator and articulator processes are less automatized than L1 processes and therefore more taxing on L2 learners' attentional resources. Such a reduction in attentional resources has been shown to decrease precision and increase disfluencies in L2 production (Zuniga & Simard, 2018). Since the state of flow structures attentional resources, one might thus expect it to interact with fluency, which is a measure of speech production that requires attention (Segalowitz, 2010). Furthermore, the optimization of attention associated with the state of flow might also enhance preverbal planning (the planning that is done before language appears in the production process), thus positively impacting production accuracy.

To summarize, if the quality of speech production depends on engagement and efficient attentional resource allocation to the aforementioned production processes, one might expect the attention-focusing flow state to have a positive impact on speech production quality.

1.5 Research objectives

As previously mentioned, motivation is an essential factor in L2 learning, and the negative emotions associated with a lack of motivation can negatively impact learning outcomes (Shernoff, D. J., Csikszentmihalyi, M., Shneider, B., & Shernoff, E. S., 2003). The state of flow is a form of intrinsic motivation that is to be an optimal state for learning and performance (Csikszentmihalyi, 2008). Most of the flow research related to L2 learning has focused on the types of tasks that make students experience flow, but there is a distinct lack of research investigating whether the state of flow impacts L2 speech production or not. Since speech production is a dynamic process that requires attentional resources, especially when speaking in an L2 (Segalowitz, 2010), and since the state of flow structures attentional resources (Csikszentmihalyi, 1998), being in a state of flow might help learners improve their speech production quality.

With the research gap presented in this chapter, the main objective of this research is to determine if there is a relationship between learners' flow experiences and L2 speech production performance as measured by fluency, complexity and accuracy. Since proficiency has been shown to have an impact on both flow and speech production, the perceived proficiency will also be a variable in this research.

1.6 Scientific and social relevance

The present project fits into the context of research that aims to enhance motivation and affective conditions in the classroom. Learners can be unmotivated, and it is easy for them to develop negative emotions that will have a detrimental impact on their

overall learning. With a better understanding of the relationship between the state of flow and L2 performance in speech production, it would justify the use of flow-enhancing techniques in L2 classrooms to not only help motivate students but also (and more importantly) to enhance L2 learning. Moreover, if learners perform better when engaged in a task where they experience flow, such tasks could be used to evaluate students more effectively, given that teachers always seek to evaluate students in situations that will demonstrate their full linguistic potential.

In terms of social relevance, Csikszentmihalyi's theory of flow is still a relatively new one (to the L2 field) that could prove applicable and useful to a wide variety of fields. With additional research based on this theory, there will be a better understanding of the need (or lack thereof) for a focus on flow within the field of second language acquisition (SLA). Overall, if being in a state of flow reflects an optimal state of learning, which helps to foster learners' intrinsic motivation in a positive environment, the collectivity will benefit from furthering knowledge on this specific subject.

CHAPTER II

THEORETICAL FRAMEWORK

2.1 Introduction

In this chapter, the concept of flow and its dimensions (2.2) will be described. Then, flow research in the SLA field (2.3) will be presented. Subsequently, a model of L2 speech production (2.4) and the reasons as to why flow could have an impact on the quality of speech production (2.5) will be explained. Then, the research questions will be presented (2.6).

2.2 The concept of flow

Csikszentmihalyi (2008) began working on the state of flow in the 1970s. Csikszentmihalyi was interested in people's happiness, creativity and success and he sought to understand how those human processes work. After years of research, across various professional, athletic and academic fields, around the world, he described the concept of flow as a state of consciousness that appears when "people become so involved in what they are doing that the activity becomes spontaneous, almost automatic; they stop being aware of themselves as separate from the actions they are performing" (Csikszentmihalyi, 2008, p. 53). Flow is an experiential state that has been similarly described by people across the globe, despite differences in culture and the nature of the tasks being performed (Csikszentmihalyi, 2008).

The theory of flow is phenomenological and existential (Moneta & Csikszentmihalyi, 1996), as its foundation relies on people's perception of their subjective experiences. Therefore, objective experiences are less valuable within this framework; two people could experience the same situation and react in two different ways because their perception of the situation is not the same (Nakamura & Csikszentmihalyi, 2009). Csikszentmihalyi (1975) explains that this is because some people have a more autotelic personality, which is to say that it will be easier for them to enjoy what they are doing with the absence of external rewards. Furthermore, the state of flow is also described as an optimal affective state that people experience when they are fully engaged in meaningful and challenging, but doable tasks. People often refer to it as "being in the zone" or "being in the groove", and it is usually described as being a moment of intense concentration and focus, which includes an altered sense of time, often leaving the individual feeling like time is passing more quickly than usual (Egbert, 2003).

2.2.1 The measurement of flow

As mentioned above, flow is a subjective experience and measuring the quality of subjective experiences can be difficult. Egbert, who designed a questionnaire to measure flow in an L2 context, claims that "there is no objective way to measure flow precisely" (Egbert, 2003, p.508). As such, the state of flow has been measured in many different ways. Nakamura and Csikszentmihalyi (2009) reviewed these measures and found that semi-structured interviews were used to calculate flow in a real-life context. An advantage of using interviews is that it gives detailed descriptions of the subjective experience (Nakamura & Csikszentmihalyi, 2009). A disadvantage is that those interviews were often conducted a few minutes after the interviewees experienced flow

(if not later), and their memory was therefore not always fresh, which is essential considering flow's dynamic distinction from other emotional states.

The primary method that has been used to collect flow data is the *experience sampling method* (ESM) developed by Csikszentmihalyi and his colleagues in the 1970s (Csikszentmihalyi, 1975). This method consist of "repeated self-reports in response to randomly generated electronic signals transmitted to pagers that respondents wear for a week" (Moneta & Csikszentmihalyi, 1996, p.280). When the participants received the signal on their pager, they had to fill out a two-minute questionnaire soliciting information about their affective state and the activity in which they were involved. The main strength of this method is that the "signals are random and often far apart" (Kubey & al., 1996, p.105), which can lead to a better understanding of flow in the context of everyday life. Csikszentmihalyi explains that "data collected with the ESM are representative of what people do from morning to night, they can be accessed again and again for different purposes" (Csikszentmihalyi, 1975, p.xxi), which translates into an enormous economy of time and money. The results of Csikszentmihalyi's research (1975) show that people in a state of flow perceive a balance between their skills and the challenges of a task, experience intense concentration, have clear task goals and direct feedback, feel a sense of control, a lack of self-consciousness and a distorted perception of time (e.g., time passing quickly). The ESM has been validated in numerous flow studies (See Csikszentmihalyi & Larson, 1987; Csikszentmihalyi & Lefevre, 1989; Moneta & Csikszentmihalyi, 1996; Shernoff et al., 2003). The results of this body of research have led to the development of what is referred to as the four main dimensions of flow (skill-challenge balance, a feeling of control, focused attention and interest), which will be presented in the following section.

2.2.2 Dimensions of flow

The ESM technique helped to create a large pool of data collected from thousands of participants, which was used to create a profile of when and how people experience flow in everyday life (Csikszentmihalyi, 2008). From this data emerged the four main dimensions of flow: skill-challenge balance (2.2.2.1), control (2.2.2.2), focused attention (2.2.2.3), and intrinsic interest (2.2.2.4). Those four dimensions are used to determine if someone is experiencing flow or not.

2.2.2.1 Balance between skills and challenges

Flow-generating activities are challenging, which means they require specific skills. As presented in the figure below (figure 2.1), when the challenges presented by the task are too high, and the skills needed to accomplish the task are too low, one will experience anxiety and its debilitating effects on attention. At the same time, the perception of adequate skills and little challenge can result in boredom, and low skills and low challenge, apathy, both having a destructuring effect on attention. It is when both the challenge and the skills are high that learners are more likely to experience flow. Csikszentmihalyi (2008) explains that this dimension of flow allows people to achieve more, to grow and to evolve in more positive ways.

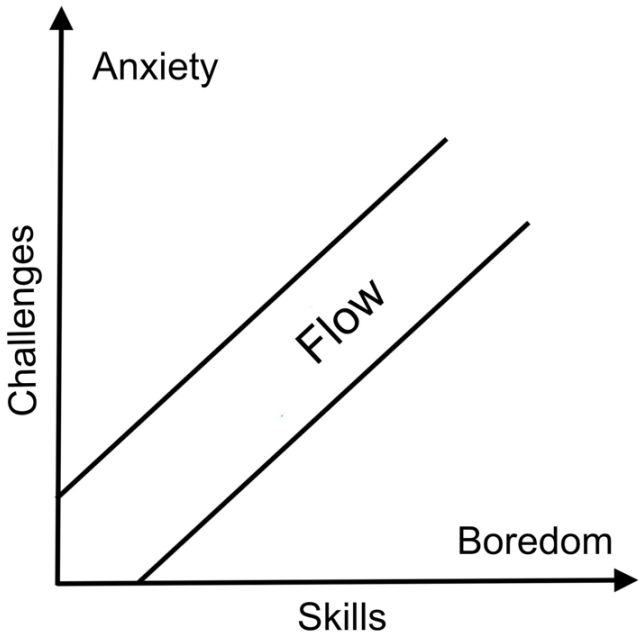

Figure 2.1: The skill-challenge dynamic (Inspired by Csikszentmihalyi, 2008, p. 74)

Perception is a significant factor to take into consideration for this challenge/skill dimension of flow. It is not the real challenges or skills that count, but the perception people have of their own sets of skills and the perception they have of the challenges they are facing (Moneta, G.B. & Csikszentmihalyi, 1996). Naturally, some people may perceive their skill level as insufficient or too high for the challenge, and therefore have a distorted vision of the balance between skills and challenges, which itself can guide their experience in a positive or negative direction. For example, if students are lacking confidence and do not believe they have the skills to achieve a given oral production task, they might think the challenge is too high, which can trigger anxiety (an anti-flow state). This anti-flow state will then lead students to not perform at their full potential.

Moreover, this dimension of flow can be linked to other similar concepts in SLA, such as Krashen's input hypothesis (Krashen, 1985), which states that learners of second languages need to receive comprehensible input that is slightly beyond their actual skill level for learning to occur. Vygotsky's zone of proximal development (Chaiklin, 2003) theory can further help us to understand this skill/challenge balance dimension. In this socio-constructivist theory, Vygotsky states that to learn, students need to be in their zone of proximal development, which is a zone where the learners are not able to solve a problem on their own but can succeed with the help of someone who has the knowledge and skills needed to solve the problem (Woolfolk, 2005). Both Vygotsky's and Krashen's theories are linked to this dimension because, in both cases, the learners need to encounter a challenge that is slightly beyond their actual skill level.

In sum, the state of flow occurs when "the optimal level of challenge stretches existing skills […] resulting in a more complex set of capacities for action" (Nakamura & Csikszentmihalyi, 2009, p.92). Flow creates an upward spiral that pushes people to challenge themselves and, therefore, to improve their skills in order to maintain this balance between skills and challenges. This upward spiral helps people spend more time on task and incites task repetition, which ultimately leads to improved performance. However, to be able to push the challenge and to improve their skills, people need to have some control over the task they are doing.

2.2.2.2 Control

Csikszentmihalyi (2008) emphasizes the importance of control as being essential to the state of flow. The dimension of control can be divided into two aspects one related to

human agency and the ability to make decisions, and the other, to being in control of complex task-related processes.

The human agency factor means that when people experience flow, they are involved in tasks or activities in which they have control over their actions and the task outcomes. However, learners must have the skills to manage the task at hand (Csikszentmihalyi, 2008). For example, in an L2 classroom, giving control to learners would mean assigning them tasks that involve elements of choice, such as letting them choose what they want to read and providing more open-ended comprehension questions without specific response. On the other hand, imposing a specific book with closed questions (with specific response) might usurp this sense of agency and the likelihood of experiencing flow.

As for the other aspect related to the dimension of control , it is about feeling in control in a situation. This dimension of control relates to a person's concerns about losing control and thus is unrelated to control as presented above, which concerns fully controlling a situation. This feeling of control helps people not to develop anxiety associated with the chaos of an uncontrollable situation. Moreover, a task that allows students to make choices can provide a sense of control, which can, in turn, reduce anxiety.

The ability to control the task is essential to maintaining the flow state because task-doers need the ability to adjust task difficulty to correspond to their perceived skills. Csikszentmihalyi mentions that "what counts, […], is the person's ability to restructure the environment so that it will allow flow to occur" (Csikszentmihalyi, 1975, p.53). When people experience flow for an extended amount of time, they might experience

boredom and fall out of flow if they do not have the control to appropriate the task and adjust its level of difficulty.

Furthermore, people who enter a state of flow also need clear task goals (Egbert, 2003). In other words, they need to be aware of the goals and the rules of the task before undertaking it, in order to get a better idea of how they will be able to control and structure their experience. Once the task is on-going, internal feedback (Egbert, 2003) is another aspect that helps people not only maintain a state of flow but go further into it. Even if direct feedback risks interrupting a flow state, people can automatically assimilate the feedback they receive and integrate the changes into the way they are approaching the task. However, for learners to stay in a state of flow, feedback needs to be clear and unambiguous. Otherwise, people risk falling out of flow by focusing their attention on the feedback instead of the task (Csikszentmihalyi, 1975).

As previously mentioned (see 2.2.1.1), flow creates an upward spiral in human development, and the dimension of control allows people to adjust themselves with the task. Furthermore, the feeling of control helps learners transform a regular task into a more meaningful task because they become involved in the process.

2.2.2.3 Attention

Since flow "requires a complete focusing of attention on the task" (Csikszentmihalyi, 2008, p. 58), attention is another essential dimension of the theory of flow. Moreover, since attention is an essential cognitive resource for second language learning (Schmidt, 2001), it makes sense to study attention-structuring effects of flow on L2 learning and performance. Such structuring effects can enhance learning by entirely

focusing fluid attentional resources on the task at hand and by keeping attention-robbing negative emotions such as anxiety at bay.

One typical example of the attention-centring effects is that people in a flow state report losing self-consciousness and track of time (Csikszentmihalyi, 2008), which occurs because all attentional resources are focused on the task, leaving time and self outside of consciousness. Such a lack of self-consciousness would allow language learners, for example, to notice and fully engage with new linguistic elements without fears of potential embarrassment.

Another benefit of flow is related to the structuring effect it has on attention and the positive effect it has on emotions. Csikszentmihalyi explains how the "normal condition of the mind is one of informational disorder: random thoughts chase one another instead of lining up in logical causal sequences" (Csikszentmihalyi, 1998, p.26). During such phases of disorder (e.g., boredom, mind-wandering), the mind's default network tends to bring worrisome or negative thoughts into consciousness (Csikszentmihalyi, 2008), which in turn hinders the mobilization of cognitive resources essential for learning (Fredrickson, 2001; 2013). On the contrary, people who are absorbed by a flow-inducing task lose awareness of such anxiety-provoking problems. It does not mean that learners are necessarily happier during flow tasks, because "to experience happiness, we must focus on our inner states, and that would take away attention from the task at hand" (Csikszentmihalyi, 1998, p.32). The feeling of happiness usually comes afterwards when people look back at the tasks they have accomplished and process the emotions they experienced during their flow state. The positive emotions associated with flow help people develop and sustain the fourth dimension, which is interest.

2.2.2.4 Interest

Flow is a form of intrinsic motivation, which means people who are involved in a flow task (a task that induces flow) will do the task for the sake of doing it. Ryan and Deci (2000) describe intrinsic motivation as "the inherent tendency to seek out novelty and challenges, to extend and exercise one's capacity, to explore, and to learn" (p.70). As such, interest cannot be driven by external factors such as better jobs, better pay or better grades because they will not help people to engage with the task for its own sake without thinking of these new goals to reach (Shernoff & al., 2003). Even if there might be external factors that drive people, when they are in a state of flow, the interest they have for the task is purely intrinsic as they are focused on the task and not on the outcomes of the task.

Additionally, flow occurs when people are primarily driven by the teleonomy of the self, which can be defined as a motivational system that works to organize consciousness to live a positive experience without any environmental factors influencing the process (Moneta & Csikszentmihalyi, 1996). The interest in a task depends on whether it is considered important, urgent, or meaningful (Mitchell, 1988) to the people who are executing it. These characteristics of a task are dynamic. They shift over time and as the other dimensions of flow are evolving (the balance of challenge and skill, the focus of the attention and the control over the task), the dimension of interest changes with them. Some tasks are inherently interesting for some individuals and boring to others. According to the theory of flow (Csikszentmihalyi, 2008), almost every task has the potential to become interesting if the people who are doing it can shape their perception of it and manipulate it in ways that align their perceptions with the dimensions of flow, which suggests that an

important area for L2 research is to work out how teachers can help learners perceive tasks in a fashion that is flow-inducing. To sum up, whether interest is there from the start or gained through the action of the task, the intrinsic interest in a task is present when people are experiencing flow.

Taken together, the skill-challenge balance, focused attention, intrinsic interest, and control dimensions are all involved in the state of flow. To experience flow fully, people need those four dimensions to be present in varying degrees. Clear task goals, direct feedback, altered perception of time, and lack of self-consciousness are other characteristics that are usually involved in a state of flow. However, Csikszentmihalyi (1975) explains that flow exists on a continuum, and therefore, there are microflow experiences and macroflow experiences. When all dimensions are not lived at their fullest, people can still experience microflow, which is defined as "trivial activities [that] appear to fit the flow model, although at a lower level of complexity" (Csikszentmihalyi, 1975, p.141). This is why it is necessary to consider each dimension of flow and take them into account when evaluating a situation that involves flow. In the following section, research on the state of flow in SLA contexts will be described.

2.3 Flow in SLA

In the following section, the research on the concept of flow in L2 research will be described. At first, the studies on the influence of tasks on flow (2.3.1) will be examined, and then the influence of flow on L2 learning and performance will be described (2.3.2).

2.3.1. The influence of tasks on flow in SLA

The concept of flow has been studied in the field of SLA by using flow perception questionnaires administered immediately after completing tasks to determine which tasks were more flow-enhancing or more flow-inhibiting (e.g. Aubrey, 2017; Cho, 2018; Egbert, 2003; Zuniga & Rueb, 2018). The overall goal of these studies has been to understand if flow exists in the classroom, and if so, which tasks help students experience a state of flow.

The first study to explore flow in an L2 classroom (Egbert, 2003) examined the impact of various tasks on learners' flow experience. The participants were 13 anglophone students aged between 14 and 18, learning Spanish as a foreign language. Egbert used a mixed-method protocol in which she collected data on seven separate occasions, for seven different tasks. Data was first collected to obtain students' background information. Then, all the students completed a series of tasks followed by a 14-item questionnaire designed to measure the four flow dimensions. While they were doing the tasks, observational data were collected with a checklist by the researchers. After the completion of the task, qualitative data was obtained through interviews. The results offered evidence that students do experience flow in foreign language classes. They also demonstrated that some tasks were more flow-enhancing than others. In this case, tasks that included chatting via e-mails and talking about themselves were significantly more flow-enhancing than the tasks that did not include these features. These results are not surprising considering that Csikszentmihalyi (2008) emphasizes the importance of novelty, interaction, feedback (like the participants experienced when they were chatting online) and task engagement (like the tasks in which they had to talk about themselves). In a different study (Czimmermann and Piniel, 2016),

advanced language learners' flow experiences were examined in an EFL classroom in Hungary. A total of 85 students completed a creative writing and speaking task in which they had to invent a story and share it with the other students in their class. Before performing the task, learners had to fill out a questionnaire to measure the overall classroom flow experience. Immediately after each task, they filled out a questionnaire to assess during-task flow experience. Results showed that students did experience flow and that boredom was associated with a feeling of lack of control. In other words, students who felt more in control of the task were also more interested.

The relationships between flow and reading in an L2 extensive reading context was examined in a study (Kirchoff, 2013). They gathered questionnaire data from 74 Japanese ESL students between 18 and 20 years old, which consisted of questions on their weekly readings, flow-like experiences, and reading goals. The results showed that participants all experienced flow while reading in a foreign language. The four main characteristics that influenced the emergence of flow were: book content, reading location, book level and reading schedule (Kirchhoff, 2013). The authors argue that L2 extensive reading allows learners to read "understandable and meaningful" texts while improving their "reading ability, fluency, and enjoyment "(Kirchhoff, 2013, p.192).

In a different study, intercultural contact and flow experienced during an oral task performance was examined (Aubrey, 2017). The participants were 63 intermediate Japanese learners of EFL divided into two groups: one of the group did a series of oral tasks with students from another country (intercultural interaction). In contrast, the control group worked with students from their class (intracultural interaction). Results showed that the intercultural tasks were significantly more likely to make students experience flow than intracultural tasks. The author argues that intercultural tasks

provided students with an authentic and meaningful challenge because they knew the person they were talking to would not understand their first language. Hence, they had to use different strategies when they encountered communication breakdowns.

Other research focused on flow and task-based activities in SLA. In Cho (2018), differences in learners' perceptions of task difficulty, skills, and skill-challenge balance concerning task complexity and modality were investigated. The participants were 141 Korean learners of English who completed four argumentative tasks (one simple speaking, one complex speaking, one simple writing, and one complex writing). Simple tasks were tasks that had fewer features, since "the higher the number of features to be considered for task completion, the higher the cognitive demands of the task" (Cho, p.167). After each task, the students completed a questionnaire that included perceived task difficulty, perceived skills, and flow experience (including interest, attention, and control). Results showed that complexity played no role in any aspect of flow experience, which means that the complexity of a task did not have an impact on the level of interest, control or attention of the learners. However, modality (writing/speaking) seemed to influence perceived skills, perceived task difficulty and flow experience. Indeed, writing tasks were more flow-enhancing than speaking tasks. The students were more interested and felt more in control when they were doing writing tasks. Furthermore, the students' skills and challenges were more balanced in the writing task than in the speaking task. Cho (2018) mentions that this difference between speaking and writing tasks might come from the stressful and dynamic nature of speaking tasks, which leaves students feeling as if they lack control and the necessary skills to match the challenge. In a different study, Zuniga and Rueb (2018) aimed to determine how various task characteristics (e.g., modality, targeted competencies, participant distribution, information structure) interact with the flow

experience in L2 classrooms. Using a flow perception questionnaire and a task coding framework, they observed flow intensity during 24 different tasks in French L2 classrooms. The results showed that games and other interactive tasks involving competition and movement generated significantly more flow. Zuniga and Rueb (2018) also found that tasks that involved no planning were more flow-enhancing than tasks that involved planning. This finding is in line with Csikszentmihalyi's (2008) description of the state of flow: since flow is a dynamic state that involves fluid and focused attention, involving planning before a task would make the learners less self-aware and more focused on the plan than on the actual task.

What can be gleaned from these studies is that flow can be found in L2 classrooms all over the world. The way tasks are built can help improve the emergence of a state of flow within a learner. Tasks that include interactions, novelty, technology (Egbert, 2003), intercultural contact (Aubrey, 2017), spontaneity, game, movement (Zuniga & Rueb, 2018), clear goals with feedback, control over the task (Kirchhoff, 2013) seem to help students experience flow. Furthermore, the mode of a task seems to play a role as well, with speaking tasks being more flow-inhibiting than writing tasks (Cho, 2018).

2.3.2 The influence of flow on L2 learning and performance

Being in a state of flow means being in a situation that is just challenging enough to improve skills. It also means having attention focused on a specific task, feeling in control and being intrinsically interested in this task. All these characteristics make the concept of flow a state of mind that can positively influence performance and learning outcomes in an L2 context (Eryilmaz & Ergünay, 2018). However, so far, the influence of flow on learning performance in SLA has not been well documented.

In their research, Amini, Ayari, and Amini (2016) investigated the effect of flow on EFL learners' vocabulary learning. They recruited 65 Iranian EFL learners between 10 and 14 years old, who had to learn 15 new words during three vocabulary-related activities (e.g. role-play, vocabulary cards box, visual samples), after which they completed a flow perception questionnaire (Egbert, 2003). According to the researchers, the most pertinent feature of flow is the balance between skills and challenges because when "the task is too challenging, the individual will not dare to hang on" (Amini & al., 2016, p.15). Since the state of flow creates an upward learning spiral, it allows the learners to grow through a learning experience that can be continuously enhanced through feedback. Finally, the results showed that both short-term and long-term retention were positively correlated with during-task flow experience

While Amini, Ayari, and Amini (2016) provide evidence that experiencing flow during an L2 learning task can enhance learning, this domain remains largely unexplored. Thus, it is essential to examine how the flow state might influence L2 speech production. Since flow is a state of mind that focuses all attention on a task and since it liberates task-doers from negative emotions (e.g. anxiety, stress), which have been shown to have debilitating effects on all stages of speech production (MacIntyre & Gardner, 1994), one might reasonably expect flow be related to enhanced L2 speech performance. This point will be illustrated in the following section.

2.4 Flow and L2 speech production

Levelt (1989) created a speech production model to demonstrate how L1 language production works. De Bot (1992) considered it promising in all aspects, but since

"multilingualism is the rule all over the world and unilingualism the exception […], one could argue that the basic model should be concerned with bilingualism" (De Bot, 1992, p.2) as well. Furthermore, since people rarely reach the same level of proficiency in their L2 as in their L1 (Segalowitz, 2010), and since learning an L1 does not exactly work like learning an L2, it is interesting to look at L2 speech production as a separate concept than L1 speech production. Therefore, de Bot (1992) adapted Levelt's monolingual model of speech production to a bilingual speech production model (see figure 2.2). In his model of speech production in L2, de Bot kept the same main components as Levelt's model, which included the three following main parts: the conceptualizer, the formulator and the monitoring system.

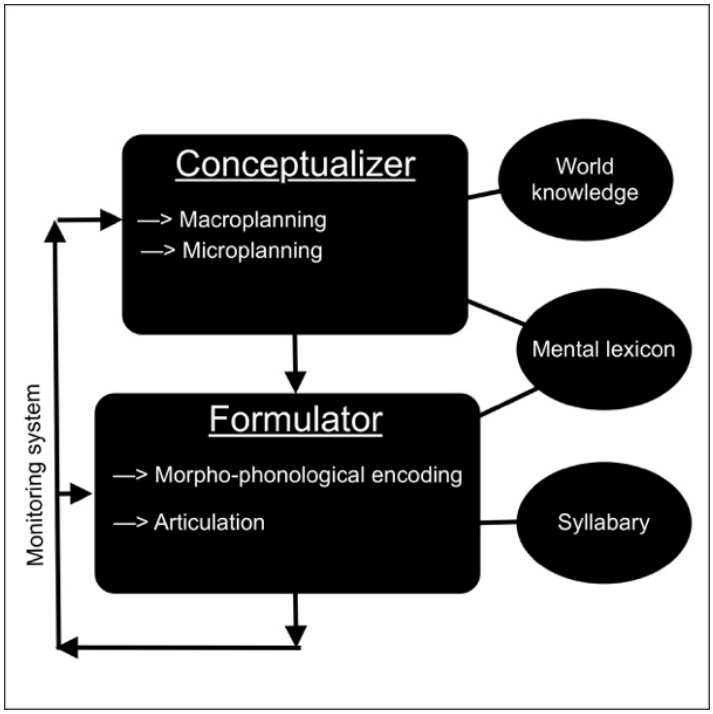

Figure 2.2: Model of L2 speech production (Inspired by Segalowitz, 2010, p. 9)

The main goal of such a model is to illustrate every step involved in speech production of any second language, which is different than for an L1 since it involves different cognitive processes (de Bot, 1992). The circles in the model represent the knowledge (e.g. world knowledge, mental lexicon), whereas the rectangles represent the processing components (the conceptualizer and the formulator). Overall, even though there are many spoken languages in the world, and even if there are many differences between them, this L2 speech production model serves as a guideline of how every L2 is spoken from the spark of an idea (the conceptualization part) to the production of utterances (the formulator part). Since flow is a state of consciousness that requires focused attention on a task, and since L2 speech production involves attention differently than L1 speech production, understanding how L2 speech production works is important to understand how the state of flow could have an impact on it.

According to this model, speech production starts in the *conceptualizer*, where preverbal messages are conceived through macroplanning and microplanning. Macroplanning is when speakers elaborate on the goals and intentions of the emerging speech act. For example, if someone wants to ask a question about a house, during macroplanning, the intention of a question will emerge with the central theme or concepts that will be spoken. At this level, the person does not need to know which language will be spoken and therefore, the proficiency in a language does not matter (Segalowitz, 2010). However, it does become relevant in the next step: microplanning. Contrary to macroplanning, microplanning is a language-specific process. It is during the microplanning phase that speakers transform those emerging utterances into propositional forms and, consequently, when someone speaks more than one language, this is where the language is chosen based on the context (de Bot, 1992). According to Segalowitz (2010), the choice of language appears at the same time as the choice of

registers, and people use socio-pragmatic clues to decide which language and which register they will use. Nonetheless, microplanning is not yet where words appear, because like macroplanning, microplanning is still a conceptual process (Segalowitz, 2010).

The concepts are transformed into a more specific message called preverbal message, which is a "conceptual structure that can be implemented in words but which has not yet been formulated in words" (Segalowitz, 2010, p.12). After emerging from the conceptualizer, the preverbal message is passed onto the *formulator*, which triggers lexical access and grammatical and phonological encoding. Bilingual or multilingual people have a formulator for each language (De Bot, 1992).

The last step of the speech production model is articulation, where the output from the formulator is translated into overt speech. According to de Bot, "there is only one articulator for bilingual speakers which has an extensive set of sounds and pitch patterns from both languages to work with" (de Bot, 1992, p.17), which means that when a communication problem appears in an L2, it will appear through articulation, although articulation itself is not always the problem: the problem takes its roots from a different level of the speech production process.

Finally, during the entire process, a monitoring mechanism helps speakers detect and repair erroneous elements in the emerging utterances. This monitoring mechanism is less accurate for people who speak an L2 than people who speak their L1 since they are not always aware of their error.

According to Segalowitz (2010), the macroplanning process acts similarly in the L1 and L2 because it occurs before any forms of language are elicited. Therefore, the roots of speech production problems cannot be traced back to the macroplanning level and "for this reason, language mastery level cannot impact how well macroplanning processes are carried out" (Segalowitz, p.10). Moreover, this step of the speech production process demands attention from both L1 and L2 speakers. Everyone must pay attention to what they want to say before they speak, even if it is in their L1 (Segalowitz, 2010). However, less advanced L2 learners' cognitive resources are more easily exhausted, which means there are fewer resources left for macroplanning.

With microplanning, which is the second part of the conceptualizer, the language is chosen. If people are speaking their L1, everything stays relatively simple, but if they speak their L2, some issues can occur. Segalowitz (2010) uses the example of someone wanting to describe a house with a tree on the left of the house. There are many ways to describe a situation like this (e.g. the house with the tree on the left, the tree with the house on the right, the oak with the yellow mansion on the right), and when people are speaking in their L2, they might "not know the lexical items needed for microplanning" (Segalowitz, 2010, p.12). On the other hand, L2 speakers might know the words, but it might take them longer to associate the words with the concepts. Finally, they might also pick the wrong word, as in a word that was wrongly associated with a concept.

Afterwards, once the grammatical encoding begins, it does not usually require attentional resources for L1 speakers, because these processes are fully automatized, but this is not the case for L2 speakers for whom these error-prone processes are still developing (Segalowitz, 2010). The notion of attention is essential here because it is the automation of these processes (grammatical encoding and morpho-phonological

encoding), which leads to fewer disfluencies in an L1, and thus, the focused-attention on those processes leads to more disfluencies in an L2. Therefore, L2 production requires attentional resources, and learners with greater attentional control have more efficient speech production processes, resulting in fewer disfluencies and self-repairs (Zuniga & Simard, 2018). In sum, while in a state of flow (which implies optimal attention use), learners' attention would flow seamlessly between these processes, potentially resulting in more fluency, accuracy and complexity. In this section, the interaction between the linguistic and cognitive processes involved in speech production have been illustrated. In the following section, the techniques used to measure the quality of that production will be presented to further illustrate the potential impacts of flow.

2.5 Speech production quality

The quality of speech production is usually measured through three main constructs: complexity, accuracy and fluency (CAF measures). Fluency is the capacity to speak without using hesitations, pauses or reformulations (Foster & Skehan, 1996). Accuracy is the "ability to avoid error in performance, possibly reflecting higher levels of control in the language" (Skehan & Foster, 1999, p.96). Complexity is the ability to achieve more advanced structures in a language (Skehan & Foster, 1999). These three characteristics of speech production are measured differently depending on the research (Foster, Tonkyn & Wigglesworth, 2000). Fluency can be measured by taking into account "reformulation, replacements, false starts, repetition, hesitation and pauses" (Foster & Skehan, 1996, p.310). In the same research, Foster and Skehan (1996) measured complexity with the numbers of clauses and the numbers of C-units to verify the syntactic variety in speech production. Note that C-units can be defined

as “an independent utterance providing referential or pragmatic meaning” (Foster & Skehan, 1996, p.305). Accuracy is measured by the numbers of error-free clauses divided by the total number of clauses.

These three measures are influenced by various factors: task complexity, planning, cognitive resources. Indeed, task complexity plays a significant role in the fluency, accuracy and complexity of speech. Robinson (2007) mentions that complex tasks lead to more accurate and complex but less fluent speech production. Indeed, the complexity of a task directs task-doers’ attentional resources and pushes them to focus on producing more complex and accurate speech, taxing the fluency of speech by doing so. In their research, Foster and Skehan (1996) were interested in the influence of planning in speech production. Pre-task planning leads to higher CAF measures scores, but online planning (while speaking) increases accuracy and decreases fluency. The only time planning does not help generate more accurate speech was when the students were doing decision-making tasks. On the other hand, planning did not help to generate more complexity in speech when the students were doing narrative tasks. Thus, the type of tasks also influences the quality of speech production. Finally, the cognitive resources needed for a task also play a role in fluency, accuracy and complexity: the more processing load decreases, the more these three measures will increase (Skehan & Foster, 1999). In sum, task complexity, planning and cognitive resources can all influence speech production.

2.6 Research questions

So far, the concept of flow was described, including how to measure flow levels by assessing the level of its four dimensions (skill-challenge balance, control, attention

and interest). The different research that used the concept of flow in SLA contexts was examined to illustrate that the majority of research has focused on the influence of tasks on flow (except Amini & al., 2016). Indeed, no research has looked at the potential beneficial impact that being in a state of flow could provide to a learner, but there are reasons to believe that such an impact could be present. For example, since flow represents an optimal learning experience (Csikszentmihalyi, 2008) that focuses all the learner's attention on a task, the state of flow should help learners produce more complex, accurate and fluent speech because those three measures demand attentional resources, especially when speaking an L2. Finally, since proficiency directly impacts speech production quality, this variable will be considered in this research. However, since flow is a subjective state of mind (Moneta & Csikszentmihalyi, 1996), it will be the self-perception of the proficiency of the participants that will be taken into account, that is self-assessed proficiency and perceived task-difficulty.

Based on the theoretical framework, the following questions arise:

1. Does self-assessed proficiency and perceived task-difficulty interact with flow intensity during an L2 narration task?
2. Does flow interact with speech production quality during an L2 narration task?

Fluency will logically increase with proficiency (as measured by self-assessement and perceived task-difficulty) because higher levels of proficiency mean more automatized processing and, thus, higher speech rate (De Bot, 1992). However, being proficient in a language does not necessarily assure that people experience flow. Indeed, some advanced learners might experience boredom if the task is too easy for their skills. Even though the perception of the task difficutly by the learners do not reflect the real level of task difficulty, in this case, the perception is more relevant than the actual task

difficulty. Therefore, the state of flow may be linked to fluency independent of proficiency because fluency requires efficient allocation of attentional resources to all the speech production processes just like flow does. When people are in a state of flow, according to the four dimensions, attention is optimally allocated to the production task; thus, one might expect increases in fluency. In other words, since proficiency affects fluency, these three variables (proficiency, flow and fluency) might affect each other. In summary, being in a state of flow, and thus, being entirely focused on a task, could play a decisive role in the level of fluency.

Complexity also increases with proficiency because as new skills are acquired in a language, more complexity will grow out of those new skills (Czimmermann & Piniel, 2016). Moreover, flow theory (Csikszentmihalyi, 2008) states that the positive state of flow encourages engagement and exploratory behaviour. To maintain a state of flow, learners have to adjust tasks so that they remain challenging, thus pushing them beyond actual competency levels and increasing linguistic complexity. Therefore, the level of flow might be expected to interact with complexity independently of proficiency. In other words, both proficiency and flow will help learners produce more complex speech, as calculated by the comparison of the number of clauses and the number of C-units, which will show syntactic varieties through speech.

Accuracy is an ability that reflects “higher levels of control in language” (Skehan & Foster, 1999, p.96). Therefore, accuracy tends to increase with proficiency (Kim & al., 2016) since the more knowledge people have of a language and the more automatized that knowledge is, the less likely they are to make errors when they speak that language. Considering that flow structures attention, one can argue that being in a state of flow would presumably increase the efficiency of pre-verbal planning (macroplanning and

microplanning), resulting in fewer errors and increased accuracy, and this, independent of proficiency.

After examining all three CAF measures, a trade-off effect between the speech production quality measures might be expected. Indeed, Skehan's (2009) trade-off hypothesis states that there are trade-offs between learners' speech production regarding complexity, accuracy and fluency: when one of the CAF measures increases, the other two measures will most likely decrease. Therefore, if the state of flow helps learners increase one of their CAF measures scores, it might also decrease another of their CAF measures scores. Then, it would be of merit to know if perceived proficiency plays a role when students are experiencing flow while engaged in a speech production task. Flow is a subjective experience, and the perceived level of proficiency might more influence it than by actual proficiency levels. We hypothesize that the more proficient the students will perceive themselves, the more they will produce accurate, complex and fluent speech. Moreover, we are not sure yet if students from different proficiencies in their L2 will all experience flow. Even if they experience it at every level of perceived proficiency, we do not know if they will experience it similarly in terms of the four dimensions of flow mentioned in 2.2.1.

In this research, we also hypothesize that flow will have a positive relationship with the quality of L2 speech production. Since flow involves using all of one's attentional resources on a specific task and that speech production in L2 is not fully automatized, we posit that a person experiencing flow will speak more fluently, more accurately and with more complexity than someone who is not experiencing a state of flow. However, according to the trade-off hypothesis (Skehan, 2009), we expect at least one of the CAF measures to not increase with the other CAF measures and possibly, decreases. These

quality measures have also been shown to be influenced by L2 proficiency (Skehan & Foster, 1999) because people more proficient in their L2 will logically be more fluent, more complex and more accurate when they speak in their L2. Therefore, this variable will also be considered in the next section.

CHAPTER III

METHODOLOGY

3.1 Introduction

The principal purpose of this research was to determine if there is a relationship between flow (including all four dimensions: skill/challenge balance, control, focused attention and interest), perceived proficiency level (measured by self-assessed proficiency and perceived task difficulty), and the quality of speech production (measured by CAF measures). In the following chapter, the methodology used during this study will be described, including the design (3.2), the variables (3.3), the participants (3.4), the measurement instruments (3.5), the procedure (3.6), the data organization and coding (3.7), the analysis (3.8) and a summary of the methodology.

3.2. Design

This study follows a one-shot design through which possible relationships between self-assessed proficiency, the state of flow, and the quality of speech production can be observed during an oral narration task performed by 35 speakers of English as an L2.

3.3 Variables

For this study, we examined interactions between three different variables: flow, proficiency and speech production quality. The flow variable was calculated using a flow perception questionnaire, which is divided into 5 data points: general flow score, skill-challenge balance, interest, attention and control. Proficiency was measured with two self-assessed items: self-assessed proficiency, which was calculated through a self-assessment questionnaire and is represented by a score between 1 (beginner) and 6 (post-advanced); perceived task-difficulty was measured with two items integrated into the task-related flow questionnaire. Finally, speech production quality was calculated using complexity, accuracy and fluency (CAF) measures.

3.4 Participants

A total of 39 university undergraduate students of sociology and political science at a francophone university in Montreal participated in the study. The group of participants consisted of 26 women and 13 men between the ages of 20 and 67. A total of 35 participants were speakers of English L2 and French L1. The other 10% (*n*= 4) had a different L1 (Khmer, Arabic, Haitian Creole), with French as an L2 and English as an L3. French was the main language spoken at home for 90% of the participants (*n*= 35), while English (5%) and Khmer (5%) were spoken at home by a total of 4 participants.

Concerning the self-assessed proficiency, 74% of participants (*n*= 29) considered themselves as being between post-intermediate (4) to post-advanced (6) in English, whereas 10 participants (26%) considered themselves as being between post-beginners (2) and intermediate (3) in English. No participants considered themselves as being

beginners (1). Amongst the participants, a total of 38% (*n*= 15) reported using English either at home, with their friends or at work, while 61.5% reported not using English in their daily lives. Participation in this research was voluntary; participants received a monetary compensation of $10 upon its completion.

3.5 Measurement instruments

Three different measurement instruments were used in this research: a socio-demographic questionnaire (3.5.1), which included a self-assessed proficiency item, a speech production task (3.5.2) and a flow questionnaire, which included two items measuring task-difficulty (3.5.3). A summary of the measurement instruments is presented in Table 3.1.

3.5.1 Socio-demographic questionnaire

A questionnaire (Appendix A) was used to collect information about the demographic and linguistic background of the participants. This questionnaire included items on participant's L1 and L2, languages spoken at home and with friends, age and gender. The last part of this questionnaire included a self-assessed proficiency test, in which we asked the participants to indicate their perceived level of English according to 6 categories based on the Common European Framework of Reference for Languages: beginner (1), post-beginner (2), intermediate (3), post-intermediate (4), advanced (5), and post-advanced (6) (see Council of Europe, 2001). The levels came with descriptions that let the participants decide which level best described them.

3.5.2 Speech production task

A picture narration task was used to obtain speech production data. Such tasks have been used in other studies (e.g. Foster & Skehan, 1996; Gilabert, 2007; Zuniga & Simard, 2018) because they elicit participants' creativity while allowing them to have control over the outcomes of the task. Such tasks also allow researchers to control for variation in task complexity and production content, allowing for a more precise comparison of participants' performance. The visual support used for the task consisted of a comic strip excerpt from Lucky Luke's Doc Doxey's Elixir (see Appendix B). A total of 40 images told the story of two crooked road merchants who trick people from a town into buying a fake elixir that will supposedly make them feel better. When the villagers realize that they have been deceived, they are upset, and the dishonest merchants leave town. The text was removed from the comic strip so as not to give any linguistic cues to the participants. The rationale behind the choice of this specific narrative was that the storyline is easy to follow, and the climax and resolution are explicit, allowing participants to focus on production through reduced demand on attentional resources at the macroplanning level. By reducing such demand associated with the conceptualization level of L2 speech production, picture-cue narration tasks free up cognitive resources for the morphological formulation processes, offering a clearer picture of learners' linguistic performance (Simard, French & Zuniga, 2017).

3.5.3 Flow perception questionnaire

Flow data was collected using a flow perception questionnaire adapted from Egbert's (2003) learners' perceptions questionnaire and Cho's (2018) skill-challenge balance questions. The reason why Egbert's version of the flow perception questionnaire was

adapted is because it was lacking the skill-challenge balance questions that Cho (2018) had included. Therefore, with the addition of the questions related to the difficulty of the task, this version of the flow perception questionnaire gives more accurate and complete flow scores. Furthermore, these additional questions allowed an additional variable of perceived proficiency to be added to the self-assessed proficiency measure that was collected in the socio-demographic questionnaire. The flow perception questionnaire (see Appendix C) has 16 Likert-scale items (from 1, strongly disagree to 7, strongly agree) that are linked to the four dimensions of flow: attention, interest, control, and skill-challenge balance. For example, "I would do this task even if it were not required" indicates the students' level of interest in the task. "It took no effort to keep my mind on task" underlines the focus of attention during the task. "This task allowed me to control what I was doing" highlights the control dimension, and "This task was difficult" determines the skill-challenge balance. The perceived task-difficulty, which is one of the perceived proficiency variable, is measured with the answers of these skill-challenge balance questions. A total of eight questions were related to interest, three were related to control, two were related to the skill-challenge balance, and finally, three were related to concentration. The internal consistency of Egbert's (2003) scale (Cronbach's *a, r*= .82) has been validated by numerous studies (e.g., Czimmermann & Piniel, 2016; Cho, 2018; Zuniga & Rueb, 2018). Cho's (2018) reported acceptable internal consistency for the skill-challenge balance items integrated into the study's flow scale (Cronbach's *a* above 0.80 in every study).

Table 3.1 Summary of the measurement tools

Tool	Purpose
Socio-demographic questionnaire	Socio-demographic information and self-assessed level of proficiency
Speech production task	Sample of L2 speech production to evaluate the quality
Flow perception questionnaire	Level of flow during the speech production task and the perceived task difficulty

3.6 Procedure

In the following section, the procedure for data collection[1] is explained. The procedure includes the preparation (3.6.1), the initial greeting (3.6.2), the consent form (3.6.3), the socio-demographic questionnaire (3.6.4), the speech production task (3.6.5) and the flow perception questionnaire (3.6.6).

[1] Please note that this data collection is part of a larger research project on the role of flow, emotions and the quality of speech production with Michael Zuniga and Daphnée Simard.

3.6.1 Preparation for the data collection

The researchers initially contacted teachers in the Departments of Sociology and Political Science at the university to recruit participants in their classes. After a brief presentation of the study, interested students were asked to write down their names and e-mails addresses on a contact information sheet. They were then contacted and asked for their availabilities, which we used to establish a visit calendar. All the participants were met individually in a reserved room at the university. A do-not-disturb sign was put on the door of the laboratory to avoid possible interruptions. The laboratory had photocopies of the protocols, instructions and measurement instruments. The comic strip used for the speech production task was printed in colour on large cardboard supports.

3.6.2 Initial greeting

Each participant was met individually in the laboratory, and the researcher started by welcoming them and thanking them for accepting to be a part of the study while engaging in casual conversation to lower possible anxiety related to the study. The participants interacted in French during the whole data collection, except for the picture-narration task, where they had to speak English.

3.6.3 Consent form

The participants were invited to read and sign the consent form (Appendix D). The researcher also verbally summarized the consent form and asked participants if they had any questions before beginning the procedure.

3.6.4 Socio-demographic questionnaire

The participants were asked to complete the socio-demographic questionnaire (Appendix A). The researcher was available to respond to participants' questions.

3.6.5 Speech production task

Following the completion of the socio-demographic questionnaire, the participants were invited to record a 4- to 5-minute narration based on the task described in section 3.4.2. We followed the protocol outlined in Zuniga and Simard (2018).

The researcher read the following instructions for the task:

> *« En regardant les images sur le carton devant vous, vous allez devoir raconter l'histoire illustrée dans les images en anglais pendant 4 à 5 minutes. Vous avez 2 minutes pour vous préparer. Vous pouvez prendre quelques notes pendant la planification sur la feuille que je vous donne à cet effet, mais vous n'aurez pas le droit de les regarder pendant que vous racontez l'histoire ».*

Then, the researcher verified the comprehension of the task instructions before presenting the visual support and initiating the two-minute planning phase. During this pre-task planning phase, the participants were allowed to look at the pictures and take notes. Pre-task planning allows learners to familiarize themselves with the task, and therefore produce more complex speech (Skehan, 2009). By letting the participants familiarize themselves with the story before asking them to speak, we allowed them to build the storyline and, thus, to go through the microplanning and macroplanning phases. Therefore, during the task, this allowed the participants to focus their attention on the formulator and articulator processes. Once the 2-minute period was over, the researcher took the notes from the participants. The researcher then reminded the participants that they had to tell the story within approximately 3 to 5 minutes. During the recording, the researcher had minimal interaction with the participants. The participants were still allowed to look at the pictures. The whole narration was audio recorded.

3.6.6 Flow perception questionnaire

Immediately following the elicited narration task, the participants completed the flow perception questionnaire. The researcher did not give any detailed explanation and asked the participants to answer the 16 questions, which covered both sides of a sheet of paper. The researcher read the following instructions for the task:

« *Maintenant que vous avez complété cet exercice de production orale en anglais, vous allez devoir remplir ce formulaire. Ce formulaire porte sur la façon dont vous vous êtes senti pendant que vous faisiez la tâche de production orale en anglais. Le*

formulaire est recto verso et si vous avez des questions sur les questions, n'hésitez pas. »

3.6.7 Conclusion

Finally, the researcher asked the participants to sign the receipt for the ten-dollar compensation and gave the money to the participants. Table 3.2 offers an overview of the data collection procedures with completion times.

Table 3.2 Summary of the procedure with approximate times

Step	Tool	Time
Welcome	Casual conversation	3 min.
Consent	Consent form	5 min.
Socio-demographic and self-assessed proficiency information	Questionnaire	5 min.
Speech production (preparation)	Comic strip	2 min.
Speech production (task)	Comis strip	5 min.
Flow data	Flow perception questionnaire	5 min.
Conclusion	Monetary compensation	5 min.
Total:		30 min.

3.7 Data organization and coding

In this section, the data organization and coding of every measurement instrument are presented. All the results from the socio-demographic questionnaire, the speech production quality measures (CAF measures) and the flow perception questionnaire were put in an Excel spreadsheet with the participants' numbers on the horizontal axis and the data on the vertical axis.

3.7.1 Socio-demographic and the self-assessed proficiency data

First, the languages spoken by the participants were counted and indexed in the first four columns of the excel spreadsheet. It was followed by an account of the languages spoken at home and with friends. The next columns contained age and gender data.

Finally, the level of self-assesed proficiency in English was indexed with the following code: beginner (1), post-beginner (2), intermediate (3), post-intermediate (4), advanced (5), post-advanced (6).

3.7.2 Speech production quality measures

The main purpose of the speech production task was to evaluate the students' speech production quality. The narrations were transcribed by a researcher and verified by a different assistant. The transcriptions started after the 20th second of each recording to leave a warm-up period (Simard, Fortier and Zuniga, 2011) and they were cut off after 2 minutes to have the same sample lengths for every participant. Four participants produced recordings that were shorter than two minutes and were therefore eliminated

from the study. The transcriptions of the recordings were used to calculate the CAF measures used to determine speech production quality. We based our measurements on Skehan and Foster's research (1996, 1997, 1999).

Complexity was measured by "dividing the number of clauses by the number of C-units" (Skehan & Foster, 1999). C-units were defined as "utterances, for example, words, phrases and sentences, grammatical and ungrammatical, which provide referential or pragmatic meaning" (Pica et al. 1989, cited in Foster & al., 2000, p.358). The researcher first identified all the C-units by reading the transcription of speech production and dividing all the utterances that provided different ideas. For example, in the following excerpt, there are two C-units:

"so clearly he's feeling way better /euh/ because of the substance that he just took from the seller // so everybody's kind of impress."

The first one starts at the beginning and ends with "*the seller*" and the second one is "*so everybody's kind of impress*". Once the speech's written transcriptions were all divided into C-units, the C-units were then divided into clauses. C-units that included subordinate conjunctions (e.g. after, because, unless, that) were divided whereas C-units without subordinate conjunctions remained as one clause. If we take the example above, these two C-units were divided into four clauses: 1- "*so clearly he's feeling way better",* 2- "*because of the substance*", 3- "*that he just took from the seller*", 4- "*so everybody's kind of impress*". Once all the C-units were divided into clauses, we divided the number of clauses by the number of C-units to obtain the complexity score. Thus, the lowest possible complexity score would be 1, that is, one clause for every C-unit. For example, a participant producing 24 C-units and 27 clauses would have a total

score of 1.125. Essentially, the higher ratios of subordination indicate greater complexity.

Accuracy was "measured by calculating the number of error-free clauses as a percentage of the total number of clauses" (Skehan & Foster, 1999). Accordingly, the transcriptions were previously divided into clauses. Those clauses were then analyzed to identify errors. Morpho-syntactic errors were taken into account and underlined by the researchers. Then, the number of error-free clauses was divided by the total number of clauses, providing a score between 0 and 1. The closer a participant is to 1, the more accurate his or her speech production was, with 1 indicating perfect error-free production.

Since fluency is more complicated to calculate than accuracy and complexity, it was measured with five different measures: the number of words per minute, the number of pauses per minute and other disfluencies measures such as the number of repetitions, false starts and reformulations (Skehan & Foster, 1999). In this research, the number of words per minute does not include repetitions because they are not considered as a sign of fluency (Griggs, 1997). Every word of the 2-minute transcript was counted by the researcher and then divided by two to calculate the number of words per minute. Then, a pause was defined as a moment of uninterrupted silence or the use of a sound to fill this silence during speech production. The length of the pauses was not taken into account; thus, only the frequency of the pauses was considered. The pauses were all noted in the 2-minute transcription excerpt by "//" or by a stalling sound like "/euh/". For example: *"[…] was making a lot of money out of it // but /euh/ it also appears that […]"*. In this excerpt, the "//" represents the first pause, and the "/euh/" represents a second pause in the sentence.

Finally, the number of repetitions was operationalized as the number of utterances in which words or phrases were repeated without making any changes to the initial utterance. If any changes were made, it was considered as a reformulation. As for false-starts, they were defined as "an utterance which is begun and then either abandoned altogether or reformulated in some way" (Foster & al., 2000, p.368).

3.7.2 Flow perception questionnaire

Flow scores (flow ratio) were calculated by Egbert's (2003) method. At first, each dimension was calculated individually using the score from each item that was related to their dimensions. Negative items were reverse coded. Interest was calculated with questions 1, 2, 6, 7, 8, 11, 15; control, with questions 3, 9 and 12; and concentration with questions 5, 10 and 13. All the dimensions' scores were added together to obtain the general flow score, for a maximum score of 84, and then divided by 84. The score was then multiplied by 100 to form a comparable ratio.

The skill-challenge balance score was calculated separately from the general flow score because its calculation depends on the counterbalancing of two items (4 and 16). Question 4 indicates whether the task was too easy, and question 16 whether the task was too difficult. To create an index of skill-challenge balance, we subtracted item 16 (this task was too hard) from item 4 (this task was too easy), which gave us a scale from -5 (task is too difficult) to 5 (task is too easy). Since the importance here is the balance, with a score of 0 indicating a perfect balance, scores that are equidistant from 0 have the same value (e.g. 1 and -1 are both at the same level of balance even if 1 means it was easier and -1 means it was more difficult). Then, we created the following

SCB equivalence table in order to have the SCB score on a linear scale from 0 (not balanced) to 5 (fully balanced).

Table 3.3 Skill-challenge balance equivalence

SCB Score *too difficult	SCB Score *too easy	SCB adjusted score
0	0	5
-1	1	4
-2	2	3
-3	3	2
-4	4	1
-5	5	0

Moreover, since these two questions of the flow questionnaire measured the participants' perception of task-difficutly, the results from these two questions were also used to assess perceived task-difficulty.

3.8 Analysis

The data was entered into an Excel spreadsheet. Four of the participants' speech recordings were shorter than two minutes, and thus, these participants were removed from the study. Afterwards, to find answers to the research questions, the data were prepared for statistical analysis with SPSS software. First, descriptive statistics were calculated to obtain an overall picture of the data, including the means, the standard

deviation, the minimum and maximum scores for the following variables: age, level of perceived proficiency (calculated by the self-assessed proficiency question and with the two questions on task difficulty in the flow perception questionnaire), flow (including interest, control, attention and skill-challenge balance), and the CAF measures (including level of complexity, level of accuracy, number of words/minute, number of pauses/minute, reformulations and repetitions).

Afterwards, the skewness and kurtosis ratio were calculated to verify the distribution of the data. By doing this, we realized that some variables (e.g. general level of flow, interest, complexity, accuracy) did not meet the assumptions necessary to use parametric statistical tests. Therefore, non-parametric statistical tests (Spearman correlation test) were used to determine the links between the different variables. Spearman correlation tests were also used because they allow for correlations between continuous and ordinal data (self-assessed proficiency). Moreover, correlation analyses were used to determine relationships between self-assessed proficiency and flow intensity for the first question, and then, for the second question, between flow intensity and speech production quality.

Finally, to examine the data from another angle, participants were divided into a low-flow group composed of the bottom 30% of flow scores (n= 12) and a high-flow group composed of the top 30% (n= 12) whose members had below-average scores. Mann-Whitney U test tests were used to determine the significance of between-group differences.

Table 3.4 Summary of the methodology

Research questions	1. Does perceived proficiency interact with the flow intensity experienced during an L2 narration task? 2. Does flow interact with speech production quality during an L2 narration task?
Experimental plan	One-shot study
Variables	1. Level of flow 2. Speech production quality 3. Perceived proficiency (self-assessed proficiency and perceived task difficulty)
Participants	39 university undergraduate students of sociology and political science at a French-Canadian university with English as a second language
Measures	1. Flow = Flow perception questionnaire 2. Speech production quality = CAF measures 3. Perceived proficiency = self-assessed proficiency

CHAPTER IV

RESULTS

4.1. Introduction

In this chapter, the results and analyses will be presented in order to find an answer to both research questions presented in 2.6. First, descriptive statistics and distribution data will be presented for each variable (perceived proficiency, flow and CAF measures) (4.2). Then, correlation results will be described to find links between the variables in the research questions (4.3). Finally, to offer a more nuanced picture of the results, speech production quality will be examined in both high-flow and low-flow groups of participants (4.4).

4.2 Descriptive statistics

In this section, the descriptive data of each variable will be presented. First, the perceived proficiency (4.2.1) and flow data (4.2.2) will be examined before presenting the quality of speech production data, that are the CAF measures (4.2.3). Finally, each variable will be tested for normality of distribution.

4.2.1 Proficiency

This section provides a descriptive analysis of the results that were collected from the self-assessed proficiency test and the perceived task difficulty variable. First, the distribution data will be presented (4.2.1.1), followed by the means and standard deviation (4.2.1.2)

4.2.1.1 Distribution of perceived proficiency data

Table 4.1 presents the skewness and kurtosis statistics for perceived proficiency.

Table 4.1 Distribution of perceived proficiency data

Data	Skewness (SE= 0.398)	Skewness Ratio	Kurtosis (SE =0.778)	Kurtosis Ratio
Self-assessed proficiency	-0.180	-0.452	-0.477	-0.613
Perceived task difficulty	0.594	1.492	-0.296	-0.380

This table shows that the self-assessed proficiency distribution is negatively skewed and also has a negative kurtosis ratio. As for the perceived task-difficulty, it is positively skewed with a negative kurtosis ratio. According to Larson-Hall (2010), skewness and kurtosis ratios between -2 and 2 are considered normal. Therefore, since

the skewness ratio (z = -0.452 and 1.492) and the Kurtosis ratio (z = -0.613 and -0.380) are between -2 and 2, the data meets normal distribution assumptions necessary for parametric statistical tests.

4.2.1.2 Means and standard deviations for perceived proficiency data

In table 4.2, the minimum, maximum, means and standard deviations for perceived proficiency are presented.

Table 4.2 Descriptive data for perceived proficiency

Data	Minimum	Maximum	Mean	Std. Deviation
Self-assessed Proficiency	2	6	4.09	1.01
Perceived task difficulty	2	12	5.60	2.56

The table shows that no participants considered themselves to be beginners (1) and that the range of perceived proficiency level varied between post-beginners (2) and post-advanced (6). Only two participants (6%) considered themselves as post beginners, and only two participants (6%) considered themselves as post-advanced, which means that the majority of participants (88%) scored between 3 (intermediate) and 5 (advanced). The frequency of perceived proficiency can be observed in Figure 4.1. As for the perceived task difficulty, the minimum and maximum of 2 and 12 show us that some participants found the task very difficult, whereas others found it very easy. However, on average (M= 5.60), participants found the task not too difficult, nor too easy.

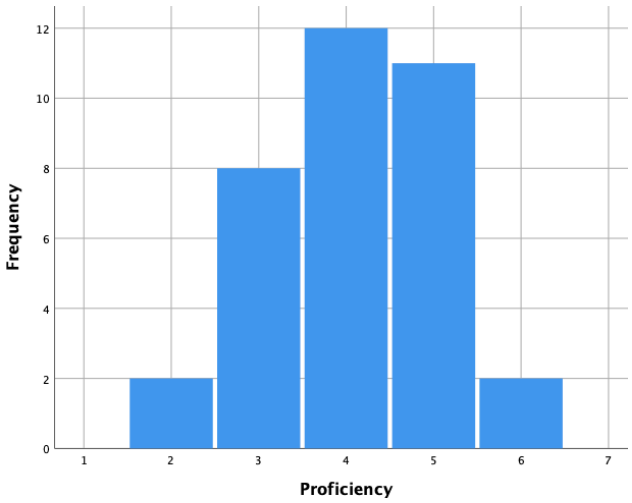

Figure 4.1 Frequency of self-assessed proficiency

4.2.2 Flow data

In this section, the flow data, including the general flow score, interest, control, attention and skill-challenge balance (SCB) scores, will be described.

4.2.2.1 Distribution of flow data

Table 4.3 presents the results of the skewness and the kurtosis of all the flow dimensions.

Table 4.3 Distribution of flow data

Data	Skewness (SE= 0.398)	Skewness Ratio	Kurtosis (SE= 0.778)	Kurtosis Ratio
General flow	-0.956	-2.40	1.123	1.44
• Interest	-1.242	-3.12	2.586	3.32
• Control	-0.448	-1.13	-0.446	-0.57
• Attention	-0.281	-0.71	-1.022	-1.31
SCB	-0.035	-0.09	-1.155	-1.48

This table shows that the dimensions of control, attention and SCB, were all normally distributed, with slightly negative skews and low peaks. The general flow data was characterized by a moderately strong peak (z = 1.44) and a strong negative skew (z = -2.40), which indicates a concentration of high-end flow scores. Interest was also characterized by a strong peak (z = 3.32) and negative skew (z = -3.12). Participants expressed high flow and interest in the activity with relatively low variability.

4.2.2.2 Means and standard deviations for flow data

In table 4.4, the minimum, maximum, means and standard deviations for flow are presented.

Table 4.4 Descriptive data for flow

Data	Minimum	Maximum	Mean	Std. Deviation
General flow	51.19	95.24	79.59	10.33
• Interest	37.50	100.00	81.85	13.23
• Control	33.33	100.00	70.63	16.31
• Attention	61.11	100.00	82.54	12.06
SCB	0	5	2.64	1.58

This table shows that the average level of general flow during the task was high (79.59), and the relatively small standard deviation (10.33) reconfirms the low flow score variability reported in the previous section. Based on the average flow score of 69.1 observed in Zuniga and Rueb (2018) for 424 participants completing 25 L2 learning activities, the task used in the present study would be considered high flow generating. Since the average levels of interest (81.85) and attention (82.54) were higher than the average of general flow, they were dimensions that helped to create a higher flow score, whereas the dimension of control brought down the general flow score. Finally, the SCB dimension seems to be the dimension that was the least experienced by the participants (average of 2.64), which means that the participants found the task to be either too easy or too difficult for their perceived skills. In this case here, a score of 5 would mean that the participants felt like their skills were perfectly balanced with the challenge of the task, and a score of 0 would mean that it was too easy or too difficult.

4.2.3 Speech production data

In this section, the speech production data will be described.

4.2.3.1 Distribution of speech production data

Table 4.5 presents the results of the skewness and kurtosis of the different measures of speech production quality.

Table 4.5 Distribution of speech production data

Data	Skewness (SE= 0.398)	Skewness Ratio	Kurtosis (SE= 0.778)	Kurtosis Ratio
Complexity	1.577	3.96	3.452	4.44
Accuracy	-1.415	-3.56	1.742	2.24
Fluency	-	-	-	-
• Words/Minute	-0.236	-0.59	0.775	1.00
• Pauses/Minute	0.715	1.80	1.189	1.53
• Reformulations	1.822	4.58	4.780	6.14
• Repetitions	1.256	3.16	1.091	1.40

The data shows that only words per minute (z = -0.59) and pauses per minute (z = 1.80) are normally distributed, and are thus suitable for parametric tests. The other variables (complexity, accuracy, reformulations and repetitions) are not normally distributed.

Complexity (z = 3.96), reformulations (z = 4.58) and repetitions (z = 3.16) were strongly positively skewed whereas accuracy was strongly negatively skewed (z = -3.56). Furthermore, since these variables are not normally distributed, non-parametric tests will be used for those measurements.

4.2.3.2 Mean and standard deviations for speech production data

In table 4.6, the minimum, maximum, means and standard deviations for the speech production measures are presented.

Table 4.6 Descriptive data for speech production measures

Data	Minimum	Maximum	Mean	Standard Deviation
Complexity	1.00	1.73	1.19	0.15
Accuracy	0.17	1.00	0.73	0.20
Fluency	-	-	-	-
• Words/Minute	30.00	179.50	116.30	31.91
• Pauses/Minute	17.00	47.00	27.53	6.30
• Reformulations	0.00	10.00	1.89	2.14
• Repetitions	0.00	26.00	6.71	6.72

The average participant got a score of 1.19 in complexity, which means that, on average, 19% of the clauses had subordinate clauses, which made the sentences more

complex. As for accuracy, the average of 0.73 means that, on average, 73% of all the clauses were error-free. The average number of words per minute was 116.30, and the average number of pauses per minute was 27.53. The average number of reformulations was 1.89, and the average number of repetitions was 6.71, which means that, on average, during the 2-minute section that was used for data transcription, participants produced 1.89 reformulations and 6.71 repetitions.

4.3 Correlation tests

In this section, the correlation analysis that was used to determine relationships between self-assessed proficiency, perceived task-difficulty, flow and speech production quality will be presented.

4.3.1 Correlation analysis between flow and proficiency

A Spearman correlation test was run between all the flow data (including the four dimensions) and the self-assessed proficiency (SAP) and perceived task-difficulty (PTD) data. Since interest and general flow were not normally distributed, and since the self-assessed proficiency data were ordinal, a non-parametric test was used.

Table 4.7 Correlation between flow and SAP

	SAP	Flow	Control	Interest	Attention	SCB
SAP	-	0.064	0.176	-0.178	0.223	0.083

*p = < 0.05 (1-tailed), **p = < 0.01 (1-tailed)

Table 4.7 shows that perceived proficiency and flow are not correlated (p= 0.357). However, a moderate positive trend between perceived proficiency and attention (r(34)=0.223, p= 0.099) can be observed. This suggests that as perceived proficiency increased, learners were slightly more focused on the task.

PTD is the sum of answers from question 4 (reverse-coded) and 16, which is presented on a scale from difficult to easy. Therefore, a score of 100% would mean the task was too easy for the participant. In the following table the results of the Pearson correlation analysis between PTD and SAP, control, attention, and general level of flow are presented.

Table 4.8 Correlation between PTD, perceived proficiency, control and attention

	PTD	Flow	SAP	Control	Attention
PTD	-	0.235	0.480**	0.447**	0.301*

*p = < 0.05 (1-tailed), ** p = < 0.01 (1-tailed)

This table shows that the level of PTD is correlated with SAP (r(34)=0.480, *p*= 0.002), control (r(34)=0.447, *p*= 0.004) and attention (r(34)=0.301, *p*= 0.039). With control and attention, this means that the easier they perceived the task the more they felt in control and were focused. As for the general level of flow, there is no correlation, but a modest trend between this variable and the variable of perceived difficulty (r(34)=0.235, *p*= 0.087) can be observed.

Since interest was not normally distributed, a non-parametric test was used for this dimension. The results show that interest is not correlated to the PTD of the participants (r(34)=-0.179, *p*= 0.152).

In this section, an analysis to answer the first research question was presented. After running a one-tailed Spearman correlation analysis between the variable of self-assessed proficiency with the general level of flow and its dimensions, no clear correlations were found. However, the correlation tests between the PTD and flow suggest that two flow dimensions (control and attention) are positively correlated with the PTD, and a trend was observed between general flow and the PTD variable.

4.3.2 Correlation between flow and speech production quality

The second research question concerned the relationship between flow and speech production quality. A Spearman correlation test was done between flow, including all the dimensions, and the speech production quality measures (CAF measures). The results of this correlation test are presented in Table 4.9.

Table 4.9 Correlation between flow and speech production quality

	Flow	Control	Interest	Attention	SCB
Complexity	-0.295*	-0.003	-0.480**	0.011	0.005
Accuracy	0.158	0.163	0.056	0.129	0.201
Words/Minute	0.081	0.151	-0.072	0.185	0.381*
Pause/Minute	-0.018	-0.015	-0.068	0.181	-0.037
Reformulations	0.211	0.314*	0.045	0.189	0.139
Repetition	-0.195	-0.121	-0.197	-0.151	-0.187

*p = < 0.05 (1-tailed), ** p = < 0.01 (1-tailed)

This table shows that the general level of flow is negatively correlated with the complexity of speech (r(34)=--0.295, *p*= 0.042), but not with any of the other CAF measures. It means that the more participants were in a state of flow, the less complex their speech production was.

As for the four dimensions of flow, we can observe that the dimension of control is correlated with the number of reformulations (r(34)=-0.314, *p*= 0.033), which is a fluency measure. This positive correlation means that the more participants felt in control, the more reformulations they produced. Perhaps this feeling of control pushes participants to want to reformulate some words, phrases or sentences, perhaps to send a more accurate message.

As for the dimension of interest, it is negatively correlated with the complexity of speech (r(34)= -0.480, *p*= 0.002), which means that the participants who were the most interested in the task were the ones who produced less complex speech production. Finally, the last correlation in this table is between the SCB and the number of words per minute (r(34)= 0.381, *p*= 0.012). The more participants perceived a balance between their skills and the demands of the task balanced (SCB), the more words they were able to produce per minute.

In conclusion, these findings suggest that as flow and interest increase, the complexity of speech decreases. Moreover, as the feeling of control increases, the number of reformulations also increases. Finally, fluency increased when participants felt more balance between their skills and the challenge presented by the task.

4.4. Low-flow and high-flow group differences

The lack of significance in the correlation tests may be the result of the low variability (*z*= 1.44) and the strong negative skew (*z*= -2.40) characterized in the participants' flow scores. Therefore, we attempted to have a more nuanced look at the impact of flow on speech production quality by creating a low-flow group composed of the bottom 30% of flow scores (*n*= 12) and a high-flow group composed of the top 30% (*n*= 12). The creation of these groups allowed a better comparason between distinct flow groups. These data are presented in Table 4.10. One-tailed Mann-Whitney U-tests were conducted to determine which group differences were statistically different.

Table 4.10 Mean speech production quality according (low and high flow groups)

Measure	Low Flow Means	High Flow Means	% Difference
General Flow	69.1	89.4	+29%**
Complexity	1.14	1.08	-7%*
Accuracy	.69	.76	+10%
Words per minute	114.6	124.1	+8%
Pauses per minute	26.9	28.5	+6%
Reformulations	1.3	3.0	+130%
Repetitions	6.9	4.5	-35%

Note. *$p < .05$. ** $p < .01$.

The results presented in Table 4.10 reveal that the two groups were statistically distinct regarding the flow score. Indeed, the high-flow group (M = 89.4) experienced about 30% more flow than the low-flow group (M = 69.1), U(24)= .000, Z = -4.168, $p = .000$. With regard to complexity, the high-flow group's production was about 7% less complex (M = 1.08) than that of the low-flow group (M = 1.14), U(24) = 30.0, Z = -1.906, $p = .05$. Interestingly, the production of the high-flow group was 10% more accurate, contained about 8% more words per minute, 6% more pauses and 130% more reformulation than the low-flow group. Finally, the high-flow group produced about 35% fewer repetitions in their narrations (M = 4.5) than the low flow group (M = 6.9). A series of Mann Whitney Tests indicate, however, that these last five differences were not statistically significant. It is, however, interesting to point out that all the means trend in the direction that can be explained by our hypotheses, which suggests that the

same underlying cognitive processes govern flow and speech production quality. It is possible that, with a larger sample size and greater variability in the flow data, significant differences may emerge.

CHAPTER V

DISCUSSION

5.1 Introduction

The main goals of this research was to determine if perceived proficiency interact with flow intensity as well as if being in a state of flow would interact with speech production quality during an L2 picture narration task, and if so, to what extent. We know that flow is a positive state of mind that helps people live optimal experiences in many fields, but we did not know if and how flow interacts with L2 performance, specifically in the oral modality. Moreover, we looked at the perception of proficiency and flow states. Since our sample of participants was composed of adults who had English as an L2, perceived proficiency would naturally vary, especially since the participants were not part of an intact language class with a specific language level.

To answer our research questions, we asked 39 participants to assess their perceived proficiency using a scale from 1 to 6 with a description of all the levels (Council of Europe, 2003). Then, the participants completed a picture-narration task immediately followed by a flow-perception questionnaire, which included two questions that measured the task-difficulty perception. The picture-narration task was recorded, transcribed, and all the CAF measures were calculated to score each participant's

speech production quality. The level of flow and the level of each of the four dimensions were calculated for each participant with the flow perception questionnaire.

In this chapter, the results of this research will be discussed in relation to previous research. At first, question one will be discussed (5.1.1), then question two will be discussed (5.1.2). Afterwards, the research limitations (5.2) and future directions (5.3) will be discussed.

5.1.1 Question one: Perceived proficiency and flow

The first question was the following: Does self-assessed proficiency and perceived task-difficulty interact with flow intensity during an L2 narration task? The results, which were presented in chapter four, demonstrate that there is no direct correlation between participants' self-assessed proficiency and their flow experience during a picture-narration task. A different picture emerged when we examined perceived task difficulty measured with two questions from the flow perception questionnaire.

At first, correlation tests were conducted, and it was determined that no correlation existed between flow and self-assessed proficiency. Afterwards, we ran correlation tests between self-assessed proficiency and each dimension of flow (control, attention, SCB and interest), and again no significant correlations were found. However, we observed a modest trend between attention and self-assessed proficiency, which suggests that participants with higher level of self-assessed proficiency seem to focus slightly more on the task. Perhaps this higher perceived proficiency allowed them to allocate more attention to the task. Indeed, participants with higher self-assessed proficiency have more automatized speech production processes than the participants

with lower self-assessed proficiency (Segalowitz, 2010), which allows the former to focus more on the task and less on formal aspects of language. On the other hand, participants with lower self-assessed proficiency found the task more difficult, which might have been the result of an overload of cognitive resources, which can open participants up to distractions and attention-robbing negative emotions such as anxiety.

To try to obtain a different picture of how perceived proficiency might play a role in L2 speech production performance and flow, the perceived task difficulty was taken into account, which was positively correlated with control, attention and perceived proficiency. This finding suggests that the easier the task was perceived to be, the more the participants felt in control and the more they focused their attention on the task. In terms of control, this means that the easier the task is perceived, the more people experience a sense of control in achieving that task. If, however, the task is perceived as too hard, it is difficult to grasp a sense of control over the outcomes of the task. For the attention dimension, this finding suggests that the easier the task was perceived, the more focused the participants were. This can be linked to the trend that was mentioned in the previous paragraph: the more proficient participants were, the easier they found the task and, therefore, the more focused they were while doing the task. Accordingly, the people who found the task to be more challenging also had a harder time focusing on it as a result of distractions related to cognitive overload. Finally, the last correlation found was between perceived proficiency and perceived task difficulty, which means that the more proficient participants were, the easier they found the task. Since the perceived level of difficulty and the self-assessed proficiency level are correlated, we might assume that the perceived level of difficulty is also a self-assessed proficiency measure. Asking all the participants about the difficulty of a task put them on a task-related proficiency scale: participants who found the task easier are assumed to be more

proficient in doing this specific task and participants who found the task more difficult are less proficient in this specific situation.

Our results appear to offer support for the first question: perceived proficiency does seem to play a role in the flow experience. Here, the concept of perceived task difficulty can also be understood as a measure of perceived proficiency in the context of an L2 picture narration task. We used a self-assessed proficiency test, but as previously mentioned, asking two questions on the perceived difficulty of the task was also a way to understand the perceived proficiency level of the participants. Therefore, two of the dimensions of flow are related to the perceived proficiency level of the participants: control and attention.

Previous research has shown that while reading in their L2, students with higher proficiency experienced flow more often than students with lower proficiency in their L2 (McQuillan and Conde, 1996). Even if reading and speaking are different modalities, we can observe a similarity between our results. In our research, we found evidence of a link between flow and L2 perceived proficiency in the oral modality measured by the perception of the task difficulty. On the other hand, we only had 35 participants, and none of them considered themselves as being beginners. Indeed, the least proficient participants considered themselves as being post-beginners, and there were only two of them (6% of the sample) who were in that category. The results might have been different had there been a broader range of perceived proficiency levels.

Another study that did not expressly look at proficiency, but which can offer insight and context regarding our results, is Czimmermann and Piniel (2016), who found that university students experienced more flow in L2 classrooms than high school students.

While proficiency results were not presented in their study, one might imagine that the university students had higher proficiency than high school students. However, university students might have experienced more flow for many other reasons than proficiency, such as age, more maturity or more interest in school.

Furthermore, even if the state of flow is considered to be within everyone's reach, students who are beginners in their L2 might encounter some frustrations at first if they attempt to undertake tasks like the picture-narration task used in this research. Jackson and Csikszentmihalyi (1999) mention that "it is only when the skills are so well practiced as to have become automatic that one can abandon oneself to spontaneous action and experience flow" (Jackson & Csikszentmihalyi, 1999, p.51). Therefore, the students need the skills and the experience to face the challenge of the task. This explains why the dimension of skill-challenge balance is essential here: it is about the perception of skills and challenges in the task that pushes someone in and out of flow. Indeed, Egbert (2003) mentions that in foreign language classrooms, some beginner students might find it more difficult to be interested in the class if they cannot reach a certain level in all the four dimensions of flow. In other words, beginners can still experience flow, but they need to have the right tasks put in from of them, and they also need to have immediate access to the appropriate resources to help them through the tasks. Since our research was conducted using an oral narration task, there is a minimum threshold level of proficiency needed to experience flow. In this study, no participant considered themselves to be beginners and thus, the minimal level of perceived proficiency for experiencing flow appears to have been reached by every participant.

In conclusion, perceived proficiency (as measured by perception of task difficulty) appears to play a role in learners' flow experiences during oral narration tasks, as supported by the observed trend between the attention dimension of flow and the perceived proficiency of the participants measured by the perceived difficulty of the task. We also found that the more people found the task easy, the more attention and control they experienced during the task. Therefore, even though there is not a direct link between perceived proficiency and all of the dimensions of flow, we observed that the easier the participants perceive the task, the more they experienced some dimensions of flow, namely control and attention.

5.1.2 Question two: Flow and L2 speech production quality

The second research question formulated in chapter four was the following: Does flow interact with speech production quality during an L2 narration task? Now that we better understand how perceived proficiency interacts with flow experiences, we turn to the speech production quality. Since some of the data were not normally distributed, a non-parametric one-tailed Spearman's correlation test was run using the results obtained during the data collection. All the variables related to speech production quality (complexity, accuracy, words/minute, pause/minute, reformulations and repetitions) were taken into account, as well as the various dimensions of flow. In light of the small variability in flow scores, another series of analyses were run comparing flow groups, that is a high-flow group (top 30%) and a low-flow group (bottom 30%). Results from the corresponding Mann-Whitney U-tests offered some interesting results.

The first thing to note is that flow is negatively correlated with complexity, which means that the more participants were in a state of flow, the less complex their speech

was. In other words, the more focused, interested and in control the participants were, the fewer subordinate clauses they produced in their narration. This finding goes against our hypotheses, because, theoretically, people experiencing flow exhibit exploratory behaviour, and one would expect this behaviour to translate into more complex utterances. (Csikszentmihalyi, 1989; Czimmermann & Piniel, 2016). Furthermore, according to Skehan and Foster's findings (1999), if the processing load decreases, which we would expect in the flow state, the complexity should increase. However, this was not the case here. It might be due to the nature of the picture-narration task. Having to describe a story picture by picture might lead participants to use clear and simple sentences to develop a clearer version of what is happening in the narrative. One might suggest that by adding more details to their sentences (more complexity), they would lose focus of the main goal of the activity—that of summarizing what they see in the story in front of them. Therefore, participants in a state of flow might have been more focused on telling the story in a straightforward manner than trying to add details that would have made their speech more complex. Another explanation can be found in the trade-off hypothesis (Skehan, 2009): increases in fluency and accuracy scores led to a decrease in complexity.

Moreover, another negative correlation between the dimension of interest and complexity was observed. This correlation means that the more people were interested in the picture-narration task, the less complex their speech production was. Here again, this correlation helps understand the connection between flow and complexity; interest is one of the three dimensions taken into account to calculate the general level of flow in this research. Thus, we might interpret that participants were probably more interested in the task itself and not the complexity of the language production

associated with it and that they probably wanted to be clear and concise more than adding details to each frame, which led to less complex speech.

We also found that the dimension of control is positively correlated with the number of reformulations. In other words, the more participants felt in control, the more reformulations they made during the picture-narration task. When people feel more in control, they may feel like they have the opportunity to reformulate what they say because they feel like they should make what they say as clear as possible; since they feel in control, they have the time and cognitive resources to do so. When reformulations were examined, we thought that it was a sign of disfluency and, therefore, in this case, that a dimension of flow (control) would be correlated with the other manifestations of disfluency. However, reformulations can sometimes be considered a sign of fluency, depending on the type of reformulation. Indeed, Witton-Davies (2010) explains that grammatical reformulations are considered as signs of disfluency because they are not present in the native speaker's speech, whereas lexical reformulations are considered as signs of fluency because they add something to the speech. Therefore, it would have been interesting to divide the reformulations into two different groups, but since this consideration only came to light when analyzing our results, we cannot use this variable as a fluency or disfluency measure.

After doing the correlation test, we executed high- and low-flow group comparisons. Using a one-tailed Mann-Whitney U-tests, we observed that the high-flow group produced speech that had more words per minute (fluency), more reformulations and was more accurate. The high-flow group produced fewer repetitions than the low-flow group. Even though these differences were not significant, they all trended in the direction of our hypotheses. A study with more participants might yield more

significant results. These results, taken together, suggest that flow interacted positively with fluency and accuracy. In other words, participants who were in a state of flow did produce more accurate and fluent speech.

However, the complexity aspect of speech production was not enhanced by the level of flow. On the contrary, complexity scores were lower when participants were more interested in the task. This might be explained by Skehan's trade-off hypothesis. According to Skehan's trade-off hypothesis (2009), complexity, accuracy and fluency are all interconnected in such a way that if attention is committed to one area, then the results of the two others might be hindered. Therefore, having all three CAF measures increase together during one given task would be unlikely. Even for native speakers, focusing on complexity, accuracy and fluency is very difficult. All things considered, flow helps participants produce speech that appears to be more fluent and accurate, but not more complex speech, which can also explain the first correlation we mentioned between flow and complexity.

If we look at the results of the only other study on flow in L2 performance (Amini & al., 2016), it showed that being in a state of flow helped learners with vocabulary retention. Even if we cannot make direct links between the two studies, we can observe that both of them concluded that the state of flow plays a positive role in L2 performance.

In sum, the results seem to support our hypotheses. Indeed, we thought the state of flow was going to help participants produce better speech quality in general, which means better complexity, accuracy and fluency. However, what we observed is that flow seems to help participants produce more accurate and more fluent speech, but not more

complex speech. Furthermore, it is essential to notice that these results are simple observations of trends and are not the results of significant correlations. Further research is necessary to explore these trends.

5.2 Research limitations

This research was carried out in a specific context, and this context cannot be ignored in light of the results we obtained.

First of all, this research was done in a laboratory context with adults. This was not a field experience, and the participants were not actively learning their L2. Thus, it would be interesting to conduct a similar experiment done in an L2 classroom context. The participants in this research were not accustomed to performing a task such as this narrative exercise in their L2, whereas, had the participants been students of English as an L2, they might have been more prepared for this type of activity.

Moreover, we only managed to get 35 participants, and that number seems low to draw a conclusion significant enough to be applied to a general public of adult L2 learners. As previously mentioned, we cannot come to a general conclusion, but this can add to the existing literature regarding flow in an ESL context.

Concerning the first question, one of the research limitations we can observe is that the perceived proficiency test was self-assessed. Since perceived proficiency was not the main variable of this research, we only used a quick self-assessed test that gave us an approximate level of perceived proficiency of the participants. Though the state of flow is a subjective experience, and even if the perceptions of the participants are necessary

for that context, it might yield interesting results to have them take a general proficiency test.

5.3 Future directions

As for future directions, it would be interesting to do a study in class, in which students in an ESL class assess their flow levels after different tasks to see how flow influences learning outcomes. It would also be interesting to do a replication study with a larger sample size to verify the results of this research. On the whole, if being in a state of flow is helpful for learners of L2, we should endeavour to gain a better understanding of its implications within this context via further research and attempt to implement tasks that will push learners in this zone more often. Furthermore, flow is still a new concept that needs to be explored and even though few have an in-depth understanding of this concept or what it involves—especially in an academic context. Finally, it would be interesting to see how flow influences the learning outcomes of learners of L2 in different modalities (writing, reading and listening).

CONCLUSION

This research began with two main questions. The first one being if perceived proficiency in an L2 plays a role in the experiencing of a flow state. The second one being the role, if any, of flow on the speech production quality. We have a good idea about what types of tasks help L2 students experiencing flow (Aubrey, 2017; Cho, 2018; Egbert, 2003; Zuniga & Rueb, 2018), but we know much less about how the state of flow interacts with L2 speaking performance. Thus, more research is required on the subject in order to draw more definitive conclusions.

Our literature review allowed us to understand the situation from different angles. The state of flow, which involves a balance between skills and challenges, control over the task, focused attention, and intrinsic interest towards the task, is an optimal state of mind that has the potential to help L2 students become involved and stay involved in the learning process. Csikszentmihalyi's theory of flow is the result of decades of research on a specific positive state of mind, and the analysis of the theoretical framework helped to develop a deeper understanding of this theory, specifically, its potential applications within the context of L2 acquisition. Since flow is a state of mind that spreads out on a continuum with its four dimensions, it was essential to consider not only the general level of flow of the participants but also each dimension and how learners experienced it during the task. After examining flow (including the general level of flow and its four dimensions) and the speech production quality measures (CAF measures), we anticipated that all three measures would be positively linked with the state of flow. Since being in a state of flow structures attentional resources, and

since speaking an L2 demands more attentional resources than speaking in an L1, we expected flow to help all three CAF measures.

We used a one-shot experimental study in which 39 students at the university level with English as an L2 participated. Their perceived proficiency level was self-assessed at the beginning, and then they completed a picture-narration task that was recorded for evaluation purposes. Afterwards, the participants completed a flow perception questionnaire, which allowed us to collect data on the participants' perception of task difficulty, the intensity of their flow experience (including all four dimensions).

The results revealed that the self-assessed level of proficiency is correlated with neither the general level of flow nor any of the flow dimensions. However, perceived task difficulty plays a role in the state of flow. Indeed, we noticed that the second proficiency variable (the perceived difficulty of the task) is correlated with both control and attention. Thus, those two dimensions are positively correlated with the level of perceived difficulty, which means that the more proficient participants were, the more control and attention they experienced.

As for the results of the second question, at first, we found a negative correlation between the general level of flow and the level of complexity. Then, we found an even stronger negative correlation between the dimension of interest and level of complexity, which may explain why the general level of flow is negatively correlated with complexity in the first place. After dividing the general level of flow between a high-flow group and low-flow group, we found that participants who were in the high-flow group did get higher (but not significantly higher) scores with accuracy and fluency levels. The low complexity scores when flow occurred can be explained by the

trade-off hypothesis that claims that when one of the CAF measures increases, there will be trade-off effects on at least another of the CAF measures.

The results suggest the following:

1. The more people perceive a picture-cue narration task as being easy, the more they will experience flow.
2. The higher the general level of flow is, the more accurate and fluent people's speech is when performing an L2 picture-narration task. However, the trade-off effect makes complexity decrease as the level of flow, accuracy, and fluency increases.

To conclude, the state of flow is a beneficial experience for L2 learners that need to be studied in more depth in the future. The advantage of having L2 learners be intrinsically interested, in control, fully focused on and challenged by the task, is crucial to the positive development of L2 learning outcomes. It would be interesting to verify if, in the long run, being in a state of flow as often as possible helps students improve their L2, not only on the speaking level, but also on all the other modalities (writing, reading, and listening).

APPENDIX A – SOCIO-DEMOGRAPHIC QUESTIONNAIRE

Quelques questions à propos de vous

Participant : _____ Date _____

Veuillez remplir le questionnaire

1. Langue maternelle: _____
2. Autres langues apprises en ordre d'acquisition:

   1. _____ 2. _____ 3. _____
3. Langue parlée à la maison: _____
4. Langue parlée avec amis: _____
5. Âge: _____
6. Genre : _____
7. Comment percevez-vous votre **niveau d'anglais**? Indiquez la description[1] qui vous décrit le mieux.
   - _____ **Débutant** : je peux utiliser des expressions et des phrases simples pour décrire mon lieu d'habitation et les gens que je connais.
   - _____ **Post-débutant** : je peux utiliser une série de phrases ou d'expressions pour décrire en termes simples ma famille et d'autres gens, mes conditions de vie, ma formation et mon activité professionnelle actuelle ou récente.
   - _____ **Intermédiaire** : je peux m'exprimer de manière simple afin de raconter des expériences et des événements, mes rêves, mes espoirs ou mes buts. Je peux brièvement donner les raisons et explications de mes opinions ou projets. Je peux raconter une histoire ou l'intrigue d'un livre ou d'un film et exprimer mes réactions.
   - _____ **Post-intérmédiaire** : je peux m'exprimer de façon claire et détaillée sur une grande gamme de sujets relatifs à mes centres d'intérêt. Je peux développer un point de vue sur un sujet d'actualité et expliquer les avantages et les inconvénients de différentes possibilités.
   - _____ **Avancé** : je peux présenter des descriptions claires et détaillées de sujets complexes, en intégrant des thèmes qui leur sont liés, en développant certains points et en terminant mon intervention de façon appropriée.
   - _____ **Post-avancé** : je peux présenter une description ou une argumentation claire et fluide dans un style adapté au contexte, construire une présentation de façon logique et aider mon auditeur à remarquer et à se rappeler les points importants.
8. Quel est votre niveau de certitude en pourcentage par rapport à votre autoévaluation? Indiquez une valeur numérique entre zéro et 100: _____ %.

[1] Les descriptions des compétences dans cet item sont tirées du *Cadre européen commun de référence*.

APPENDIX B – COMIC STRIP

APPENDIX C – FLOW QUESTIONNAIRE

Votre état d'esprit pendant la tâche de narration

☑ **Nom:** _____ Date: _____

Veuillez nous décrire votre expérience pendant l'activité à laquelle vous venez de prendre part.

1. Cette tâche a suscité ma curiosité.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

2. Cette tâche était intéressante en soi.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

3. J'ai senti n'avoir **aucun contrôle** sur ce qui se passait durant cette tâche.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

4. Cette tâche était difficile pour moi.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

5. En faisant cette tâche, j'ai eu conscience que j'avais été distrait.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

6. Cette tâche m'a rendu curieux.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

7. Cette tâche était amusante.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

8. Je referais cette tâche.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

au verso

9. J'avais l'impression d'être en contrôle de ce que je faisais.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

10. En faisant cette tâche, j'étais totalement absorbé par ce que je faisais.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

11. Cette tâche était ennuyeuse.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

12. Durant la tâche, j'ai pu prendre des décisions sur son déroulement.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

13. En faisant cette tâche, je pensais à d'autres choses.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

14. Cette tâche a suscité mon imagination.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

15. Je ferais cette tâche même si elle n'était pas obligatoire.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

16. Cette tâche était trop facile pour moi.

	1	2	3	4	5	6	
*fortement en **désaccord***	O	O	O	O	O	O	*fortement **d'accord***

au verso

APPENDIX D – CONSENT FORM

UQÀM
Université du Québec à Montréal

Montréal, mars 2019

Bonjour,

D'abord, nous vous remercions d'avoir accepté notre invitation à participer à notre étude. Avant de vous demander de signer le formulaire de consentement, nous vous présentons dans ce qui suit des renseignements concernant l'étude en question et ce que votre participation implique. Ces informations vous sont présentées afin d'éclairer votre consentement à participer à notre étude.

Dans le cadre de notre travail, nous nous intéressons aux facteurs influençant la production orale. À cet égard, votre participation implique la réalisation de cinq (5) tâches qui sera supervisée par l'un ou l'autre de nos délégués-assistants de recherche, à savoir madame Charlène Nault ou encore monsieur Guilhem Bénard.

Ces tâches correspondent à une tâche d'attention, une courte tâche de narration à partir d'images que vous effectuerez en anglais et trois questionnaires, dont un questionnaire sur votre profil linguistique, un questionnaire portant sur votre était d'esprit et un questionnaire sur votre humeur lors de la réalisation des tâches, tous en français. Le temps requis pour accomplir l'ensemble de ces tâches est d'environ 30 minutes. Le tout se déroulera lors d'un moment convenu avec vous et tout le matériel nécessaire vous sera fourni gratuitement. Au terme de votre participation, vous recevrez une somme de dix dollars.

Cela dit, nous tenons à vous assurer que les réponses fournies aux différentes tâches seront utilisées à des fins uniquement scientifiques, et que la confidentialité de vos réponses sera assurée. De la même manière, votre identité ne sera jamais divulguée. Aussi, votre participation à ce projet est volontaire. Cela signifie que vous acceptez de participer au projet sans aucune contrainte ou pression extérieure et que, par ailleurs, vous être libre de mettre fin à votre participation en tout temps au cours de cette recherche, auquel cas les renseignements vous concernant seraient détruits. Enfin, sachez que notre projet a été approuvé sur le plan de l'éthique de la recherche avec des êtres humains par le Comité d'éthique de la recherche (CERPÉ) de l'UQAM. Si jamais vous aviez des questions concernant l'étude, vous pouvez nous joindre à l'adresse de courriel suivante simard.daphnee@uqam.ca ou encore zuniga.michael_j@uqam.ca. Nous nous ferons un plaisir de vous répondre. Si vous préférez, vous pouvez joindre directement le comité d'éthique au numéro (514) 987-3000 poste 7753 ou par courriel à l'adresse : ciereh@uqam.ca.

Nous vous remercions à l'avance pour votre précieuse collaboration sans laquelle le développement des connaissances relativement à l'acquisition des langues secondes est impossible ! Afin de nous confirmer votre souhait de participer à l'étude, nous vous prions de signer la déclaration de consentement éclairé se trouvant sur la page suivante.

Avec nos salutations les meilleures,

Daphnée Simard, PhD
Professeure, département de linguistique

Michael Zuniga, PhD
Professeur, département de didactique des langues

DÉCLARATION DE CONSENTEMENT ÉCLAIRÉ

Je déclare avoir lu et compris toutes les informations contenues dans la lettre ainsi que les garanties fournies par les chercheurs et leurs délégués. Je comprends que je peux me retirer du projet en tout temps, sans pénalité d'aucune forme, ni justification à donner. Je comprends également que l'anonymité de mes informations personnelles sera protégé. Enfin, je sais qu'au terme de ma participation je recevrai une somme de dix dollars en rétribution.

Au moyen de ma signature que confirme que je consens volontairement à participer à ce projet de recherche.

Signature : _____

Nom (lettres moulées) et adresse courriel :

_____

Déclaration des chercheurs ou de leurs délégués :

Je, soussigné déclare avoir expliqué les informations reliées à l'étude et au consentement éclairé et avoir répondu aux questions posées.

Signature : _____

Nom (lettres moulées) et coordonnées :

_____

Fait à Montréal, le _____ 2019.

*Page produite en double, dont l'une a été remise au participant et l'autre est conservée au dossier

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