In Flow with Task Repetition During Collaborative Oral and Writing Tasks

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Abstract

The present study draws on Flow Theory to examine the relationship between task repetition and the quality of learners' subjective experience during task execution. Flow is defined as a positive experiential state characterized by intense focus and involvement in meaningful and challenging, but doable tasks, which has been associated with enhanced self-confidence and task performance (Csikszentmihalyi, 2008). While research shows that certain task characteristics interact differentially with the quality of flow experiences, no research has specifically examined such interaction with task repetition. Participants (n=24) were randomly assigned to a Task Repetition or a Procedural Repetition group. All participants first completed a two-way decision-making gap task in both the oral and written modalities and either repeated the identical task or a comparable task one week later. Data were collected with a flow perception questionnaire, completed immediately following each task. Results show that repetition positively influenced learners' flow experience, but that modality was an important mediating factor.

Résumé

Cette étude s'appuie sur la théorie de l'expérience optimale (EO), souvent désignée par le nom *flow*, pour examiner les relations entre la répétition des tâches et la qualité de l'expérience subjective des apprenants en accomplissant desdites tâches. L'EO est un état subjectif de bien-être caractérisé par une combinaison de motivation intrinsèque et de confiance en soi qui se produit lors de l'immersion complète dans une tâche (Csikszentmihalyi, 2008). Bien que les recherches montrent que certaines caractéristiques des tâches interagissent avec l'EO, aucune recherche n'a spécifiquement examiné la répétition des tâches. Les participants (n=24) ont été assignés au hasard à l'une de deux conditions de répétition. Tous les participants ont d'abord effectué une tâche collaborative avec une composante orale et écrite. Une semaine plus tard, ils ont répété soit la même tâche soit une tâche semblable. Les données ont été recueillies à l'aide d'un questionnaire sur l'EO. Les résultats montrent que la répétition a interagit positivement avec l'EO, mais que la modalité a été un facteur de médiation important.

In Flow with Task Repetition During Collaborative Oral and Writing Tasks

Flow is an intrinsic motivational state characterized by positive affect and full cognitive engagement that occurs when learners are immersed in meaningful and challenging, but doable activities, with clear goals, a sense of agency and internal feedback (Csikszentmihalyi, 2008). While in flow, individuals experience a merging of action and awareness, resulting in feelings of well-being, a loss of self-consciousness and an altered sense of time (flying). Such flow experiences are not only enjoyable while they occur but are also followed by positive affective states as individuals revel in their accomplishment. Positive emotions contribute to improved performance by inciting individuals to spend more attention-focused time on various activities and to seek opportunities to repeat said flow-inducing activities (Csikszentmihalyi, 2008, 2014). In the field of second language (L2) education, there is a long tradition of research that has examined learner motivation which shows that motivated learners tend to experience greater L2 learning success (Dörnyei, 1998, 2018). Theories of motivation, like Flow Theory, have begun to garner L2 researchers' attention and results from empirical studies show that language learning activities interact differentially with flow experiences (e.g., Aubrey, 2016, 2017; Cho, 2018; Czimmermann & Piniel, 2016; Egbert, 2003; Oxford, 2017; Kirchhoff, 2011; Zuniga & Rueb, 2018). Within the field of task-based language teaching (TBLT), research has examined learners' perception toward several task variables, namely, task modality (Cho, 2018), task complexity (Kim, Jung & Tracy-Ventura, 2017), task types (Bao & Kirkebæk, 2013; Payant, 2019), and task difficulty (Un-udom & Patanasorn, 2020). Task repetition, introduced by Bygate (1996, 2001), has received some attention as of late (see e.g., Bygate, 2018) and has generally shown that repeating a task (or an aspect of a task) benefits learners' language output. While learners appear to appreciate having the opportunity to repeat a task, research has not examined such engagement from the perspective of Flow Theory (Csikszentmihalyi, 1975, 2008, 2014). The present study fills this gap by closely examining how learners of English as an additional language (EAL) experience flow as they complete and repeat two collaborative decision-making tasks in both the oral and written modalities.

Flow Theory

The construct of flow has been investigated in a wide range of everyday activities such as writing (e.g., Abbott, 2000; Larson, 1988), reading (e.g., McQuillan & Conde, 1996), using communication technology (e.g., Ghani & Deshpande, 1994; Trevino & Webster, 1992; Webster, et al., 1993), doing math (e.g., Shiefele & Csikszentmihalyi, 1995), playing chess, rock climbing and surgery (e.g., Csikszentmihalyi, 1975). Flow-inducing activities are foremost driven by intrinsic motivation which "refers to doing something because it is inherently interesting or enjoyable" (Ryan & Deci, 2000, p. 55) and is driven by universal psychological needs for competence, relatedness, and autonomy (Ryan & Deci, 2018). Flow-inducing activities must be meaningful, offering opportunities to expand skills and develop social relations (through collaboration) and the freedom to explore, make choices and push limits (Csikszentmihalyi, 1975, 2008). Finally, flow-inducing activities present an optimal balance between skills and challenges: activities perceived as too difficult can result in anxiety or frustration, and those perceived as too easy, in boredom or disengagement (Csikszentmihalyi, 2008; Ghani & Deshpande, 1994;

Trevino & Webster, 1992). Both boredom and anxiety are anti-flow mental states that have a destructuring effect on attention (Csikszentmihalyi, 1975). Indeed, boredom invites daydreaming and mind wandering, while anxiety deviates attentional resources from the task at hand to the source of the anxiety which is often associated with a perceived lack of competence. In this sense, flow-inducing activities must afford individuals autonomy and control, allowing them not only to perceive themselves as the author of their own actions but also to modify or adjust task difficulty according to their perceived skill levels so as to bring the task into what Csíkszentmihályi (2008) refers to as the "*flow channel*," that is, the zone between anxiety (task perceived as too challenging) and boredom (task perceived unchallenging).

Researchers aiming to operationalize flow (e.g., Egbert, 2003; Webster et al., 1993) have proposed four fundamental dimensions to define flow-enhancing activities. First, such activities must be meaningful and stimulate learners' interest; second, they must represent a perceived balance between learner skills and task challenges; third, they must offer learners a sense of agency and control over their actions; and fourth, they must structure and focus attention such that one loses a sense of time and self. Measurement instruments designed to measure flow in the field of L2 learning and teaching (e.g., Cho, 2018; Egbert, 2003; Zuniga & Rueb, 2018) typically operationalize these four dimensions.

With specific regard to L2 learning activities, flow has been described as a sign of "ultimate task engagement" (Philp & Duchesne, 2016, p. 59). It has indeed garnered the interest of L2 researchers aiming to examine how the completion of language learning activities interacts with motivation and engagement in the classroom (e.g., Aubrey, 2016, 2017; Czimmermann & Piniel, 2016; Egbert, 2003; Kirchhoff, 2011; Oxford, 2017; Zuniga & Rueb, 2018). Some have proposed techniques for inciting flow in anxious students (e.g., Oxford, 2017), while others have attempted to observe flow dynamics in the classroom as learners engage in various types of L2 tasks. Egbert (2003), for example, examined seven different language learning activities, finding the greatest flow intensity in an internet chat activity with native Spanish speakers. She argues that the novelty and authenticity of this type of activity may have stimulated learners' interest, and its open-ended nature may have offered them a sense of control over their actions and the possibility to explore. Kirchhoff (2011) observed flow during extensive reading, an activity that meets many flow requirements: access to level-appropriate reading materials (skill-challenge balance), student selection of reading material (control and interest), immersion into stories (focused attention). Aubrey (2017) detected more flow among learners completing a series of information gap activities in an intercultural condition (with members of another culture) than in an intra-cultural one (with members of the same culture). Diary data suggest that flow was enhanced by a greater sense of control and accomplishment in the intercultural context. More recently, Zuniga and Rueb (2018), examining the flow intensity of 424 learners completing 24 different L2 language activities and tasks, found that games and other interactive activities conducted in a group setting, involving movement, an element of competition and ongoing feedback generated significantly more flow than language-focused activities completed individually. What this body of research suggests is that flow-inducing activities are meaningful and interesting for learners, tend to offer a perception of control and autonomy, and present a balanced challenge, allowing learners to explore and stretch their competency. These studies have examined the construct of flow using a wide variety of language learning activities without clearly operationalizing the construct of language activities or tasks. In turn, within the camp of TBLT research, the construct of

flow has not been adopted to examine learners' experiences during task completion. More specifically, the interaction between repeating an identical task or the procedure of a task on the learners' flow experience has not been investigated. In this paper, our aim is to closely investigate the relationship between flow and pedagogical task repetition with learners of EAL.

Task-Based Language Teaching: Task Repetition Research

Task-based language teaching research strives to better understand how tasks can develop communicative ability and linguistic accuracy in a new language (Ellis, 2018). To distinguish tasks from other instructional activities, Ellis and Shintani (2014) outlined four criteria, namely, that language use should focus primarily on meaning resembling that of the real world, that there be some form of gap, that learners must make use of linguistic and non-linguistic resources to resolve communication breakdowns or meet their intended communicative outcomes, and finally, and importantly, that there be an authentic (non-linguistic) outcome, not only language use. TBLT research has closely examined how interactional authenticity through task implementation promotes L2 development (Ellis, 2018) and the associated benefits abound. In her publication, Kim (2015) schematized numerous key task design and task implementation variables. One key task implementation condition which has attracted significant attention is task repetition, which was first introduced by Bygate (1996; 2001) who defined task repetition as the "repetition of the same or similar task" (Bygate, 2016, p. 393). Ellis (2005) saw task repetition as a rehearsal; an opportunity for learners to prepare for a second performance, which he termed pre-task planning. Bui (2014), however, makes a distinction between repetition and rehearsal. In the former, learners are not made aware that they will be repeating the same task, and in the latter, there is "repetition with awareness of future performance" (p. 66). The present study is situated in the context where learners are not informed in advance of repetition procedures, which is in alignment with the construct of task repetition (Bui, 2014). Research has linked task repetition to gains in fluency and accuracy because it provides learners with additional opportunities to mediate complex tasks (Bygate, 2016, 2018). Before turning to empirical evidence, we explore Levelt's (1999) speech production model, which will provide some cues for understanding the efficacy of task repetition on L2 learners' language development.

Speaking in an L2 is a complex task whereby learners must allocate limited cognitive resources to multiple parallel and competing linguistic processes related to the conceptualization and morphophonological encoding of utterances (Levelt, 1999). While these processes are stable, automatized, and occur with few cognitive resources for first language (L1) and higher proficiency L2 users, for many L2 learners, especially incipient ones, those same processes are governed by error-prone, unstable and developing linguistic knowledge whose mobilization can result in cognitive overload (de Bot, 1992) and increases in disfluencies (Zuniga & Simard, 2019). In addition to such linguistic challenges, many learners can also have difficulty understanding the interactional demands and procedures related to the assigned tasks (Bygate, 2018; Payant & Reagan, 2018). Task repetition can alleviate such cognitive overload and allow learners to rehearse key linguistic features in the form of declarative knowledge (Bygate, 2001). Repeated practice "helps the learner to engage (*repeatedly*) in the mental behaviours that allow the building of proceduralized knowledge" (Dekeyser, 2018, p. 30). This automaticity facilitates the

allocation of limited cognitive resources to the language itself, thus benefiting task performance and subsequent language development (Dekeyser, 2018; Ellis, 2003; Kim, 2015; Samuda & Bygate, 2008). Further, through repetition, learners become more familiar with task procedures and task expectations (D'Ely et al., 2019; Payant & Reagan, 2018).

Many studies have examined the impact of *task repetition* (TR) (same task, same content), *procedural repetition* (PR) (same task, new content), and/or *content repetition* (CR) (same content, different task) for speaking tasks occurring across the span of days or weeks on L2 development, operationalized as complexity, accuracy and fluency (CAF). Some studies have observed improvement in all three CAF measures (e.g., Ahmadian & Tavakoli, 2011; Kim and Tracey-Ventura, 2013), while others report significant increases in complexity and tepid increases in accuracy (e.g., Gass et al., 1999), or increases in fluency and accuracy, but not complexity (e.g., Bygate, 1996; Lynch & McLean, 2000) and increases in fluency and complexity, but not accuracy (e.g., Bygate, 2001). Other studies drawing on CAF measures examining multiple repetitions in a single class period have found immediate positive impacts on fluency (e.g., Thai & Boers, 2016; Lynch & McLean, 2000) and tepid gains in accuracy (e.g., Lynch & McLean, 2000). Patanasorn (2010) compared the CAF measures in both the TR and PR conditions, finding greater morphological accuracy with PR and more fluency with TR. Taken together, the results suggest that task repetition is particularly useful for increasing complexity and fluency (Bygate, 2001, Ellis, 2003). Despite these findings, it is important to recall that task repetition is not always operationalized or measured in the same way and strong generalizations should not be made. Aside from the CAF research, other studies have reported improved lexical development (e.g., Kim et al., 2018), decreased reliance on L1 (e.g., Azkarai & García Mayo, 2017), and enhanced collaborative dialogue (e.g., Kim, 2013; Kim & Payant, 2014; Payant & Reagan, 2018) as a result of task repetition.

Similar to L2 speaking, L2 writing poses its own set of challenges as an interactive and recursive process involving three parallel subsystems, namely, formulation, execution, and monitoring (Kellogg, 1996), each of which places varying demands on cognitive resources (Kormos, 2011, 2014). Task repetition may also be a way to alleviate the cognitive load experienced during writing tasks. Responding to a recent call to extend task repetition research to other contexts, Carver and Kim (2020) compared the impact of content and procedural repetition with one specific linguistic target (passé composé) during a collaborative writing task with French learners. They found that during task performance the TR group provided the target feature more frequently and with greater accuracy than the PR group. However, no significant changes in the learning of this target form were identified. The impact of task repetition for L2 writing development is quite new and thus difficult to determine how it impacts language performance and development. Despite this, overall, this body of research suggests that task repetition may indeed serve to alleviate pressure on cognitive processes associated with both writing and speaking, but the impact appears to be more important with this latter skill.

Various studies have also examined learners' beliefs and feelings about task repetition in a variety of instructional contexts. Using TR with a spot-the-difference task, Pinter (2005, 2007) found that younger learners enjoyed the repetition and expressed greater confidence and cooperation. With regard to motivation, Shintani (2012) observed elevated levels even across nine repetitions of the same task, while Kim (2013) observed increased confidence, but a decrease in motivation after the third repetition. However, the PR condition appears to create less repetition-related demotivation than the TR condition

(Kim, 2013). In Payant and Reagan (2018), learners expressed appreciation for TR, even if some were either surprised or annoyed to repeat the same task. They recognized that the practice was beneficial to competency development and noticed that the tasks were easier the second time. As for learners in their PR condition, comments were positive, but more directed toward the collaborative experience than toward the task repetition itself. This might suggest that the PR group was less aware of the repetition than the task repetition group.

A task-centered psychometric measure of task enjoyment and engagement, such as flow, might help make the TR and PR conditions more comparable. We believe that task repetition might be a task condition that has the potential to help learners moderate task difficulty. We further hypothesize that this can also bring learners into a "flow channel," that is the perceived balance between learners' skills and the challenges posed by the task, thereby increasing control and attentional focus, two essential components of the flow construct. However, as flow is a form of intrinsic motivation, one might expect the redundant nature of task repetition to cause potential problems related to boredom and demotivation.

The Present Study

The objective of this research is to contribute to our understanding of how task repetition interacts with learner engagement as observed through Flow Theory. Task repetition and procedural repetition could interact with the flow experience in many ways. On the one hand, numerous studies suggest that task repetition can help learners practice and build up the skills and resources necessary to autonomously carry out meaningful language tasks, essentially helping them bring those tasks into the "flow channel" of balance between learners' skills and task challenges. On the other hand, Kim (2013) suggests that task repetition reduces novelty and can reduce motivation, an anti-flow state. This boredom effect, however, may be countered by procedural repetition (Kim, 2013; Payant & Reagan, 2018), which might be a way to help learners experience more flow by benefiting from flow-inducing skill development without the boredom effect linked to repetition of the same material.

It must also be noted that the quasi totality of task repetition research was conducted with speaking tasks. The inconspicuous absence of the effects of task repetition and writing tasks makes sense in that speaking implies simultaneous, on-line planning and linguistic processing, making it particularly susceptible to repetition effects. As for writing, its time-flexible and recursive nature–which allows learners to plan, produce, pause, consult resources and revise at will–might make it less susceptible to task repetition. In essence, writing tasks might, by their nature, offer more opportunities to learners to control task difficulty without repetition. With this knowledge in hand, we ask the following research questions:

1. How do task repetition and procedural repetition interact with the flow experience and task difficulty perception during collaborative tasks?
2. Are there differences between these interactions across task modalities?

Method

To answer our research questions, we designed a quasi-experimental study to observe the interaction between flow, operationalized as flow intensity and task difficulty, and two task repetition conditions containing collaborative oral and written components.

Participants

Participants included 24 university-level learners of EAL, 14 women and 10 men. The participants came from a wide range of L1 backgrounds: 10 Spanish, six French, two Japanese, two Russian, two Romanian, and one speaker of Creole and Portuguese. About half the participants had English as a second language (52%), and half, English as a third language (48%). The learners' mean proficiency score was 2.79 ($n = 24$, $SD = 0.58$) on a scale of 1 to 5. About one-third of the participants assessed themselves as low-intermediate ($n = 7$; 29%), two-thirds ($n = 15$; 63%) as intermediate, and two (8%) as advanced. No participant considered him or herself as a beginner.

Data Collection Instruments

Sociodemographic Questionnaire

A 14-item questionnaire was used to gather data about participants' age, gender, education, linguistic profile and, more specifically, experience with EAL.

Flow Perceptions Questionnaire

To gather data about learners' flow experience during each of the study's tasks, we used the perceptions questionnaire published in Egbert (2003), which contains 14 Likert-scale items designed to measure three base components of the flow construct: interest (*This task excited my curiosity*.), attention focus (*When doing this task, I was aware of distractions*.) and control (*I felt that I had not control over what was happening during this task*). To this, we added two items from Csikszentmihalyi et al. (1993) to assess skill-challenge balance (*This task was too hard. This task was too easy*.). Participants indicated their agreement with each statement on a 6-level Likert scale ranging from *strongly disagree* to *strongly agree*.

Task Appreciation Questionnaire

This questionnaire, designed to gather qualitative data about participants' appreciation of the different tasks and the task repetition procedures, contained five open-ended questions, for example: What did you like about the activities? What did you think about doing a similar task twice?

Collaborative Tasks

Two collaborative decision-making tasks, each with an oral and a written component, were used, one on the theme of traveling abroad and the other on renting an apartment. For the *Traveling Abroad* task, participants were first informed that they were part of a student committee whose role was to select a destination for an upcoming exchange program. Participants started with a 20-minute decision-making task, during which they had to exchange information about the food, culture, and activities of four potential destinations. Then they had 30 minutes to settle on a destination and collaboratively write an argumentative letter to the school director to justify their choice. For the *Renting an Apartment* task, participants were informed that they had to select an apartment for a group of exchange students to be hosted by the university. Like the procedures of the traveling abroad task, participants started with the decision-making task, in which they had to share information about four local apartments. Then they had 30 minutes to settle on an apartment and collaboratively write an argumentative letter to convince the exchange students of their choice. No instructions were given as to how to divide the sub-tasks implicated in collaborative writing (e.g., writing, planning, revising). Learners were invited to share the writing task, but specific roles (e.g., scribe, secretary) were not prescribed.

Procedure

The research team met with the dyads in a laboratory setting. To ensure coherent procedures, the participants viewed a short video describing the materials and the procedures of the decision-making task. On the first of two meetings, after viewing this video, participants were invited to sign the consent form and to complete the sociodemographic questionnaire. Participants were then randomly assigned to a dyad in one of two repetition conditions: task repetition (TR), during which learners repeated the same task with identical content; or procedural repetition (PR), which entailed an identical task type, but with new content. On Day 1, each dyad completed the decision-making task: *Traveling Abroad*. One week later, the TR group repeated the identical task while the PR group completed a similar decision-making task with a new topic: *Renting an Apartment*. The decision for a one-week interval between repetitions was informed by course schedules. While previous research suggests that task repetition positively affects task performance regardless of the length of intervals, one-week intervals appear to be particularly effective at enhancing language performance (i.e., structural complexity and repair fluency) (Bui et al., 2019). One might reasonably argue that such enhanced performance could mediate the flow experience through a perceived greater balance between learners' language skills and the challenges posed by the task. During each meeting, participants had 20 minutes to exchange information orally and 30 minutes to collaboratively come to a decision and compose their written response. Immediately after each task (oral and written), participants completed the flow perception questionnaire. Finally, at the end of the Day 2 session, participants were invited to answer the five open-ended questions on the task appreciation questionnaire.

Data Preparation and Coding

Sociodemographic Questionnaire

The data from the sociodemographic questionnaire were entered into an Excel spreadsheet by attributing a numeric code for nominal responses and the Likert score for ordinal responses.

Flow Perception Questionnaire

Data for the flow perception questionnaire were entered into an Excel spreadsheet. Negative items were reverse-coded and flow averages were calculated by dividing the sum of the Likert responses by the maximum possible score of 84, divided by 100 to obtain a composite flow ratio. The flow component ratios (i.e., interest, control, focused attention) were also calculated in the same manner. The skill-challenge balance was calculated as a separate measure by subtracting the result of the "too hard" item from the "too easy" item, yielding a 10-point scale with zero representing perfect skill-challenge balance, a minimum score of negative five (-5) for tasks perceived as too easy, and a maximum score of plus five (+5), for those perceived as too hard.

Task Appreciation Questionnaire

Qualitative data from the task appreciation questionnaire were transcribed verbatim and, typical of qualitative data analysis, the responses were read several times which led to the creation of several codes, including Time constraints, Decision-making, Collaborative writing, Familiarity with tasks, Boredom, Language learning, and Control. In line with the research objectives, only findings pertinent to task repetition are presented.

Analyses

We first verified the normality of the distribution for the data from the flow perception questionnaire by inspecting skewness and kurtosis ratios, examining histograms and using the Shapiro-Wilk test (Larson-Hall, 2010). Paired and independent sample t-tests were used to determine the statistical significance of group differences for normally distributed data, and Mann–Whitney U test and Wilcoxon rank-sum tests were used for variables not meeting those assumptions.

Results

In the first section, we present the descriptive statistics for general flow ratios, the flow component ratios and perceived task difficulty scores, before presenting the results and the statistical analyses we used to gain insight into our research questions. In the second section, we nuance our quantitative findings with the presentation of qualitative data related to learner perceptions about the tasks and their repetition procedures.

Descriptive Statistics

Table 1 presents the distribution data for the composite flow ratios, the flow component ratios (i.e., Interest, Control, Focus) and the perceived task difficulty scores experienced across the speaking and writing components of the tasks at T1 and T2.

Table 1
Descriptive Statistics: Composite Flow, Flow Components and Task Difficulty

	Mean ($N = 96$)	Min	Max	Skewness	Kurtosis
Comp. Flow	76 ($SD = 13.1$)	43	100	-.249 ($SE = .246$)	-.563 ($SE = .488$)
• Interest	78 ($SD = 16.6$)	39	100	-.403 ($SE = .246$)	-.748 ($SE = .488$)
• Control	70 ($SD = 16.7$)	22	100	-.377 ($SE = .246$)	-.109 ($SE = .488$)
• Focus	76 ($SD = 16.0$)	33	100	-.444 ($SE = .246$)	-.197 ($SE = .488$)
Difficulty	-1.35 ($SD = 2.1$)	-5	4	.175 ($SE = .246$)	-.391 ($SE = .488$)

Note. N = Total Sample Size; *SD* = Standard Deviation; *SE* = Standard Error

Inspection of Table 1 reveals that learners experienced an average flow intensity of 76/100 ($N = 96$, $SD = 13.1$) across tasks, with ratios ranging from a minimum of 43 to a maximum of 100. A Cronbach's alpha confirmed that the internal consistency of the flow perception questionnaire was acceptable (.765). Regarding the sub-components, the strong flow experience appears to have been driven by high Interest ($M = 78$, $SD = 16.6$) and Focus ($M = 76$, $SD = 16.0$). The learners experienced less Control ($M = 70$; $SD = 16.7$) as they completed the tasks. Finally, the average Difficulty score of -1.48 ($SD = 2.1$), which can range on a ten-point scale from too easy (-5) to too hard (+5), suggests that the four tasks across both conditions were experienced as slightly too easy. A Shapiro-Wilk test, histograms and skewness and kurtosis ratios confirm that the composite flow ratios and the control ratios are normally distributed. This was not the case for the other variables: Interest and Focus were characterized by moderate negative skews (i.e., high interest and focus), and perceived task difficulty, by a moderate positive skew (i.e., the tasks were perceived as generally too easy).

Flow and Task Repetition

In this section, we present results from statistical analyses offering insight into our research questions: How do task repetition and procedural repetition interact with the flow experience and task difficulty perception during collaborative tasks? Are there differences between these interactions across task modalities?

Table 2 presents the composite flow ratios, the flow component ratios, and the task-difficulty scores at T1 and T2 for the speaking and writing components in the identical Task Repetition condition (TR).

Table 2
T1-T2 Comparison of Flow and Task Difficulty for the Task Repetition Condition

Task	Flow	Time 1 (N = 14)	Time 2 (N = 14)	Difference
Speaking	Comp. Flow	75 (SD = 11.5)	72 (SD = 10.2)	-3
	• Interest	78 (SD = 14.1)	73 (SD = 16.8)	-5
	• Control	67 (SD = 13.9)	67 (SD = 14.5)	0
	• Focus	75 (SD = 18.5)	73 (SD = 13.5)	-2
	Difficulty	-1.29 (SD = 1.59)	-.43 (SD = 2.13)	+.86
Writing	Comp. Flow	68 (SD = 13.7)	68 (SD = 12.2)	0
	• Interest	67 (SD = 17.1)	69 (SD = 16.7)	+2
	• Control	65 (SD = 15.4)	60 (SD = 16.1)	-5
	• Focus	74 (SD = 17.3)	71 (SD = 15.5)	-3
	Difficulty	-.50 (SD = 2.47)	-.36 (SD = 2.27)	+.14

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

The results from the speaking component reveal that there was an insignificant 3-point drop in composite flow among the participants at T2 (M = 75, SD = 11.5) compared to T1 (M = 72, SD = 10.2). Inspection of the flow component ratios suggests that most of this slight drop appears to be accounted for by a 5-point decrease in interest from T1 (M = 78, SD = 14.1) to T2 (M = 73, SD = 16.8). Control and focus remained essentially unchanged from T1 to T2. Regarding flow experienced during the writing component, the T1 and T2 scores were nearly identical, with learners experiencing slightly less control at T2 (M = 60, SD = 16.1) than in T1 (M = 65, SD = 15.4). It appears that the repetition of the same exact task with a one-week interval neither increased nor diminished the flow experience. Furthermore, Table 2 shows that the perception of task difficulty was also essentially unchanged at T2 after having repeated the same exact task. Completing the tasks under the TR condition did not appear to interact with learners' perception of task difficulty. Paired-sample t-tests and Wilcoxon Signed-ranks tests confirmed that none of these differences were statistically significant.

Table 3 presents the composite flow ratios, the flow component ratios, and the task difficulty scores at T1 and T2 for the Procedural Repetition condition (PR) of the oral and written components, that is, the repetition of the same task with new content.

Table 3
T1-T2 Comparison of Flow and Task Difficulty for the Procedural Repetition Condition

Task	Flow	Time (N = 10[1])	Time 2 (N = 10)	Difference
Speaking	Comp. Flow	78 (SD = 9.9)	87 (SD = 10.2)	+9*
	• Interest	84 (SD = 9.7)	92 (SD = 12.1)	+8*
	• Control	74 (SD = 20.0)	74 (SD = 18.5)	0
	• Focus	70 (SD = 14.4)	86 (SD = 12.6)	+16*
	Difficulty	-2.20 (SD = 1.8)	-3.20 (SD = 1.3)	-1
Writing	Comp Flow	84 (SD = 9.7)	85 (SD = 13.7)	+1
	• Interest	84 (SD = 13.1)	89 (SD = 14.6)	+5
	• Control	82 (SD = 10.4)	77 (SD = 17.7)	-5
	• Focus	85 (SD = 9.46)	82 (SD = 18.8)	-3
	Difficulty	-2.60 (SD = 1.73)	-1.40 (SD = 1.58)	+1.20*

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

The results in Table 3 paint quite a different picture for the PR condition of the speaking task compared to its TR counterpart. We observe a significant 12% increase in flow experienced while learners repeated the same speaking task, but with new content, at T2 ($M = 87$, $SD = 10.2$) compared to T1 ($M = 78$, $SD = 9.9$), $t(9) = -2.581$, $p = .03$. A closer look at the flow component ratios shows that this increase in flow was driven by a strong and significant 23% increase in focus from T1 ($M = 70$, $SD = 20.0$) to T2 ($M = 86$, $SD = 18.5$), and a moderate 10% increase in interest from T1 ($M = 84$, $SD = 9.7$) to T2 ($M = 92$, $SD = 12.1$). A Wilcoxon signed-rank test reveals that this T1-T2 difference in interest is approaching significance, $Z = -1.83$, $p = .06$, and a paired t-test confirmed the significance of the T1-T2 difference in focus, $t(9) = 2.846$, $p. = .019$. Finally, the speaking task was perceived, on a 10-point scale (-5 = too easy, +5 = too hard), as one full point (10%) easier in T2 ($M = -3.20$, $SD = 1.3$) than T1 ($M = -2.20$, $SD = 1.8$). This difference, however, was not statistically significant. Unlike the TR condition, it appears that the PR condition of the speaking task significantly enhanced the flow experience.

Regarding the PR condition of the writing task, the one percent (1%) increase from T1 ($M = 84$, $SD = 9.7$) to T2. ($M = 85$, $SD = 13.7$) was insignificant. Upon inspection of the flow component ratios, it appears that the learners were somewhat (6%) more interested in the task in T2 ($M = 89$, $SD = 14.6$) compared to T1 ($M = 84$, $SD = 13.1$), but this interest was counterbalanced by a six-percent drop in the perception of control from T1 ($M = 82$, $SD = 10.4$) to T2 ($M = 77$, $SD = 17.7$). Concerning task difficulty, it was perceived as being about 12% more difficult at T2. A Wilcoxon signed-rank test reveals that this T1-T2 difference in task difficulty was statistically significant, $Z = -2.308$, $p = .02$. Contrary to the flow enhancing qualities of the PR condition of the speaking task, the PR condition of the writing task appeared to leave the flow experience largely unaltered.

In order to obtain a more nuanced portrait of these learners' flow experience in both task repetition conditions the next section presents qualitative data on learners' perceptions toward the tasks in general and toward the task repetition condition they experienced. We limit our discussion to the themes that emerged in relation to task repetition and flow.

Qualitative Results

Our analysis of the open-ended items of the task appreciation questionnaire turned around four themes related to flow: Interest, comprehension of task procedures, language learning, and control.

Interest Towards the Task

Reflecting the quantitative analyses presented in the previous section, the qualitative data show that the participants from the TR group experienced decreasing flow and interest when repeating the identical task. Some learners considered it to be acceptable to repeat the same task and same content but expressed less enthusiasm. Valerio wrote: "It is sometimes boring because we didn't change the countries neither the data we were looking for." Francis wrote that completing the same task twice is "getting less fun" and added that he would not appreciate repeating the same task a third time. Similarly, Ignacio responded that "It was ok do it again" and that he would be interested in doing more English activities, as long as "there was new activities, not repeating the same." One participant, Luc, mentioned that the task became too predictable, but specified this element for the speaking component

only: "getting more bored for the speaking part." Similar comments were not identified by the participants from the PR group. Two participants, Michel and Diana even expressed the desire to do these types of activities more often but did not make any specific remarks pertaining to the task modality. Such enthusiasm and the absence of comments regarding boredom in the PR qualitative data corroborate the significant increase in flow and interest observed in the quantitative data for the speaking task in the same condition.

Comprehension of Task and Task Goals

Previous task repetition research motivated our belief that repeating an identical task, or an identical task procedure would reduce potential confusions with the task goals and procedures and, consequently, increase the quality of the flow experience. We indeed found evidence that identical task repetition benefited the participants, more specifically, they found the tasks to be less difficult:

> "The second time was more easy because I know what I need to do" (Julia-TR).
> "It makes easier the job for the second time because we know what we are going to do. There is not a surprise" (Elisabeth – TR).
> "The second time, the task was easier because I understand the purpose of the exercises" (Isabela - TR).

Additionally, understanding what was expected of them appeared to have enabled them to execute the task more efficiently, as evidenced by these excerpts:

> "Pros: Faster and more productive, more efficient. The fact that we were more use to is, which lead us to a better execution of the oral task" (Luc - TR).

> "The thing we have to do was more clear and also the time spent to discover each country was more equal" (Nina-TR).

Similar comments were infrequent in the PR group with only one student commenting that the task requirements were clearer. Leslie explained: "As I was familiar with the assignments, I think I did the tasks better than the first time. I didn't catch the comparison part last time, so now I was focused on that." Instead, it was mentioned that the task goals and procedures continued to pose a challenge. For instance, Eva wrote: "It was easier, but I think both time we didn't done it right (not asking direct questions, we didn't stick to the scenario, we have kind of mixed-up things in the writing part"). These observations are in line with the quantitative data, wherein perceptions of control remained constant from T1 to T2 in both conditions, while interest and focus decreased in the TR condition and increased in the PR one. It appears that both conditions contribute to comprehension of task and task goals, which translates into a stable perception of control, while interest and focus vary between conditions.

Task Repetition and Language Learning

Overall, few comments were shared regarding the impact of repeating tasks on their language skills. In the task repetition group, for instance, vocabulary learning opportunities were discussed by only two participants. Isabela made this comment: "I liked that I was able to enrich my vocabulary, make the revision of spelling of some words. The task makes you use some kind of vocabulary which you repeat several times and remember better."

Despite having a writing component, only one comment was made in relation to writing and learning. One student, from the procedural repetition group, observed that writing a similar type of text at T2 was useful to her such that she was able to transfer her writing strategies: "I liked remember to the last activity and write the information and develop the strategies for write" (Maria). Overall, the participants did not attribute language learning benefits to the production of collaborative texts on repeated occasions.

Modality Effects and Flow

The participants were asked to share their opinions about repeating the oral and the written activities. We found that the participants expressed some modality-specific frustrations. In a first instance, regardless of the task repetition condition, participants expressed their frustration with the element of collaborative writing. Specifically, a recurring notion was a loss of control when doing the collaborative writing. Unless they were the writers, they sometimes felt that their voice was not heard. These observations, while not directly relevant to task repetition, show an interesting interaction between task modality and flow. Not having control during task completion was a concern for some of the members from each dyad:

> "If you don't have the pencil, your opinion is only a recommendation" (PR: Louisa).

> "I don't have control over the writing part like last time, maybe the writing process is complicated when it's shared" (TR: Gabe).

> "It's difficult to do it with other. It's because if I start writing, there are not chance to separate it" (TR: Mai).

These comments are quite insightful when interpreting the finding in the quantitative data that learners experienced an increase in flow only during the speaking task of the PR condition. Indeed, the flow experience in the PR writing task was mitigated by decreasing perceptions of control and focus, which might have been the result of unequal control between the scribe and the assistant during the collaborative writing portion of the tasks.

Discussion

The objective of the present study was to examine the effects of task repetition and procedural repetition on the flow intensity experienced by L2 learners as they carried out two pedagogical tasks. To respond to our research questions, 24 university-level EAL

learners were randomly assigned to either a task repetition (TR) or a procedural repetition (PR) condition. To measure the effect of task repetition on flow, participants completed questionnaires measuring the nature and intensity of the flow experience after completing two collaborative decision-making tasks, each containing an oral and a written component. Both tasks were associated with a relatively high intensity of flow experience ($M = 76/100$), which was about 10% higher than that observed by Zuniga and Rueb (2018) during 24 second language activities completed in a college classroom setting ($M = 69/100$). The results from the present study are, however, in line with those of Zuniga and Rueb (2018) when considering the average flow intensity score observed during the five collaborative activities of their study ($M = 74/100$). Taken together, these results seem to confirm that collaborative tasks can enhance the flow experience. These flow results also appear to corroborate claims that inclusion of pedagogical tasks that include interactive components positively impact L2 development (Loewen & Sato, 2018) and reduce learner anxiety (Dewaele, 2017). The finding that these particular decision-making tasks generated large amounts of flow is further evidence that supports the inclusion of two-way tasks in L2 learning contexts to create necessary conditions to reduce anxiety and increase the likelihood that learners engage with and process the input and output necessary for L2 development.

Our comparison of the flow experience in both repetition conditions revealed a complex portrait. In a first instance, the TR group demonstrated a slight decrease in flow at T2 and our analysis of the flow component ratios revealed that the decrease was primarily associated with the construct of interest. Learners lost some interest in the task the second time around. This pattern was further corroborated by the qualitative data of the present study and appears to mirror results from previous empirical studies, namely Payant and Reagan (2018), who also found that the TR condition unmotivated some learners. However, in the present study, we found stable scores for the construct of control and focus which suggests that although repeating identical content and procedures may decrease interest, it still enables learners to experience moderately high flow thus motivating them to push their own limits and still expand their skills in the target language.

The PR group, on the other hand, displayed significant changes from T1 to T2 in the intensity of their flow experience, however, only in the oral modality. A closer look at the flow component ratios revealed that there is value in repeating procedures as this leads to increases in learners' focus and interest, a finding that aligns with Kim (2013) who identified significant increases for topic interest in the PR group only. The identification of a 23% increase in focused attention and the 10% increase in interest during the oral modality alone is quite revealing since speaking tasks are known to require greater on-line processing compared to writing tasks. When speaking, learners have limited time to plan and edit their output and may not be able to access their declarative knowledge (Dekeyser, 2018; Ellis, 2003) which requires more sustained focus in order to achieve their communicative goals. Increased attention is also a necessary condition for L2 development (Schmidt, 2001) and speech production performance (de Bot, 1992; Kormos, 2006; Robinson, 2005).

From a Flow Theory perspective, one might argue that the PR condition helped alleviate some procedural difficulties experienced with the task in T1, thus bringing the activity into what Csikszentmihalyi (2008) refers to as the "flow channel," that is the balance between learners' skills and the challenges posed by the task. According to Flow Theory (Csikszentmihalyi, 2008), this skill-challenge balance is essential for maintaining

focused attention, because tasks whose challenges exceed capacity can trigger anxiety, a negative emotion that restricts attentional resources and the number of thought-action patterns that come to mind as individuals divert those resources to resolving the anxiety-triggering issues (Eysenck, 1979; Fredrickson, 2001, 2013; Fredrickson & Branigan, 2005). Likewise, tasks where the challenge falls below skill levels, trigger boredom and disperse attentional resources as learners' minds wander away from the task. Flow Theory would suggest that the introduction of new content in the PR condition counterbalanced the practice effect engendered by task repetition, increasing interest and preventing the signs of boredom observed in the TR condition.

Turning to the writing component of the task, we did not identify any significant differences in flow between T1 and T2. However, the component ratios for the PR group showed that at T2, the participants were in fact more interested, but both groups appeared to feel less focused and less in control. The greater increase in interest during the writing task for the PR group reflects the same trends observed for the oral task in the same group. It appears that the introduction of new content increased interest. The explanation for such a drop in control for both groups might be understood through the study's qualitative data, which underscored certain characteristics of the collaborative nature of the writing task. Collaborative writing is the product of two or more writers contributing to a single document and the result is joint ownership (Storch, 2011, 2019). Under collaborative pair dynamics, both learners would be engaged in the co-construction of the task with each individual adding, modifying, and extending the written product (Storch, 2011, 2019). In this study, although we did not analyze pair dynamics, the qualitative comments suggested that some dyads were not collaborative in that only one participant held control of the writing. Control is a key component of Flow Theory, and the perception of a loss of control can result in negative emotions such as frustration and anxiety (Pekrun, 2006), which can in turn restrict attentional resources (Fredrickson, 2001, 2013; Fredrickson & Branigan, 2005) and reduce the quality of the overall flow experience (Csikszentmihalyi, 2008). Indeed, some participants felt as though they were mere observers of the writing task, thus negatively impacting their flow experience.

Our findings suggest that task repetition for writing is important, as evidenced by the increase in interest, but it is equally important to model collaborative writing behaviours to foster a more positive experience. Collaborative behaviours can include requests, explanations, repetition, and collaborative dialogue (Storch, 2002). As such, careful consideration of the formation of dyads appears to be essential for the successful implementation of task repetition. For pedagogues, one way to mitigate the negative impacts of TR is the formation of new dyads on a subsequent trial. Similarly, working on developing successful collaborations may also be an important factor, especially when repeating the writing task.

Limitations and Future Directions

The present research offers new insights into task repetition research by drawing on the construct of flow, which is operationalized along four discernable dimensions: interest, skill-challenge balance, control and attention. Maintaining learners in a state of flow appears to be mediated by procedural repetition and task repetition does not appear to have an impact on flow (neither positive nor negative). While previous research has shown spacing effects on language performance (Bui, 2014; Suzuki & Sunada, 2020), it would be

interesting to examine whether the time between each repetition would mediate flow intensity with language learners. While the present findings are encouraging as they offer new insights into task repetition research, some limitations should be acknowledged. For instance, we did not enforce the distribution of roles during the writing tasks such that some participants assumed the role of the scribe throughout the tasks. To gain a clearer portrait of flow during collaborative writing tasks, future studies may want to control for such role distribution. Also, the implementation of the tasks was not counterbalanced in that all participants first completed the *Traveling Abroad*. Future research could manipulate this variable and counterbalance the tasks to avoid task effects. Finally, no measures of language development were implemented in this study and thus the relationship between flow and language development remains to be explored.

      To conclude, this study on task repetition is the first to draw on Flow Theory to examine how learners respond to repeating collaborative tasks in both the oral and written modalities. While task repetition did not appear to influence flow, either positively or negatively, procedural repetition appeared to enhance it, but only in the oral modality. From a pedagogical standpoint, we learn that developing new content using similar tasks can benefit learners' language learning experiences.

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Note

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[1] Note that the sample sizes between the two conditions are not the same: TR ($N = 14$), PR ($N = 10$). As a result of campus closing in March 2020 due to Covid-19, we were unable to obtain the data from the last two dyads in the PR condition.

Acknowledgements

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