TASK-TYPE AND VOCABULARY-RELATED DIFFICULTY IN CMC

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Abstract

The current study addresses whether features of task design, such as type of task and vocabulary-related difficulty, can promote processes facilitative of language development. In particular, we examine how these two features promote the exchange of information, the use of negotiation routines, and of L1- and L2-based communication strategies. 196 learners of Spanish worked in pairs via an online chat to complete either a jigsaw or a decision-making task that included vocabulary classified as appropriate or inappropriate for their level. The statistical analyses performed indicated that both independent variables, task type and vocabulary difficulty, contributed significantly to L2-based communication strategy use, but only task type had an effect on the other discourse aspects that were measured, namely, exchange of information and negotiation of meaning.

Key words: interaction, task, negotiation of meaning, communication strategies, vocabulary acquisition

RESUMEN

Este estudio investiga si algunos rasgos del diseño de las tareas, como el tipo de tarea y la dificultad relacionada con el vocabulario, pueden desencadenar procesos que faciliten el desarrollo lingüístico. En concreto, examinamos cómo estos dos rasgos promueven el intercambio de información, el uso de prácticas de negociación de significado y las estrategias de comunicación. 196 estudiantes de español trabajaron en parejas, por medio de un chat, para realizar una tarea colaborativa tipo jigsaw *o bien una de toma de decisión que incluían vocabulario previamente clasificado como apropiado o inapropiado para su nivel. Los resultados de los análisis estadísticos indicaron que las dos variables independientes, tipo de tarea y dificultad relacionada con el vocabulario, contribuyeron significativamente al uso de estrategias basadas en la L2. Sólo la variable tipo de tarea mostró un efecto sobre los otros aspectos discursivos que se midieron, el intercambio de información y la negociación de significado.*

PALABRAS CLAVE: interacción, tarea, negociación de significado, estrategias de comunicación, adquisición de vocabulario

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Introduction

In the last two decades the interactionist view of second language acquisition (SLA) has grown into a burgeoning field of research as evidenced by the number of special issues on the topic that have come to light (see Alcón-Soler & García Mayo, 2009; García Mayo & Alcón-Soler, 2002; Gass, Mackey & Pica, 1998; Mackey & Gass, 2006). This research has focused on identifying and explaining how interaction provides the conditions and processes that have been claimed to facilitate language learning. Research on negotiation of meaning (Gass & Varonis, 1985; Long 1983b; Varonis & Gass, 1985) was one of the first to point to the various kinds of opportunities that interaction provides for L2 development, that is, the opportunities to receive comprehensible input, to gain feedback on production, and to modify interlanguage output. Subsequent research (Pica, 1994; Long, 1996) further explored how the process of negotiation can draw learners' attention towards a problematic linguistic item, thus increasing input comprehensibility and the opportunity to notice gaps in their interim language system.

While negotiation of meaning is closely linked to comprehension difficulties, learners are often faced with production problems and resort to communication strategies (CSs) to circumvent them (*e.g.*, Dörnyei & Scott, 1995, 1997). As with negotiation, CSs help to overcome communication problems and to move the conversation forward. Similarly, they can make learners conscious of gaps in their knowledge of the target language and predispose them to selectively process the input. From this point of view, like negotiation, CSs can trigger processes conducive to learning by making salient certain linguistic features that are either unknown or not available to the learner for productive use (Kasper & Kellerman, 1997).

The increasing interest in the role of interaction to facilitate language acquisition brought to the forefront of research and teaching the importance of task design features in providing an acquisition-rich interactive context (Crookes & Gass, 1993a, 1993b; Ellis, 2003; Nunan, 2004). Several researchers drew attention to crucial task design features (Doughty & Pica, 1986; Gass & Varonis, 1985; Long, 1981, 1983a, 1983b; Loschky & Bley-Vroman, 1993; Pica, Kanagy & Falodun, 1993) that determine what information is to be exchanged and how interactants deal with such information. Yet, research (García Mayo, 2007; Mackey & Gass, 2006) points to the fact that the variable task type is not easy to operationalize given the array of task features that need to be carefully considered. Hence, when

designing studies to investigate how different types of tasks contribute to generating interaction and negotiation, such features should be carefully considered and controlled for.

The study of language acquisition through interaction has been carried out mainly in face-to-face oral interaction. Recently, research has paid attention to the possible impact of various technologies on the language learning process and suggests that certain aspects of Computer-Mediated Communication (CMC) may have a positive effect on acquisition (for a review see Chapelle, 2001, 2003). However, not much research has examined the effect of particular task design features on learners' interactive use of language in CMC. In this study, we focus on the potential contribution to the SLA process of two task-design variables, by examining how they promote target language production or output, the use of negotiation routines, and of CSs.

Interaction, tasks, and Computer-Mediated Communication (CMC)

Communication tasks have been proposed to be a particularly appropriate tool both to assist language learning and to study the processes of SLA (Pica, Kang & Sauro, 2006; Pica, Kanagy & Falodun, 1993). Pica *et al*. (1993) propose a framework that attempts to define the construct of communication task and to differentiate among types of tasks by taking into account their potential contribution to language learning. In this framework the jigsaw is hypothesized to generate the most opportunities for negotiation of meaning, because interactants hold different portions of the information needed to complete the task and must work toward a convergent single goal. Towards the opposite end of the continuum would be the decision-making task, a task with a convergent goal but more than one outcome options. In this task, each interactant has access to the same information, and thus could arrive at a possible solution on her own.

Long (1981, 1983a) and Doughty and Pica (1986) found that two-way tasks (*i.e.*, where all participants supply and request information) resulted in more negotiated interaction than one-way tasks (*i.e.*, where only one participant supplies the information). Gass and Varonis (1985), however, observed that the predicted advantage of two-way tasks was blurred when tasks differed along other dimensions such as the amount of task background shared by participants as well as the type of output that the tasks involved (*e.g.*, picture drawing versus oral tasks).

Similarly, Shortreed (1993) and Fernández-García (2007) found that less shared background led to more negotiation of meaning.

In other words, the variable task type may vary along several dimensions, such as directionality, information exchange requirement and shared background. Previous studies point to the need to consider the contribution to task-generated negotiation of other features that have not always been controlled for (*i.e.*, type and amount of information involved, type of output required). Hence, when designing studies to investigate how different types of tasks contribute to generating interaction and negotiation, such features should be carefully considered, together with the interactional activity and the communication goal requirements described in Pica *et al*.'s framework.

While the study of language acquisition through interaction and the use of communication tasks have been carried out mainly in the oral mode, some research has also paid attention to the possible impact of the classroom use of CMC on the development of learners' interlanguage. This research line has, at the same time, helped to delineate a framework for task design in the synchronous CMC environment (Hampel, 2006).

Early studies on written CMC (Beauvois, 1992; Kelm, 1992; Kern, 1995; Sullivan & Pratt, 1996; Warschauer, 1996) indicate that CMC favors a more equal participation pattern than oral discussions and, thus, it allows all students to engage in the process of input comprehension and output production. CMC also seems to afford more opportunities for learner-generated output than oral discussions (Kern, 1995), though it may be contingent on group size (Sullivan & Pratt, 1996). Nevertheless, some research (Kern, 1995; Warschauer, 1996) found that CMC resulted in less coherent and interactive discourse than oral discussions, particularly with large groups. More recent research has identified similarities in discourse functions (Sotillo, 2000), and more complex language in written CMC than in oral face-to-face communication (Payne & Whitney, 2002).

Fernández-García and Martínez-Arbelaiz (2003) examined dyad conversations in Spanish L2 and found that discourse development was comparable across the oral and CMC mediums. This similarity was possible because, contrary to what happens in CMC group discussions, in which there are multiple and sometimes interrelated topic threads, in the interaction of dyads, there is a single line of conversation. The task used in this study was an open one and allowed the participants to have some control over the information to be exchanged. The effect of the interactants' common

background is probably lessened when using closed tasks, with a specific information-exchange requirement to achieve task completion. Support for this prediction is found in two studies (Blake, 2000; Pelletieri, 2000) of Spanish L2 CMC interaction that showed that jigsaw tasks provided more opportunities for negotiation than open tasks. In addition, Pelletieri (2000) noticed that one of the jigsaw tasks in her study produced more negotiations of meaning than another jigsaw task with a very similar design. She attributed these different results to the level of task difficulty in terms of the vocabulary that was needed to complete the task.

Smith (2003) found that intermediate English as a second language (ESL) learners engaged in more negotiation when completing decision-making tasks as compared to jigsaw tasks. These results may a priori contradict those of previous CMC studies as well as those for similar tasks carried out orally (Doughty & Pica, 1986). Nevertheless, a design feature of the decision-making task (*i.e.*, the required identification of the unknown lexical items held by each dyad member) might partially account for the results obtained in Smith's study.

In a subsequent CMC study, Smith (2004) found that learners' recurrence to negotiated interaction to clarify the targeted lexical items was more frequent and led to significantly better retention of such vocabulary items than the use of a preemptive input strategy (*i.e.*, when learners provided a description anticipating that a lexical item could be problematic for the interlocutor), and also superior to not using or engaging the targeted vocabulary items. Adding to previous research that suggested a connection between negotiation and linguistic development (*e.g.*, De la Fuente, 2002; Ellis, 1995; Ellis & He, 1999; Ellis, Tanaka & Yamazaki, 1994; Gass & Varonis, 1994; Loschky, 1994; Mackey, 1999), Smith's results are supportive of the interactionist perspective of SLA (Long, 1996) as they provide evidence of a direct relationship between negotiation and second language development. Furthermore, a recent meta-analysis of 14 task-based interaction studies (Keck, Iberri-Shea, Tracy-Ventura & Wa-Mbaleka, 2006) found "evidence of an empirical link between interaction and L2 acquisition" (p. 124) and suggests that "task design features can moderate the learning benefits fostered by task-based interaction" (p. 124).

Attention, negotiation of meaning, and communication strategies (CSs)

In view of the evidence on the role of negotiated interaction in the process of acquisition (Gass, 1997; Mackey, 1999; Mackey & Gass, 2006), research that

attempts to elucidate the task characteristics that favor negotiation remains a fruitful venue of investigation. Attention has been a central construct in the study of the SLA process (Gass, 1988, 1997; Schmidt, 1990, 1995, 2001; VanPatten, 1990, 1996; VanPatten & Williams, 2006). As pointed out in the interactionist literature, negotiation routines provide an appropriate context for learners to notice gaps in their knowledge of the L2 because they allow them to focus their attention to relevant linguistic items. Negotiated interaction affords both interlocutors opportunities to attend to problematic linguistic item/s while engaged in decoding and encoding messages.

In interaction exchanges, a learner may experience problems while encoding a message. In these cases, learners may resort to the use of communication strategies (CSs), that is, a subtype of problem-solving devices to compensate for "*resource-deficits* or gaps in speakers' knowledge preventing them from verbalizing messages" (Dörnyei & Scott, 1997: 183). These problem-solving devices have an obvious role in L2 communication, what is more, researchers have argued for a close link with L2 acquisition on the basis of "SLA theories which emphasize the roles of input, output, feedback and cognitive processing" (Kasper & Kellerman, 1997: 7).

As with negotiation, the use of CSs may act as a *priming device* in the process of acquisition by which learner's attention is directed to items or aspects of the L2 that are unknown to her. By using CSs the learner is pushing her linguistic resources and, in producing this *pushed output*, her awareness of linguistic gaps is raised, thus, setting the path toward acquisition (Swain, 1985, 2000). The use of CSs allows the speaker to move the conversation forward and to keep the channel of communication open, thus generating new opportunities for both interlocutors to comprehend, negotiate, modify messages and provide useful feedback. In Long's words, all these interactional adjustments may facilitate acquisition because they connect "input, internal learner capacities, particularly selective attention, and output in productive ways" (Long, 1996: 451-452).

Though a good deal of research has been dedicated to investigate negotiation and CSs, not much is known about the specific conditions under which learners resort to each. In this study, we examine how characteristics of the tasks, such as task type and task difficulty related to vocabulary familiarity, may influence learner's recurrence to either negotiation or CSs. The section that follows presents a review of the literature on CSs relevant to the issues addressed by this study.

Communication strategies in SLA

Under the so-called 'traditional view', CSs have been defined as "a subtype of L2 problem-management efforts, dealing with language production problems that occur at the planning stage" (Dörnyei & Scott, 1997: 177). In this view, CSs are considered independently from other types of problem-solving devices, such as meaning-negotiation and repair mechanisms, that are used to deal with problematic utterances, and whose study, as Yule and Tarone (1991) pointed out, has been independent of CSs research. Dörnyei and Scott (1997), elaborating on their previous work (Dörnyei and Scott, 1995), found that on an analysis of 9 published taxonomies of CSs, 6 of them show many similarities and could, therefore, be reduced to a core group of strategies. Three of the taxonomies studied recognize the achievement-reduction duality, while the rest covers only achievement strategies.

In the present study, we focus on achievement strategies, that is, on those CSs that entail an expansion of the learner's linguistic resources. Faerch and Kasper (1983) pointed out that these strategies, rather than those that are used to adjust or abandon the original content (known as reduction strategies or avoidance strategies), are the ones that can bolster the language learning process. Through the use of achievement strategies, the learner expands her communication resources without abandoning the interlanguage system and gets new opportunities to formulate hypothesis about the L2.

The position adopted in this study is that one of the ways in which learners acquire language is by being confronted with the need to produce pushed output (Swain, 1997), and that CSs allow them to stretch their linguistics resources to do so. At the same time, with the use of CSs learners may or may not obtain feedback that provides new linguistic information, given that provision of feedback is contingent upon the interlocutor's knowledge, skills, as well as other contextual factors. For example, in communicative, learner-centered classrooms that favor group and pair work, learners may not always receive feedback that is tailored to their needs because their level of proficiency tends to be rather homogeneous. Though this could be perceived as a potential drawback to the proposed benefits of the use of CSs in learner-learner interaction, we argue that by using CSs learners self-initiate a necessary cognitive process that, if supported by further opportunities for focused processing of appropriate comprehensible input, can lead to

acquisition. Yet, little is known about the specific factors that contribute to create contexts where CSs are prone to occur.

The present study

In an attempt to expand this line of research, in the current study, we carefully manipulated the design of two tasks, a jigsaw and a decision-making, by varying two task characteristics: the goal of the task (*i.e.*, open versus closed) and the level-appropriateness of the vocabulary. We examined how the latter two variables related to the amount of learner-generated output, to the use of negotiation and to the use of CSs, as outlined in the section that follows. The specific research questions addressed by this study were:

- How much output will be produced depending on either variable?
- Will the amount of CSs vary depending on each variable?
- Will those CSs be used to refer to the targeted vocabulary items across conditions? Additionally, and following some indications in the literature that the use of L1- and L2-based CSs may respond to different factors, we examined these two groups of CSs independently.
- How much negotiation will be fostered depending on either variable?
- How much negotiation will focus on the targeted vocabulary items depending on either variable?

Method

Participants

Twelve entire sections of fourth-semester learners of Spanish at a big Midwest university participated in the study. Participants completed a background questionnaire that allowed the researchers to consider any previous language experiences that might influence their performance in the tasks of the study. All participants included in the final pool were native speakers of English. The final pool of participants was 196 (98 dyads). Dyads with fewer than 150 words of total production were eliminated because their data showed that they did not attempt to carry out the task.

Network tool

The software program used was a real time discussion tool called Chatnet.[1] Though synchronous, the Chatnet environment is different from an oral conversation in that users usually take some time to read and compose their messages. That is, there exists some pressure to keep the conversation going but the slower pace and the relative permanence of the online written text (*i.e.*, up to three lines in each turn) affords conversational partners additional time to process the target language when coding and decoding messages. This longer processing time associated to text-based on-line chat has been found to promote noticing of the learner's own problematic output and of the interlocutor's feedback (Lai & Zhao, 2006).

Tasks

Two types of tasks were included in the study. Following Pica *et al*.'s (1993) taxonomy, one of the tasks of this study falls under the category of *jigsaw task*, and the other under the category of *decision-making task*. In the jigsaw task, each interactant was given a page with four drawings of different people. Of the four drawings, two were identical for both interactants, and two were slightly different. The goal of the task was to identify the drawings that were different, and to determine what the differences were. In the decision-making task, each interactant received a set of six drawings of people. The set was identical for both interactants. The goal of the task was to rank the people in the drawings according to the appropriateness of their physical appearance and outfit for a particular job, and to explain why a given ranking was chosen.

There were two versions of each task. One version (easy version) included drawings with physical features and outfits that could be described using vocabulary practiced in beginning and low-intermediate courses. The second version (difficult version) included physical features and outfits whose description would need vocabulary beyond the coverage of beginning and low-intermediate courses (see the section on Target vocabulary below). The drawings used were identical across tasks. A small pilot study with several dyads of native speakers was carried out to ensure that the tasks could be successfully completed.

[1] For more information visit: <http://ed.fnal.gov/lincon/tech_com_chatnet.shtml>.

In designing the tasks, we paid careful attention to the task essentialness feature as defined by Loschky and Bley-Vroman (1993). Both versions of the jigsaw tasks were designed so that production and comprehension of the target vocabulary were required to complete the task successfully. It was predicted that when dealing with level-inappropriate vocabulary participants would experience more problems expressing and comprehending ideas and would, therefore, resort to CSs and negotiation of meaning more frequently than when dealing with level-appropriate vocabulary. In other words, the target vocabulary was task-essential in the jigsaw task because it was not possible for participants to achieve their shared goal without producing and understanding it. Because the decision-making task is an open task, there existed the possibility that participants could manage to arrive at a common decision without necessarily using all target vocabulary.

Target vocabulary

Figure 1 presents the list of descriptions required to identify the identical drawings in each version of the closed task (jigsaw), the level-appropriate version and the level-inappropriate version. For example, in the level-appropriate version of the jigsaw, dyad members have to share the information listed in the left column to be able to determine that one of the identical drawings they hold is number 1 for one dyad member and number 3 for the other one.

FIGURE 1. Targeted descriptions for the two identical drawings of the two versions of the closed task (jigsaw)

LEVEL-APPROPRIATE VOCABULARY (1=3)	LEVEL-APPROPRIATE VOCABULARY (3=1)
– *Calvo* 'bold' – *Pelo rizado* 'curly hair' – *Gafas redondas pequeñas* 'small round glasses' – *Camisa con estrellas* 'shirt with stars' – *Dos dientes arriba* 'two teeth in the upper part of the mouth'	– *Pelo largo* 'long hair' – *Gafas redondas grandes* 'big round glasses' – *Dos dientes abajo* 'two teeth in the bottom part of the mouth' – *Un pañuelo de rayas/en el cuello* 'a striped scarf'
LEVEL-INAPPROPRIATE VOCABULARY (1=3)	**LEVEL-INAPPROPRIATE VOCABULARY (3=1)**
– *Melena* or *pelo suelto* 'long hair worn down' – *Trenzas* 'braids' – *Collar de dos vueltas de perlas* 'two-strand pearl necklace' – *Sin pendientes* 'without/with no earrings' – *Sin arete de nariz* 'without nose ring'	– *Moño* or *pelo recogido en un moño* 'bun' – *Tres prendedores/ganchos* 'three hairclips' – *Banda* or *cinta en el pelo* or *la frente* 'a hairband/a headband' – *Pendiente de colgar en la oreja izquierda* 'earring with a pendant in the left ear' – *Arete en la oreja derecha* 'ring-shaped earring in the right ear' – *Collar de dos vueltas y con colgante* 'two-strand necklace with a pendant'

Figure 2 presents the list of descriptions that allow dyad members to identify the different drawings in each version of the closed task (jigsaw). All the level-appropriate vocabulary was covered by the first-year textbook (*Dos mundos*, by Terrell *et al*., 1998), while what we consider level-inappropriate vocabulary was addressed neither by the first-year textbook nor by the second-year textbook (*¿Qué te parece…?*, by Lee *et al*., 1999). Regional variations were counted as correct (*gafas*, *lentes* or *anteojos* for 'glasses').

FIGURE 2. Targeted descriptions for the two different drawings of the two versions of the closed task (jigsaw)

LEVEL-APPROPRIATE VOCABULARY (2≠2)	LEVEL-APPROPRIATE VOCABULARY (4≠4)
– *Liso/lacio* 'straight hair' – *Gafas negras rectangulares* 'black rectangular glasses' – *Dos dientes abajo* vs. *sin dientes* 'two teeth in the bottom part of the mouth' vs. 'without/with no teeth' – *Bufanda de rayas* vs. *corbata con círculos* 'a striped scarf' vs. 'polka dotted tie'	– *Pelo largo* vs. *pelo corto rizado* 'long hair' vs. 'short curly hair' – *Gafas pequeñas redondas* vs. *gafas rectangulares* 'small round glasses' vs. 'rectangular glasses' – *Dos dientes arriba* vs. *dos abajo* 'two teeth in the upper part of the mouth' vs. 'two teeth in the bottom part of the mouth' – *Bufanda de flores* vs. *camisa con círculos* 'scarf with flowers' vs. 'polka dotted shirt'
LEVEL-INAPPROPRIATE VOCABULARY (2≠2)	LEVEL-INAPPROPRIATE VOCABULARY (4≠4)
– *Melena* or *pelo suelto* 'long hair worn down' – *Tres plumas* 'three feathers' – *Banda en el pelo* 'hair band/headband' – *Arete de nariz* 'nose ring' – *Arete en la oreja derecha* vs. *en la izquierda* 'ring-shaped earring in the right ear' vs. 'in the left ear' – *Collar de tres* vs. *cuatro vueltas* 'three-strand necklace' vs. 'four-strand necklace'	– *Tres coletas* vs. *tres alfileres de moño* 'three ponytails' vs. 'three bun hairpins' – *Collar con colgante* vs. *sin colgante* 'necklace with a pendant' vs. 'without a pendant' – *Un arete en cada oreja* vs. *uno en la izquierda y un pendiente de colgar en la derecha* 'a ring-shaped earring in each ear' vs. 'one in the left ear and an earring with a pendant in the right ear'

Data collection

Participants were randomly assigned to form dyads within each course section. Likewise, tasks were distributed randomly, and as evenly as possible among dyads in each section, so that approximately one fourth of them would complete one of the following: 1) the difficult version of the closed task (jigsaw); 2) the easy version of the closed task (jigsaw); 3) the difficult version of the open task (decision-making); and 4) the easy version of the open task (decision-making). The final distribution was 30 dyads in the difficult jigsaw, 25 in the easy jigsaw, 20 in the difficult decision-making, and 23 in the easy decision-making.

Immediately after completing the task, participants filled out a background questionnaire about their previous language experience. All the data was collected within participants' regular 50-minute class period.

Coding of the data

Two measures were used to determine the amount of output generated in completing a task: number of words and number of turns. A change of speaker in the transcripts was considered to mark the beginning of a new turn. Therefore, the string of words sent before the other partner intervenes again would constitute a turn in this study.

Likewise, to determine the amount of negotiation that emerged in each condition, instances of negotiation were identified and counted. We followed Varonis and Gass' operationalization of the construct of non-understanding routines as "exchanges in which there is some overt indication that understanding between participants has not been complete" (Varonis & Gass, 1985: 73). These exchanges occur when one interlocutor indicates (*indicator*) in an overt way that the other's preceding turn (*trigger*) has not been successfully understood, and the other interlocutor provides additional information in a subsequent turn (*response*). The two researchers identified and coded independently all instances of negotiation in the data. There were discrepancies only in 6% of the cases and those were discussed until a 100% agreement was reached.

CSs were identified by a research assistant that was previously trained to carry out this phase of data coding. Subsequently, the two researchers independently classified all strategies into the categories described below. The discrepancies (8%) were discussed until a 100% agreement was reached. The taxonomy adopted to code and classify CSs was similar to the one used by Liskin-Gasparro (1996), which included achievement CSs from previous research (Bialystok, 1983; Faerch & Kasper, 1983; Tarone, 1983), and the categorization into L1- and L2-based CSs. The classification system included the following categories:

CSs based on the L2

1) *Approximation*. Use of an L2 word that is related to the target word from a semantic point of view but not appropriate in the particular context in which

it is used. It could be a generalization or a synonym, for example, *la gente*, 'the people', instead of *la persona*.

2) *Circumlocution/description*. Use of explanations or descriptions to refer to the unknown L2 word/phrase. Example: *no tiene pelo encima de su cabeza*, 'does not have hair on top of his head', to refer to *calvo* 'bold'.
3) *Word coinage*. Use of a made-up word that conceptually originates in the target language and that conforms to the L2 morphology. Examples: *los lejos* to refer to *las gafas/anteojos*, 'the glasses'.

CSs based on the L1

1) *Transliteration/foreignization*. Use of a word that originates in the L1 but does not exist or has a different meaning in the L2. Example: *el tipos* for *las puntas*, 'the tips (of the hairpins)'.
2) *Code-switching*. Use of an L1 word without any attempt to translate it or adapt it to the L2 morphology. Example: *no tengo chica con* pins *en su pelo*, 'I do not have girl with *pins* in her hair' to refer to *prendedores*, 'hairclips'.
3) *Appeal for help*. One of the participants requests help when she does not know or is unsure of how to express something in the L2. Participants resorted to indirect and direct questions. Example: *fábrica no era la palabra, ¿verdad?*, 'factory was not the word, right?' trying to refer to *tela* 'fabric'.[2]

Analyses and results

Output

Words. The jigsaw word counts had larger means (easy jigsaw = 368.2, difficult jigsaw = 433.5) than the decision tasks (easy decision = 309.7, difficult decision = 286.4) but also larger standard deviation (easy jigsaw = 154.6, difficult jigsaw = 178.3) than the decision tasks (easy decision = 93.5, difficult decision = 84.3). The results of a negative binomial[3] analysis showed no significant[4] interaction

[2] Two CSs were counted, a transliteration for the use of *fábrica*, and an appeal for help.
[3] The negative binomial model reasonably fitted the increasing variance.
[4] For all analyses the alpha level was set at .05.

between type of task and vocabulary difficulty (z = 1.67, p = .09), nor were there significant differences for type of task (z = 1.69, p = .09), and for vocabulary difficulty (z = –.72, p = .47). However, as can be seen in Table 1, a negative binomial comparing task type alone[5] showed a significant effect (z = 4.11, p < .0001), indicating that the only perceivable difference came from the variable task type, with difficulty causing an imperceptible effect on the number of words used.

TABLE 1. Words: results of negative binomial for task type

	ESTIMATE	STANDARD ERROR	Z VALUE	P
Task type	0.30	0.07	4.11	< 0.0001

Turns. The means of the jigsaw tasks (easy jigsaw = 50.6, difficult jigsaw = 49.1) were higher than those of the decision tasks (easy decision = 42.9, difficult decision = 42), with the standard deviations of the jigsaws being also higher (easy jigsaw = 20.7, difficult jigsaw = 20.9 versus easy decision = 17.6, difficult decision = 16.1), though there is not a large difference. The results of a 2 X 2 ANOVA revealed no significant interaction (F = .005, p = .94), and no significant effect for task type (F = 3.5, p = .06), nor for difficulty (F = .10, p = .75), though participants' performance with the former was in the anticipated direction.[6]

Communication strategies

We examined all CSs in general and independently the group of CSs used to refer to the target vocabulary. Since the results were similar for both cases, we report here on the latter.

Communication strategies used to refer to target vocabulary. As was the case with total number of CSs, the mean use of CSs that involved the targeted vocabulary increases in the expected direction with the difficult jigsaw generating the highest number of strategies (7.5), followed by the easy jigsaw (5.4), the difficult decision (2), and the easy decision (0.7). As Table 2 shows, the results

[5] Since all the deviance was contained in the task type variable, a model comparing task type alone was considered appropriate.

[6] The jigsaw data has 1.2 times standard deviation compared to the decision data, and this higher spread could account for the lack of a significant effect for task type.

of an analysis using the poisson model[7] revealed a significant interaction for task type by vocabulary difficulty (z = –2.26, p = .02), and a significant effect for task type (z = 7.73, p < .0001), and for vocabulary difficulty (z = 3.54, p = .0004). These results suggest that the significant interaction is caused by the difficult jigsaw group not drawing on as many strategies as expected. That is, even though the difficult jigsaw group was the one with the most CSs to refer to target vocabulary, the amount of CSs of this group is about half the amount one would expect if the level appropriateness/task type effects were completely independent. These results indicate that, as predicted, both the level appropriateness of the vocabulary and the type of task had an impact on the number of CSs used to refer to the target vocabulary. Nevertheless, in the case of the difficult jigsaw, learners were able to accomplish the task with fewer CSs than expected.

TABLE 2. Communication strategies used to refer to target vocabulary: results of poisson model for task type and vocabulary difficulty

	ESTIMATE	STANDARD ERROR	Z	P
Task type	1.99	0.26	7.73	< 0.0001
Vocab. difficulty	1.02	0.28	3.54	0.0004
T. type x difficulty	–0.69	0.31	–2.26	0.02

L1-based communication strategies used to refer to target vocabulary. More CSs were used in the case of the jigsaw tasks (easy = 2.9, difficult = 2.4) than in the decision-making tasks (easy = .5, difficult = 1). As shown in Table 3, the results of a poisson model analysis revealed a significant interaction for task type by difficulty (z = –2.21, p = .027), a significant effect for task type (z = 5.55, p < .0001), and a significant effect for vocabulary difficulty (z = 1.96, p = .049). As with the total of CSs used to refer to the target vocabulary (that included L1 and L2 strategies), the significant interaction was caused by the difficult jigsaw group resorting to fewer L1-based CSs than expected.

[7] Several models were tested in the process of analysis. The poisson model was considered to be the most appropriate and chosen for all the analyses involving strategies.

TABLE 3. L1-based communication strategies used to refer to target vocabulary: results of poisson model for task type and vocabulary difficulty

	ESTIMATE	STANDARD ERROR	Z	P
Task type	1.79	0.32	5.55	< 0.0001
Vocab. difficulty	0.74	0.37	1.96	0.049
T. type x difficulty	–0.90	0.41	–2.21	0.027

L2-based communication strategies used to refer to target vocabulary. The results parallel those found when considering all CSs. The mean use of L2 strategies is higher for the jigsaw tasks (easy jigsaw = 2.5, difficult jigsaw = 5) than for the decision tasks (easy decision = 0.3, difficult decision = 1.1), and higher for the difficult version in each case. The results of a poisson model analysis (see Table 4) yielded no significant interaction ($z = –1.44$, $p = .149$) and a significant main effect for task type ($z = 5.31$, $p < .0001$) and for vocabulary difficulty ($z = 3.01$, $p = .002$).

TABLE 4. L2-based communication strategies used to refer to target vocabulary: results of poisson model for task type and vocabulary difficulty

	ESTIMATE	STANDARD ERROR	Z	P
Task type	2.27	0.43	5.31	< 0.0001
Vocab. difficulty	1.39	0.46	3.01	0.002
T. type x difficulty	–0.70	0.49	–1.44	0.149

Negotiation of meaning

The group means per task were slightly higher for the jigsaw tasks (easy = 1.1, difficult = 1.2) than for the decision tasks (easy = .7, difficult = .8), and only imperceptibly higher for the difficult versions of the tasks. In addition, given the number of dyads not using negotiations at all,[8] the data showed substantial deviation from the typical models. For this reason, it was considered more appropriate to look at the flat binomial difference, *i.e.*, the proportions of dyads using negotiations against those dyads not using negotiations, and test only the difference between the decision and jigsaw tasks, disregarding the difficulty variable. There

[8] When considering all negotiations, 45 dyads out of 98 total did not negotiate at all.

were 22 out of 43 dyads that did not use negotiations in the decision tasks and 23 out of 55 in the case of the jigsaw tasks. However, more dyads engaged in one or more instances of negotiation work when completing the jigsaws (32 out of 55) than when completing the decision tasks (21 out of 43). A two-way proportionality binomial test[9] did not yield any significant difference (X-squared = 0.51, df = 1, p = .47).

Negotiation used to refer to target vocabulary. As with all negotiations, the means of the jigsaw tasks (easy = 0.8, difficult = 0.6) were higher than those of the decision-making tasks (easy = 0.2, difficult = 0.3). Likewise, the same pattern[10] observed when considering all negotiations (*i.e.*, dyads not using any negotiation) was found when looking only at the negotiations used to refer to target vocabulary.[11] Therefore, subsequent analyses looked at the flat binomial difference and test only the difference between the decision and jigsaw tasks. Table 5 shows the results of a two-way proportionality binomial test, that yielded a significant difference for negotiations used across tasks (X-squared = 7.13, df = 1, p = .007).

TABLE 5. Negotiations used to refer to target vocabulary: two-sample test for equality of proportions with continuity correction

SAMPLE ESTIMATES		95%	CONFIDENCE INTERVAL	DF	X-SQUARED	P
0.16	0.44	–0.46	–0.08	1	7.13	0.007

DISCUSSION

Research has emphasized the importance of task design features in promoting interactive processes facilitative of SLA. This study provides evidence that task type as defined by Pica *et al*. (1993), and vocabulary-related task difficulty influence how much second language learners engage in some language-problem solving procedures, such as the use of CSs and, to a certain extent, the use of negotiation routines. Still, and not unlike previous SLA research (Plough & Gass, 1993), this

[9] This test reduces counts of 1, 2, 3, 4… negotiations to a 1+ column and compares variables only on a two-way scale.

[10] 67 out of the 98 dyads did not engage in negotiation involving the target vocabulary.

[11] The number of dyads that did not use negotiations that involved the target vocabulary was similar across tasks (decision = 36, jigsaw = 31); however, the number of dyads that did engage in negotiation work was considerably higher for the jigsaw tasks (decision = 7, jigsaw = 24).

study documents variability in performance, in particular, in amount of output measured as number of words, and in the use of negotiation routines.

Type of task made a difference in the amount of output that learners produced, with the closed task (jigsaw) resulting in more words and turns produced than the open task (decision-making), though, in the latter case, the difference did not reach significance. The effects of vocabulary difficulty on language output were barely noticeable in this study. Contrary to expected, participants did not use a significantly higher number of words to refer to the more difficult vocabulary as compared to the easy target vocabulary. Instead, the task information exchange requirement or lack thereof seems to account for participants' tendency to use longer and more elaborated utterances. That is, the jigsaw required that participants exchanged, verified information, and referred to details to make sure that the differences among drawings were identified. In contrast, participants that completed the decision-making tasks opted for reducing the communicative goal of the task and, therefore, arrived at a decision without engaging in a thoughtful discussion.

Therefore, as expected, the participants in our study benefited from the more highly constrained nature of the closed task, which encouraged them to comply with its pre-established requirements. Open versions gave them the option to choose on what to focus, and generated less output. Nevertheless, in view of the observed lack of engagement and the resulting rather limited discourse, we speculate that the open task may not have been challenging enough or that the participants were relatively unmotivated to get fully involved in carrying out this task. Lambert and Engler (2007) point out that motivation and level of proficiency are two factors that may need to be taken into account when interpreting learners' performance with closed and open tasks. Thus low motivation learners may benefit from closed tasks at any level of proficiency, however, "the freedom provided by open tasks may have negative effects on the performance of low-motivation learners who might use it to finish as quickly as possible without regard for precision…" (Lambert & Engler, 2007: 41).

The results for CSs clearly suggest that both task design features affected its use, especially, for L2-based CSs. That is, both the level appropriateness of the vocabulary and the type of task had the expected impact on the amount of CSs used (with more CSs with the closed task and with difficult vocabulary: difficult jigsaw > easy jigsaw > difficult decision-making > easy decision-making). This effect was observed when considering all CSs, and all L2-based CSs, and, in both

cases, when isolating those CSs used to refer to the target vocabulary. A somewhat different pattern was found for L1-based CSs.

Contrary to what was expected, in the case of L1-based CSs, more strategies were used with the easy jigsaw. This opposite behavior may help to explain why, when including all CSs for target vocabulary, the difficult jigsaw shows up as triggering the highest usage of strategies but still not as high as one would expect. While one possibility is that this task placed too many demands for learners to be able to surpass a given level of performance, it is more plausible, however, that participants' divergent behavior with L1-based CSs accounts for this finding. In fact, we did not find a clear-cut pattern of L1-based CSs usage comparable to that of L2-based CSs. That is, the results for all L2-based CSs closely matched those that isolated the strategies for target vocabulary, which was not the case for L1-based CSs.

In addition, a look at the codified strategies revealed a wider range of occurrence of L1-based CSs, that is, they were used to refer not only to the target vocabulary and to other lexical items but also to grammatical items. This observation led us to re-examine in which ways L1-based CSs were used to compensate for 'resource-deficit gaps'. In particular, in the case of the strategy we identified as code-switching, we found difficult to ascertain to what extent this use of the L1 made up for lack of appropriate L2-based resources or emerged as an outcome of regular bilingual functioning in the classroom. It is a reality of the foreign language context, most would agree, that shared knowledge of the learners' L1 results in some form of use of English by instructors and learners. Indeed, using different methodological approaches, several recent studies that have examined the learning of Spanish as a foreign language have documented the use of the L1 in teacher-led discussions (Zyzik & Polio, 2008), during consciousness-raising form-focused activities (Scott & De la Fuente, 2008), and in group interactions (Lacorte & Canabal, 2005). Therefore, unlike L2-based CSs, those based on the L1 may take a form that overlaps with usages of the L1 that respond to factors that go beyond learners' L2 resource limitations, and that may encompass a socio-linguistic dimension of language use.

With regards to the use of negotiation routines, the possible implications of the results of this study are tentative. First, the amount of negotiation work was rather low, a trend also found in Fernández-García and Martínez-Arbelaiz (2003). Second, as previously stated, there was a high degree of variability in performance. Third, within each condition, some dyads did not use any negotiation

work at all. Still, the significant difference between users and non-users of negotiations across task types provides evidence that the information-exchange requirement of the jigsaw made a difference in terms of how often learners engaged in solving comprehension problems. Furthermore, the fact that this difference was only found for the negotiations used to deal with the targeted vocabulary, indicate that closed tasks, like the jigsaw used in this study, that incorporate task-essential linguistic items, do indeed focus learner's attention to such items. In contrast, the relatively higher use of negotiations to refer to non-target vocabulary in the decision-making tasks corroborates the lack of control that the task designer can exert on learners' output when resorting to tasks of this nature.

Unlike with L2-based CSs, and to some extent in line with the results for L1-based CSs, the use of negotiations fell beyond the scope of the target vocabulary. Negotiations also addressed comprehension problems triggered by task management moves or that emerged as a byproduct of resorting to a CS to refer to an unknown non-target lexical item. The more consistent pattern found for use of L2-based CSs across target and non-target vocabulary suggests that they are more amenable to being elicited through the task designer's manipulation efforts than L1-based CSs and negotiations.

Conclusions, limitations and future research

In this study two task variables were isolated, type of task (open versus closed) and level appropriateness of the vocabulary, in order to examine their effects on the amount of output, on the use of CSs, and on the amount of negotiation of meaning generated by learners of Spanish as a foreign language. We argued that the presence of an information exchange requirement and a single resolution of outcome in the jigsaw (closed task) contributed significantly to the three discourse aspects that were measured, though more consistently to L2-based strategy use. Furthermore, the task-essentialness (Loschky & Bley-Vroman, 1993) of the target vocabulary of the jigsaw led learners to produce more language and to use it in specific ways in order to share information that was crucial to completing the task.

The study also shows that vocabulary difficulty/appropriateness, at least as operationalized in this study, contributes to promoting certain processes that are said to facilitate language acquisition, but not others. That is, it was possible to activate the use of CSs (L2-based), though neither more output nor more negotiations of meaning,

with tasks that included challenging target vocabulary. From this perspective, the current study offers evidence that it is possible to manipulate the design of tasks to elicit particular types of language use that support language development.

The electronic medium used in this study provided a suitable context for learners to simultaneously carry out independent discussions. Language teachers may want to include this type of practice to maximize classroom time allocated to language production. In addition, by using closed tasks similar in design to the jigsaw, teachers will ensure that learners engage in more extended interactions that include meaningful practice of targeted language items.

Although attempts were made to control for as many design variables as possible, there are certain limitations that may have partially influenced the results of the study and that should be taken into account in future research. Specifically, the vocabulary variable could have been operationalized in a more precise way, for example, using a pretest to account for individual learners' receptive and productive knowledge of the target lexical items.

While this study assumed that task-based learning could activate processes beneficial to language acquisition, it was not within its scope to investigate whether they actually resulted in specific learning gains. Future research should focus on devising research designs that allow examining what the learning effects of activating such processes are on language development. For instance, future research could examine whether the use of CSs entails a consciousness-raising or 'noticing effect' (Schmidt, 1990, 2001; Swain & Lapkin, 1995) that leads to the acquisition of target lexical items. In other words, research is needed that explores the connection between the development of strategic competence (Canale & Swain, 1980) and the development of the learner's lexical repertoire.

Future research should also explore whether the results obtained in this study would hold for learners at more advanced stages of acquisition. In particular, studies could address whether learners' performance with open tasks is more effective as proficiency is gained. Thus, replications of this study with more advanced learners may help to determine what the specific effects of task design features on second language development are in relation to level of proficiency.

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