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Field Dependence as a Factor in Second Language Communicative Production

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This study investigates the hypothesis that a more field-dependent cognitive style may be adaptive for certain components of second language proficiency. Native English speakers (n = 28) or students of English as a second language (ESL; n = 29) completed measures of language proficiency (formal and communicative) and field dependence–independence (FDI). Native English speakers performed better than ESL students on language measures, but not on FDI measures. As predicted, measures of FDI correlated negatively with measures of communicative production in the ESL group: A more *field-dependent* style was associated with better performance on second language communicative measures. FDI scores were not related to native English speakers' language. Results support a bipolar cognitive-style conception of FDI. Theoretical models of the FDI construct are discussed.

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Much research in second-language acquisition has focused on cognitive and personality factors that may relate to good language learning (e.g., Naiman, Frohlich, Stern, & Todesco, 1978; Skehan, 1989). One characteristic that was proposed early (Naiman et al., 1978) and continues to be a focus of interest (e.g., Chapelle & Green, 1992) is the cognitive style field dependence–independence (FDI). FDI is a mode of processing that applies particularly in situations that involve ambiguity or cognitive conflict (Pascual-Leone, 1969, 1989; Witkin, Dyk, Faterson, Goodenough, & Karp, 1962; Witkin & Goodenough, 1981). In such situations, field-independent (FI) persons tend to function in relative autonomy from external referents or sources of information (whether such referents be the external perceptual field or other individuals with whom the person is interacting; Witkin & Goodenough, 1981). By contrast, field-dependent (FD) persons tend to rely on external sources of information. The purpose of this study is to investigate the hypothesis that FDI is related to communicative second language (L2) proficiency, in particular, that a more field-dependent style may be adaptive for certain components of L2 proficiency.

An appealing aspect of the FDI dimension is that it is proposed to be bipolar and value neutral: Each pole of the dimension "has qualities that are adaptive in particular circumstances" (Witkin & Goodenough, 1981, p. 59). Greater autonomy (the field-independent end of the dimension) is associated with cognitive restructuring ability in perceptual and cognitive tasks. Greater reliance on external referents (the field-dependent end of the dimension) is proposed to foster a range of interpersonal competencies (Witkin & Goodenough, 1977, 1981; Witkin, Moore, Goodenough, & Cox, 1977).

FDI: Style or Ability?

The FDI construct is not without its critics, and for this reason we begin with a discussion of the construct. Some have argued that measures of FDI do not index cognitive style, but

rather cognitive or spatial ability (e.g., Bialystok & Hakuta, 1994; Chapelle & Green, 1992; Griffiths & Sheen, 1992; McKenna, 1983, 1984; Rose, 1988; Tiedemann, 1989). Abilities are competencies, associated with high task performance. Styles, in contrast, are propensities or modes of processing (Messick, 1994). This criticism has focused mainly on the most commonly used measures of FDI—versions of the Embedded Figures Test (EFT). In the EFT, the participant is presented with a series of complex drawings within which are embedded simple shapes. The task is to locate specified simple shapes within the complex drawings. Score is either the length of time taken to find the simple shapes (Embedded Figures Test) or the number of shapes found within a specified time limit (Group Embedded Figures Test).

Critics have argued that because field independence is associated with maximal performance on the EFT, the test at best confounds ability with style, and at worst indexes only ability. Furthermore, the EFT has yielded consistently high correlations with performance measures of intelligence, in particular, with the block designs subtest of the Wechsler scales (e.g., McKenna, 1984). Note that the EFT does not correlate with verbal measures of intelligence. These data have led some reviewers to dismiss FDI as nothing other than cognitive ability. Messick (1994), however, has cautioned against confounding the EFT measure with the FDI construct, because the construct refers to "a convergence of . . . indicators" (p. 126), not simply to score on a single test. On the basis of a review of research related to education and FDI, Davis (1991) concluded that FDI has both ability and stylistic aspects: "Field dependence sometimes acts as an ability and sometimes as a style, which is one of its intriguing features" (p. 165).

Messick (1994) and Wapner and Demick (1991) have pointed out the need for a process model of FDI and its associated measures. Messick has proposed that Pascual-Leone's (1989) model can play a useful function here. We examine this model briefly, as a framework for our research on FDI and second-language communicative proficiency.

Pascual-Leone (1989) proposed that tasks used to measure FDI all present a similar cognitive conflict for the respondent. In all FDI measures, the task situation serves to activate sets of schemes (i.e., mental structures) that are *misleading* with respect to correct task performance. These misleading schemes are highly activated, owing to past learning and to salient perceptual features in the situation. For example, in the EFT each item presents a complex drawing, and the participant must mentally break down the organization of this drawing to find the embedded simple target figure. Perceptual "field" factors (e.g., Gestaltist principles of perception) bias one toward perceiving the drawing as a whole (as an overall, holistic pattern), at the expense of seeing the embedded parts; past perceptual learning biases one in this direction as well. To succeed, the participant must mentally interrupt (i.e., lower the activation of) these irrelevant schemes and apply mental attention to boost the activation of task-relevant schemes—for example, those corresponding to features of the simple figure embedded within the complex drawing.

According to Pascual-Leone's model, FI persons have a richer repertoire of learned executive structures, used for controlling the application of mental interruption (i.e., central attentional inhibition) and mental capacity (central attentional activation). In contrast, FD persons have a weaker repertoire of these executive control structures—and, thus, often do not exploit the full power of their mental capacity and interruption functions. *Executives* are structures engaged in mental planning and the temporal structuring of mental processing and action across all sorts of tasks (Johnson, 1991a). One can define two sorts of executive structure (Pascual-Leone, Goodman, Ammon, & Subelman, 1978). Task executives (or plans) are addressed to the external situation and monitor the person's interaction with the environment (i.e., his or her performance). Control executives are addressed to the monitoring of organismic internal resources, for example, the allocation of cognitive capacities such as mental attention. Pascual-Leone (1989) proposed that, relative to FDs, FIs have a richer repertoire of control executives. Relative to FIs, however, FDs have

a stronger field factor (i.e., they are more "field-sensitive"), as well as a richer repertoire of automatized, context-bound knowledge structures. Because of these differential processing biases, FI persons tend to perform better than FD persons in task situations that are *misleading*, that is, situations in which features of the context serve to highly activate mental schemes whose application lowers the odds of producing a correct task performance.

Pascual-Leone has defined mental (or *M*) capacity as the maximal number of mental schemes—not directly activated by the input—that a person can actively keep in mind (i.e., within mental attention) at any one time (Pascual-Leone, 1970). Such a capacity is related to notions such as mental effort, working memory, and fluid intelligence. Pascual-Leone claimed that FIs do not have greater *M*-capacity than FDs, and Globerson (1989) presents empirical evidence in support of this claim. Rather FIs have better executives for allocating and controlling their *M*- and interruption capacities, and tend to perform better in situations in which a strategy involving executive-guided *M* and *I* (interruption) processes must apply to overcome a strategy activated by misleading contextual factors (i.e., content learning or field effects). One could find, however, that FDs perform better than FIs in situations that are *facilitating*, that is, where schemes that are highly activated by contextual features are conducive to correct performance. Other examinations of FDI in terms of processing strategies or biases are consistent with Pascual-Leone's model (e.g., Clark & Roof, 1988; Davis & Cochran, 1990).

The high correlation between EFT and block designs led Witkin and others (e.g., Case & Globerson, 1974; Globerson, 1983; Witkin, 1974; Witkin et al., 1962) to conclude that block designs is a good measure of FDI. It has led critics to conclude that EFT is a measure of intelligence (e.g., Cronbach, 1984; McKenna, 1984). Using Pascual-Leone's model, one can see that EFT and block designs both have the functional structure of a cognitive conflict situation. In both tasks, the participant is presented with a picture that has a strong overall organization or gestalt. Successful performance requires the person to mentally overcome this

organization and restructure it into nonsalient component forms. In the EFT, the person must break the pattern to search for features of an embedded target shape. In block designs, the person must mentally decompose a two-dimensional model picture into component forms on three-dimensional blocks. Field- and perceptual-learning factors boost perception of the overall picture; to succeed, the person must be able to mentally interrupt this perception and mentally boost schemes corresponding to the simple shapes or component forms. According to Pascual-Leone's model, FIs do better on both tasks for three main reasons: They have a weaker field factor, better executives for controlling interruption of irrelevant schemes, and better executives for the mental boosting of relevant schemes. In contrast, FDs have difficulty with both tasks, because they have a stronger field factor and weaker executives for controlling mental interruption and attentional activation.

There are considerable data supporting superior performance by FI participants on tasks involving cognitive conflict (e.g., Davis, 1991; Pascual-Leone, 1989; Pascual-Leone & Morra, 1991; Tinajero & Páramo, 1998; Witkin & Goodenough, 1981). According to Pascual-Leone's model, however, one should be able to lessen the influence of FDI on performance by decreasing misleadingness. Furthermore, one should be able to construct situations that take advantage of the strengths of the FD style. This would argue against the ability interpretation of FDI. Pascual-Leone (1969) found that FIs performed better than FDs on a standard mirror-tracing task (i.e., tracing a star-shaped path, when the only visual feedback is a mirror image of the hand and path). However, when the task was adapted to be field facilitating (by changing the path from a solid line to a series of dots to be connected), FDs were found to perform as well as or better than FIs. Baillargeon, Pascual-Leone, and Roncadin (1998) found that on the figural-intersections test of mental capacity, FI children were more likely than FD children to pass items within their predicted mental capacity, but FDs were more likely to pass items beyond their predicted capacity. The authors inferred that on difficult items

(i.e., items on which an analytical strategy would be beyond the child's capacity), FD children used perceptual strategies that had some chance of success. In a series of studies, Ohlmann and Marendaz (1991) classified participants as FD or FI on the basis of their performance on the Rod-and-Frame task. The researchers then examined the effect of posture on participants' performance on other measures. They found that adopting the sharpened Rhomberg position (i.e., standing with one foot in front of the other, on a narrow support) resulted in FDs performing as well as FIs on the EFT and other measures of FDI. Because one would not expect posture to affect the expression of an ability, these results argue for a more dynamic interpretation of FDI, that is, as an expression of relative balance among a number of factors that affect task performance.

Other studies have shown that provision of contextual support can eliminate performance differences between FDs and FIs, or even produce a performance advantage for FDs. Lu and Suen (1995) found that FD university students obtained lower grades than FI students on "performance-based" course assessments (i.e., take-home projects), but scored as well as FI students on multiple-choice tests covering the same content. Rickards, Fajen, Sullivan, and Gillespie (1997) had university students read two structurally similar passages in either a notetaking or no-notetaking condition. FI students increased their recall of high-level information on the second passage in the no-notetaking condition. In contrast, FD students had positive transfer to the second passage in the notetaking condition, with their recall of high-level information surpassing that of the FI students. Rickards et al. argued that their results support a stylistic interpretation of FDI. Zambito (1998) had ESL (English as a second language) students listen to an audiotaped lecture while taking notes either on a structured outline or on a blank sheet of paper (unstructured condition). On a subsequent recall test, FIs scored higher than FDs in the unstructured condition, but FDs scored higher than FIs in the structured condition. Consistent with Rickards et al., Zambito's results suggest that FIs perform best in unstructured situations,

but that FDs may take better advantage of structural cues when they are present.

Additional evidence for the adaptive character of a field-dependent style can be found in the social domain. Relative to FIs, FDs tend to be more social and more alert to social cues. "[R]elatively field dependent people are likely to gravitate toward situations [and occupations] that will involve them with others [, whereas] relatively field independent people tend to favor situations of a more solitary kind" (Witkin & Goodenough, 1977, p. 675). According to Witkin and Goodenough (1981), the interpersonal orientation of FD people is constituted by a "repertoire of behaviors that will give them access to external referents when needed" (p. 50). In 1977, Witkin and Goodenough reviewed a large body of data indicating that FD persons have an interpersonal orientation, whereas the orientation of FIs is relatively impersonal. Witkin and Goodenough (1977, 1981) associated interpersonal orientation with greater social skill.

More recent research has drawn a distinction between interpersonal orientation and social skill. This research offers mixed support for the bipolar or value-neutral nature of the FDI construct. Rollock (1992) found that FD introductory psychology students outperformed their FI classmates on knowledge of material that had been presented in an interactive way, "using examples that required social sensitivity for full appreciation" (p. 807). Van Meel (1991) had young adults write autobiographies and complete the EFT. Autobiographies were scored on a number of scales, and FIs were found to score significantly lower than FDs on the 'social relationships' scale. "The field-independent persons mentioned more problems in their relationships with others from the early school years onward and describe[d] their own personality as more aloof and self-sufficient" (p. 346). Dreyer (1991) reported data on individual differences in ability to send and receive nonverbal information on people's emotional states. He found that FDs were more accurate senders of nonverbal cues, but that there was no relationship between FDI and accuracy in receiving nonverbal cues to emotional states. Finally, results of a

15-year longitudinal study conducted by Kogan and Block (1991) suggest that FD children and adolescents may have an interpersonal orientation, but "there is no indication in the data that such an orientation translates into actual interpersonal skill" (p. 193). Interpersonal measures were based on Q-sorts by teachers and other observers.

In sum, although much of the literature on FDI reports that FIs tend to outperform FDs on cognitive tasks, deeper analysis in terms of a process model suggests that this performance differential is relative to the processing demands of the situation. The processing demands of tasks can be adjusted to eliminate performance differentials, or to create a performance advantage for more FD persons. Further, research tends to support the claim that FDs have a stronger interpersonal orientation and greater alertness to social cues than FIs, although this does not necessarily imply that FDs have greater social skill.

FDI and Linguistic Performance

Although FDI measures generally do not correlate with measures of verbal IQ, a number of studies have found relationships between FDI and performance on first-language tasks. Two recent reviews of FDI and its relationship to academic achievement (Davis, 1991; Tinajero & Páramo, 1998) reported that FIs tend to obtain higher school grades and to score higher on standardized tests of their first language, although Tinajero and Páramo cautioned that "this superiority appears to depend on the specific skill considered and on the disembedding and/or restructuring ability which that skill demands" (p. 232). Both reviews reported that FIs tend to perform better than FDs on reading tasks in their first language. The association with FDI is more likely to be found when the participants are in the process of acquiring the reading skill in question; as the skill becomes more automatized, the relationship with FDI lessens.

Goodman (1971) and Lefever and Ehri (1976) examined processing of ambiguous sentences in the first language. Both

studies reported that FIs generated more interpretations for ambiguous sentences than did FDs; Goodman (1971), however, found no cognitive style differences in ability to *recognize* interpretations for ambiguous sentences. In generating multiple interpretations for an ambiguous sentence, initial interpretations create a misleading semantic field vis-à-vis later interpretations: One must mentally interrupt (i.e., decrease the activation of) earlier interpretations and apply mental effort to generate new and different interpretations. This is not so when the task is made facilitating by listing possible interpretations to be accepted or rejected. DeFazio (1973) found no cognitive style effects for performance on a vocabulary test, but found that FIs performed better than FDs on a verbal fluency test, in which participants had to write as many words as possible that began with one letter and ended with another. The verbal fluency test is similar to the ambiguous sentences task, in that early responses become misleading vis-à-vis later responses. DeFazio (1973) also found that FIs performed better on a cloze task (i.e., filling in words deleted from a paragraph), a finding often replicated in the second language literature (e.g., Chapelle & Green, 1992). Nagata (1997) had native speakers of Japanese judge the grammaticality of Japanese target sentences that violated the subjacency condition. Target sentences were paired with grammatical or ungrammatical anchor sentences that were similar in surface structure to the targets. He found that FDs tended to assimilate judgement of the target sentences to their judgement of the anchors; FIs, in contrast, judged the targets relatively independently from the anchors.

There has been considerable research relating second language performance to FDI style. Recent reviews include Chapelle and Green (1992), Bialystok and Hakuta (1994), and Tinajero and Páramo (1998). The preponderance of evidence has shown a more field-independent style (invariably, as indexed by the Group Embedded Figures Text [GEFT]) to be associated with superior performance on measures of second language acquisition. Chapelle and Green presented a summary table with 32 correlations, from 10 studies relating Embedded Figures performance to measures

of second-language proficiency. Twenty-six of the correlations were significantly different from zero, and all significant correlations were positive—indicating that a more field-independent style is associated with better L2 performance. The significant correlation coefficients ranged from .20 to .75, with the median correlation being .34. Thus, the relationship tends to be positive and of low to moderate magnitude.

This positive association between GEFT and L2 performance has been found for students learning English as a second language, either in their home country (Alptekin & Atakan, 1990; Hansen, 1984) or in the United States (Chapelle & Roberts, 1986; Hansen-Strain, 1987; Jamieson, 1992), and for English-speaking students learning a second language at school or university (Abraham, 1983; Carter, 1988; Elliot, 1995a, 1995b; Genesee & Hamayan, 1980; Hansen & Stansfield, 1981, 1982; Naiman et al., 1978; Stansfield & Hansen, 1983; Tucker, Hamayan, & Genesee, 1976). Two studies have examined strategy use and FDI. Abraham (1983) found that, for a group of adult ESL learners, score on the GEFT was positively correlated with monitoring for correctness in written use of the third-person-singular "s" morpheme. Jamieson and Chapelle (1987) studied the learning strategies of ESL students working on computerized lessons in spelling and dictation. Consistent with Abraham (1983), they found that GEFT score was positively correlated with monitoring output (i.e., editing responses). They also found that GEFT was negatively correlated with time to make an initial response (assumed to index advance preparation); that is, a more FI style was associated with quick initial responding.

Some researchers in second language learning have made predictions consistent with the bipolar conception of the FDI dimension (Carter, 1988; Chapelle & Roberts, 1986; Hansen & Stansfield, 1981; Johnson & Rosano, 1993; Skehan, 1989). They reason that the superior restructuring ability associated with the FI pole should facilitate linguistic analysis and thus acquisition of formal competence in the second language. In contrast, the interpersonal orientation of learners at the FD pole could facilitate

acquisition of communicative or functional competence in the second language. In other words, FIs should perform better on measures of academic language proficiency, and FDs should perform better on measures of oral communicative competence.

By and large, the data do not support predictions derived from the bipolar conception of FDI. The relationship between GEFT and L2 performance does tend to be stronger for measures of academic language proficiency (e.g., written, cloze, or multiple-choice tests) than for measures of oral production (Bialystok & Hakuta, 1994; Johnson & Rosano, 1993). However, researchers generally have not found advantages of FD style. Rather, they have found measures of oral communicative competence either to be unrelated to cognitive style (Genesee & Hamayan, 1980; Hansen-Strain, 1987; Tucker et al., 1976) or to be positively related to field independence (Carter, 1988; Chapelle & Roberts, 1986; Hansen & Stansfield, 1981, 1982).

There are two studies that are consistent with the bipolar conception of FDI in the context of second language learning. Abraham (1985) reported an interaction between cognitive style and type of second language instruction. In a study of foreign students in an intensive university English program, Abraham found that rule-based instruction was more conducive to learning in FI students, whereas example-based instruction was more conducive to learning in FD students. Johnson and Rosano (1993) found negative correlations between a measure of FDI and measures of second-language communicative proficiency in university students studying ESL. For these students, a more field-dependent style was associated with better scores on communicative measures. Johnson and Rosano used the block designs subtest from the Wechsler Adult Intelligence Scale—Revised (WAIS-R; Wechsler, 1981) as their measure of FDI. For ESL students, block designs correlated positively with a verbal analogies measure, but negatively with two indices of L2 communicative proficiency: the ESL teachers' rating of their students' pragmatic competence in L2 communication, and the number of interpretations students volunteered for a series of metaphoric sentences, during an oral

interview. In contrast, the number of metaphor interpretations correlated positively with block designs in a comparison group of native English speakers.

Johnson and Rosano's (1993) results are consistent with the bipolar conception of FDI. They call into question claims that FDI is not a useful construct in second-language research (Griffiths & Sheen, 1992; Skehan, 1989), as well as claims that correlations between FDI measures and L2 performance are due to differences in cognitive ability (e.g., Bialystok & Hakuta, 1994; Chapelle & Green, 1992). To claim the latter, one must explain why high scores on measures of L2 communicative production should be associated with low ability.

Johnson and Rosano speculated that the negative correlations with the FDI measure might have been because, unlike in previous studies, their oral language measures did not confound communicative proficiency with formal aspects of language use. The teacher rating form they used did include rating of aspects such as syntax, vocabulary, and pronunciation, but it was heavily weighted toward rating the student's ease of communicating in different pragmatic contexts. The metaphor measure simply indexed the number of semantically distinct interpretations offered, independent of the skill with which the interpretations were expressed. In contrast, the oral production measures used in previous research typically have involved an interview subsequently rated by the researchers (Carter, 1988; Genesee & Hamayan, 1980; Hansen-Strain, 1987; Tucker et al., 1976). Other measures have been teacher rating of oral proficiency or grade assigned for the oral segment of a course (Hansen & Stansfield, 1981, 1982). Chapelle and Roberts (1986) reported using an oral test of communicative competence, but did not discuss how the test was scored. It is likely that scores on these oral production indices reflect myriad aspects of oral proficiency, including more formal aspects such as grammar.

The Present Study

Language proficiency is a complex construct constituted by a multiplicity of subskills (Cummins, 1991; Snow, 1991). Johnson and Rosano argued that their *metaphor fluency score* indexed willingness to continue communicating in the L2. A more natural situation for assessing willingness to communicate would seem to be a conversational context. Contexts designed to elicit conversation are commonly used to assess speaking proficiency in the L2 (e.g., Young, 1995). How the elicited conversation is scored determines the aspect of proficiency that is measured. The present study examined the relationship between measures of FDI and mainly one aspect of communicative proficiency: the amount of information conveyed by the L2 speaker in a face-to-face (i.e., contextualized—Cummins, 1991; Snow, 1987) language situation. We call this aspect *communicative production*, and we elicited communication from the L2 speakers in both a conversational context and a metaphor interpretation interview.

To index FDI, Johnson and Rosano used the block designs task, a task that can be argued to measure FDI, but that has not been used previously in the L2 literature. To increase construct validity, we used two measures of FDI—block designs, plus the more commonly used GEFT (Oltman, Raskin, & Witkin, 1971). If both are proper measures of FDI, then they should correlate with each other and should correlate in the same way with the L2 communicative production measures. We studied a group of ESL students and a comparison group of native English speakers. The comparison group served two main purposes. It allowed us to characterize, by means of comparison with a group of native English speakers, the English proficiency levels of the ESL group. It also allowed us to test our claim that the predicted negative relationship between indices of communicative production and performance on FDI measures is unique to the L2 context. Note that our main predictions are expressed in terms of correlations. This is because (despite the tendency in the literature to contrast FDs with FIs) we believe that the FDI dimension is a continuous

one, and its relationship to language is better examined through investigation of relationships rather than differences.

For the ESL group, we predicted positive correlations among the three communicative language measures (i.e., teacher rating, metaphor fluency, and conversation scored for communicative production); and we predicted that each of these language measures would correlate negatively with the two measures of FDI (i.e., block designs and GEFT). The latter pattern would be consistent with the claim that a more FD style is adaptive for certain aspects of L2 proficiency. Given that communicating in their native language should pose no challenge for the native English-speaking participants, we did not expect to find correlations between language scores and cognitive style in this group. This expectation is consistent with Davis' (1991) observation that once a skill is fully automatized, one should not expect to find significant performance differences between FIs and FDs.

Method

Participants

Participants were students from a university in Toronto. A sample of 28 (13 male, 15 female) native English speakers was recruited from first-year social science courses. A sample of 29 (14 male, 15 female) ESL students was recruited from sections of a first-year introductory ESL course; participants were in the second term of this course. The university ESL course is intended for first-year students who meet university admission requirements, but whose first language is not English and whose scores on an English evaluation test indicate that they require special instruction in English to cope with required assignments. Mean age was 20.00 years (SD = 2.42) for the English-speaking group and 21.14 (SD = 2.78) for the ESL group. There was no group difference in age, $F(2, 55) = 2.72$, $p > .05$.

English was the first language of all participants in the English-speaking group, and all but five had been born in Canada. Not all English-speaking participants were monolingual, however: 57% reported knowing at least one other language (these included French, Italian, Cantonese, Greek, and Hungarian). This reflects the multicultural nature of the student population in Toronto, and offers the advantage of a comparison between groups who differ in level of proficiency in English, but not necessarily in experience of other languages.

Of the ESL group, 72% had been born in Hong Kong, and 79% identified their first language as Cantonese. The remaining participants had been born in Malaysia, Taiwan, Macao, Iran, Israel, or Latvia, and spoke as their first language Mandarin, Persian, Hebrew, or Arabic. All ESL participants spoke at least one second language—English—and 52% spoke a third or fourth language. Sixty-nine percent of the ESL participants had resided in Canada 2.5 years or less; the others had been in Canada for 3 to 5 years.

Cognitive Style Measures

Group Embedded Figures Test. The GEFT (Oltman et al., 1971) is a paper-and-pencil task in which the respondent must find and trace simple forms embedded within complex drawings. There are nine items in each of two sections, and each section has a time limit of 5 minutes. The score is the number of items correctly traced; a high score is associated with a more field- independent style. We assessed the internal consistency of the GEFT by correlating the first half of the test with the second half. We then used the Spearman–Brown Formula to obtain an estimate of reliability for the full-length test. The resulting reliability coefficient was .83 for each of the samples in the current study.

Block designs. Block designs is a subscale of the WAIS-R (Wechsler, 1981). It is a timed task in which the respondent uses colored blocks to reproduce pictured models. We report data for the raw score: A higher score indicates a more analytical or field-independent style.

Communicative Language Measures

For purposes of cross-validation, we used three oral communication measures: ratings by the ESL teachers, amount of information conveyed in a conversational context, and number of metaphor interpretations generated. To the extent that each of these indexes communicative production, one would expect them to correlate positively with each other and negatively with the FDI measures in the ESL sample. We did not expect correlations in the native English-speaking sample.

Teacher rating. The Observation Form from the Language Assessment Scales (De Avila & Duncan, 1983) was used as an index of "pragmatic competence" in English for the ESL students; it was completed by the ESL teachers in March (the ESL course had begun in September). The form was changed somewhat to make it appropriate for use at the university level. The form consists of 10 items; on each item, oral proficiency is rated on a 7-point scale (–3 to +3). Five items describe pragmatic contexts (e.g., explaining to a monolingual friend how to play a sport) and ask the teacher to rate how much difficulty the student would have communicating in English in each context. The remaining 5 items request ratings of the student's skill level in English pronunciation, comprehension, vocabulary, syntax, and general communicative competence. The rating scale would seem to tap communicative production, as well as other oral language skills (i.e., difficulty in communicating content, skill level in various aspects of oral production). Ratings were converted to a 1 to 7 scale (where 7 reflects high competence), and overall score was the mean of ratings on the 10 items. The mean overall score for the ESL group was 5.02 (SD = 1.16). Cronbach's alpha for the present sample (n = 29) was .98, indicating a high degree of homogeneity across items in the rating measure.

Conversational measure. The interviewer engaged each participant in a two-minute "conversation" on each of two topics: the interviewee's hometown and a favorite sport, game, or hobby. The situation was introduced as a general conversation task in which

the interviewer could get a feel for how the participant talked. Participants were asked to speak in a natural manner and were requested to describe their hometown and how to play their favorite sport. The interviewer used set probes only when needed to keep the respondent talking. The number of interviewer probes was recorded for each participant. Thus, the interviewer played the role of an attentive and interested listener, in a situation that constituted more a monologue than a dialogue.

We used the "minimal terminal unit" or "T-unit" to score the participants' speech (Hunt, 1965, 1970). The T-unit is defined as one main clause plus any subordinate clauses attached to it. We maintained Ramirez' (1974) distinction between "implicit" and "explicit" T-units. Explicit T-units are structurally complete (e.g., "There are a lot of restaurants just beside the highway"), whereas implicit T-units are structurally incomplete (e.g., "Well, yah, when I was a kid"). Explicit T-units far outnumbered implicit ones in both samples. Implicit T-units were often answers to interviewer questions, and the number of implicit T-units correlated significantly with the number of interviewer probes; this was not the case for explicit T-units. The two participant samples did not differ significantly in the number of implicit T-units, and implicit T-units were uncorrelated with other measures on the participants. For these reasons, we report data only for explicit T-units.

Transcripts were made of the first two minutes of conversation on each topic. False starts and mazes were eliminated before T-unit scoring. There were two scorers, each scoring half the transcripts from each sample. Inter-rater reliability was computed for a random sample of 14 transcripts (7 from each subsample) scored by both scorers; the correlation between scorers for the number of explicit T-units was $r = .95$. To obtain an estimate of the internal consistency of the T-unit score, we correlated the score for the first topic with that for the second and used the Spearman–Brown Formula to correct for attentuated length. The resulting reliability coefficient for the T-unit score was .73 for the ESL sample and .68 for the native English-speaking sample.

The main measure derived from the T-unit scoring was the *total number of explicit T-units* (summed across the two topics). This score reflects the amount of information offered by the participant during the course of the conversation. Other researchers have used number of T-units to index the amount of information recalled from stories by both first- (Fagan & Currie, 1983) and second-language speakers (Duncan & De Avila, 1982). Fagan and Currie (1983) found the number of T-units to be highly correlated with the number of clauses in transcripts of respondents' oral recall of a story. Young (1995) used T-units to score structured interviews with adult ESL students. He used the number of T-units per minute of speech as a measure of the quantity of talk from each interviewee, and found that participants rated as highly proficient in English produced significantly more T-units than those rated as having intermediate proficiency. Since the conversations in the current study were of constant length, the number of T-units can be taken as a measure of the quantity of talk. For the ESL group, we expected the number of T-units to correlate positively with scores on other language measures and to correlate negatively with measures of cognitive style.

Because a T-unit is constituted by a main clause plus any subordinate clauses attached to it, and T-units can therefore vary in their syntactic complexity, we also scored explicit T-units as *simple* versus *complex*. Simple T-units contained no subordination or coordination of clauses (e.g., "I come from Hong Kong"), whereas complex T-units did (e.g., "I come from Hong Kong and was also born in Hong Kong"). For a random sample of 12 transcripts (6 from each sample), interrater reliability was $r = .95$ for simple T-units and $r = .89$ for complex T-units. It was expected that the majority of T-units produced by ESL speakers would be simple, and that this score would correlate positively with scores on other language measures and correlate negatively with measures of cognitive style in the ESL sample. The number of complex T-units should also correlate positively with other language measures. We did not predict a correlation between cognitive style and number of complex T-units, however, because we believe that field dependence

is related to the amount of information conveyed in a conversation, not necessarily to the complexity with which it is conveyed.

Finally, for the ESL sample only, explicit T-units were scored for syntactic and semantic errors, and the number of *error-free T-units* was tallied. Inter-rater reliability was r = .96. Larsen-Freeman (1983) found a correlation of .48 between the number of error-free T-units in oral picture descriptions and ESL students' score on a language placement examination. To the extent that number of error-free T-units is an index of oral proficiency, we would expect this score to correlate positively with other language measures. A negative correlation with the cognitive style measures would indicate that the greater communicativity associated with field dependence does not come at the cost of more errorful speech.

Metaphor fluency. Participants interpreted orally each of 10 ambiguous metaphors; the first 2 were practice items that were not scored. All metaphors had the form "___ was a ___" (e.g., "His smile was a door"); the metaphor items were the same as those used by Johnson and Rosano (1993). Participants first were asked to explain the meanings of the nouns used in the metaphors; all could do so. The tester then read each metaphor item aloud and asked for a possible meaning. Once the respondent had given one or more spontaneous meanings for an item, the tester requested an additional meaning. The metaphor interviews were tape recorded and later transcribed. The number of different responses the participant gave for each item was tallied, and this number was averaged across items to yield a metaphor fluency score. This fluency score appeared to index communicative production in ESL students in the Johnson and Rosano study. We used split-half reliability to estimate the internal consistency of the metaphor fluency measure. We assigned items randomly to part A versus part B and computed the correlation between the mean scores on the two parts. The resulting reliability coefficient (after correction with the Spearman–Brown Formula) was .72 for the ESL sample and .71 for the native English-speaking sample.

Academic Language Measures

These measures were included for the purpose of discriminant validity with reference to the cognitive style scores. They were decontextualized measures of knowledge of English, but not measures of analytical grammar ability. We expected that the academic measures would share some variance with the communicative language measures and, thus, correlate positively with them. We did not expect, however, that the academic measures would share the critical communicative variance that should produce a negative correlation with the FDI measures; that is, we did not predict a significant negative association between the academic measures and the cognitive style scores.

Participants completed the Picture Vocabulary and Verbal Analogies subtests from the oral language proficiency subscale of the Woodcock Language Proficiency Battery, English form (Woodcock, 1980). The Picture Vocabulary task requires the respondent to give the appropriate verbal labels for pictured objects or events. In the Analogies task the respondent must complete oral statements of verbal analogies. Vocabulary score is more likely to reflect language-specific structure than is Analogies score, because performance on the Analogies task is likely to depend somewhat on problem-solving ability (Johnson, 1989). We converted raw scores on the Woodcock subtests to part scores, following the test manual; this put the two subtest scores on the same scale.

Self-Ratings

Finally, self-ratings were obtained from the ESL students on aspects of communicative proficiency and practice. These were used for cross-validation purposes with the communicative production measures, and to determine whether preference for functional language practice might be related to measures of FDI.

ESL participants used a 5-point scale to rate, separately, their ability to understand, speak, read, and write English. The scale ranged from *Not at all* (1) to *Extremely easily* (5). Because

the current study focused on oral proficiency, the ratings of most interest were those for speaking and understanding.

ESL participants also answered questions about techniques or methods they used for learning English outside of the requirements of their ESL class. These questions were adapted from Huang and Van Naerssen (1987) and were intended to distinguish formal versus functional strategies. For each question, participants responded by checking off one of the following: very often, often, sometimes, rarely, never (a high score indicates more frequent use). The question of most interest was "How often do you look for chances to converse with native English speakers?"

Procedure

Participants were tested individually in one session and were paid $10 for their participation. Two female testers each tested about half the participants in each group. The tasks were administered in the following order: conversation (hometown, followed by favorite sport), metaphor interpretation, block designs, picture vocabulary, verbal analogies, and GEFT. Demographic data and self-ratings of second-language proficiency and learning strategies were collected at the end of the session.

Results

Group Differences in Performance Levels

We begin by examining performance levels of the two samples on the various measures. We expected the ESL sample to score lower than the native English-speaking group on the language measures (with the exception of metaphor fluency; Johnson, 1991b; Johnson & Rosano, 1993), but expected no group differences on the FDI measures. Table 1 contains sample means by group for the cognitive style and language measures. Initial analyses contained gender as a factor; however, there were no significant

Table 1

Mean Scores on Cognitive Style and Language Measures as a Function of Group

	Group				
	English-speaking		ESL		
	M	*SD*	*M*	*SD*	η^2
Group embedded figures	11.71	3.72	12.21	5.02	.003
Block designs	37.32	8.13	35.62	7.46	.012
Vocabulary	178.93	5.30	159.79	4.03	.811
Analogies	177.82	4.60	170.17	3.73	.464
Metaphor fluency	2.13	0.41	2.19	0.41	.004
Conversation:					
No. interviewer probes	9.07	3.18	8.21	2.96	.020
Total T-units	49.20	10.88	32.95	10.28	.380
Simple T-units	31.14	7.27	26.28	8.24	.092
Complex T-units	17.57	5.69	6.78	3.89	.561
Error-free T-units			19.71	9.24	

Note. η^2 = Effect size for group difference.

effects involving gender for any of the variables. We report results of a series of analyses of variance, used to test for group differences in task measures; Table 1 contains the η^2 measure of effect size for these group comparisons.

As expected, the two groups did not differ in performance on the cognitive style tasks or on metaphor fluency: $F(1, 55) < 1$, for GEFT, block designs, and number of metaphor interpretations. There was no group difference in the number of probes made by the interviewers during the conversational segments, $F(1, 55) = 1.13$, $p > .05$, indicating no differential treatment of the two groups. As indicated in Table 1, effect size for each of these comparisons was small, with the group effect accounting for no more than 2% of the variance.

The Woodcock vocabulary and analogies scores were examined in a 2 (group) × 2 (test) analysis, with repeated measures on

the test factor. There were main effects for group, $F(1, 55) = 183.44$, $p < .001$, and test, $F(1, 55) = 52.24$, $p < .001$, together with a Group × Test interaction, $F(1, 55) = 80.17$, $p < .001$. On each test, the English-speaking sample performed higher than the ESL sample, but the group difference was much greater on the vocabulary than on the analogies test—consistent with the claim that vocabulary taps more language-specific variance.

Group differences in number of T-units were examined in a 2 (group) × 2 (type of T-unit, i.e., simple vs. complex) analysis of variance. There were significant effects for group, $F(1, 55) = 33.5$, $p < .001$; type of T-unit, $F(1, 55) = 243.5$, $p < .001$; and Group × Type, $F(1, 55) = 7.8$, $p < .01$. Both groups produced more simple ($M = 28.67$, $SD = 8.09$) than complex ($M = 12.08$, $SD = 7.27$) T-units. Overall, English-speaking participants produced more T-units ($M = 49.20$) than did ESL students ($M = 32.95$); however, this group difference (and the associated effect size) was greater for complex than for simple T-units. Note that for the ESL sample, 60% of their explicit T-units were error-free and 80% were simple.

Relationships Among Measures of the Same Construct

Cognitive style. The correlation between GEFT and block designs was .65 for the ESL sample and .78 for the English-speaking sample (ps < .001). This is somewhat lower than the correlation of .80 (between EFT and WAIS block designs) reported by Witkin et al. (1962) for a sample of 31 adult men, but still indicates a fairly high degree of association.

Language measures. Correlations for the ESL sample appear in Table 2. Because the predictions for the ESL group were directional, significance values are given for one-tailed tests. We focus here on correlations among the language measures. In a later section we examine relationships between language measures and cognitive style measures. The main measures of communicative production were the T-unit scores, the metaphor fluency score, and the teachers' rating of the ESL students' oral proficiency in English. Supplementary communicative proficiency measures

Table 2

Matrix of Sample Correlations for ESL Group

	1	2	3	4	5	6	7	8	9
1. Block designs	—								
2. GEFT	65***	—							
3. English vocabulary	–12	09	—						
4. English analogies	–20	–07	34*	—					
5. Teachers' rating	–32*	–32*	37*	14	—				
6. Metaphor fluency	20	22	29	28	34*	—			
Self-ratings:									
7. Understand English	–30	–04	38*	28	42**	10	—		
8. Speak in English	–16	13	51***	29	22	22	62***	—	
9. Converse in English	–30	04	30	29	28	23	57***	55***	—
Conversation measures:									
Total T-units	–49***	–50***	50***	27	47***	07	51***	55***	57***
Error-free T-units	–48***	–47***	69***	40**	40**	00	51***	46**	45**
Simple T-units	–56***	–60***	42**	24	37**	–02	46**	41**	45**
Complex T-units	–13	–06	46**	21	46**	19	39**	55***	53***

Note. n = 29. Decimal points have been eliminated from the correlation coefficients. All p values are for one-tailed tests. GEFT = Group Embedded Figures Test.
***$p < .005$, **$p < .025$, *$p < .05$.

were the ESL students' ratings of their own facility in understanding and speaking English and the frequency with which they sought conversation with native English speakers. Vocabulary and verbal analogies were included as decontextualized measures of knowledge of English.

We examine first correlations among the three main measures of communicative production. For the ESL sample, the T-unit scores correlated positively with the teachers' rating of proficiency in English (see Table 2). Twenty-two percent of the variance in the total T-unit score was shared with the teachers' rating, providing some evidence for the validity of these measures as communicative indices, but also indicating a good deal of unique variance. Metaphor fluency correlated only with the teachers' rating, and this correlation (r = .34) was lower than that obtained by Johnson and Rosano (r = .71). This calls into question the validity of the metaphor fluency score as an index of communicative production, in the present sample.

The participants' self-ratings correlated positively with the T-unit scores (see Table 2). About 30% of the variance in the total T-unit score, for example, was shared with the students' ratings of their ability to speak English and their frequency of seeking out English-speaking conversational partners. The teachers' rating of oral proficiency correlated only with self-rating of ability to understand English; and the metaphor fluency score did not correlate with the self-ratings. Correlations among the communicative measures best support the validity of number of T-units as indexing an aspect of communicative proficiency.

The two decontextualized measures—vocabulary and analogies—correlated with each other at a level (r = .34) not dissimilar to that found by Johnson and Rosano (r = .43). Vocabulary score yielded stronger associations with the other language measures than did analogies. As predicted, vocabulary correlated with the T-unit scores, indicating that word knowledge—assessed with a decontextualized measure—relates to communicative proficiency. Vocabulary correlated most strongly with the number of error-free T-units, and this was the only T-unit measure that correlated with

the verbal analogies score. These results suggest that more formal knowledge of the language may relate particularly to correct usage in conversation. Vocabulary score correlated with the teachers' rating of oral proficiency, but not with metaphor fluency.

Correlations for the native English-speaking sample appear in Table 3. Because there were no predictions regarding correlations in this sample, *p*-values are reported for two-tailed tests. As expected, there were few significant correlations for this sample. Vocabulary and analogies scores correlated positively, and vocabulary correlated negatively with the number of complex T-units.

Relationship Between Cognitive Style and Language Measures

For the ESL sample, we predicted negative correlations between the cognitive style measures (GEFT and block designs) and the measures of communicative production (total number of T-units, number of simple T-units, number of error-free T-units, teacher rating, and metaphor fluency); we did not expect a

Table 3

Matrix of Sample Correlations for Native English-Speaking Group

	1	2	3	4	5
1. Block designs	—				
2. GEFT	78***	—			
3. English vocabulary	25	26	—		
4. English analogies	24	33*	46**	—	
5. Metaphor fluency	–18	–26	05	–01	—
Conversation measures:					
Total T-units	–01	–10	–25	–04	–03
Simple T-units	01	00	–07	10	–02
Complex T-units	–06	–26	–39**	–16	–13

Note. n = 28. Decimal points have been eliminated from the correlation coefficients. All p values are for two-tailed tests. GEFT = Group Embedded Figures Test.
***$p < .01$, **$p < .05$, *$p < .10$.

relationship between cognitive style and number of complex T-units. As predicted, number of T-units correlated negatively with GEFT ($r = -.50$) and block designs ($r = -.49$). Greater communicative production (as indexed by number of T-units) was associated with a more field-dependent cognitive style (as indexed by relatively low scores on block designs and GEFT). A similar pattern was obtained for the number of error-free T-units and the number of simple T-units. By contrast, the complex T-unit score was unrelated to the cognitive style measures.

As predicted, the teachers' rating of English proficiency correlated negatively with the cognitive style measures. Contrary to prediction, metaphor fluency was not related to the cognitive style measures. Participants' self-ratings (of their own English proficiency and their reported frequency of seeking out conversation with native English speakers) were not related to the cognitive style measures.

The vocabulary and analogies scores were not related to the cognitive style measures. Johnson and Rosano (1993) obtained a significant positive correlation between block designs and verbal analogies. In contrast, in the present sample, the correlation between block designs and analogies was negative and not significantly different from zero. The correlation between GEFT and the two academic language measures was essentially zero in the present sample.

The number of T-units had a correlation of the same magnitude (i.e., .50) with vocabulary and with GEFT score, yet there was no correlation between GEFT and vocabulary. This suggests that there are at least two sources of variance in the T-unit score: knowledge of English vocabulary and communicativity. We predicted that the FDI measures would relate negatively to the latter source of variance, but *not* to the former. We used part (i.e., semipartial; Wherry, 1984) correlation to examine the relationship between number of T-units and GEFT score, after variance shared with vocabulary was removed from the T-unit score. The resulting part correlation was –.63: 40% ($.63^2$) of the residual variance in number of T-units could be accounted for by GEFT score. We used

multiple regression analysis to examine the combined influence of vocabulary and GEFT on total number of T-units in the ESL sample (see Table 4). Both predictors contributed significantly to the regression, and together vocabulary and GEFT accounted for 55% of the variance in total number of T-units (i.e., $R = .74$).

In the native English-speaking sample (see Table 3), the only correlation between language and cognitive style measures that approached significance was that between GEFT and analogies ($r = .33$, $p < .09$). Johnson and Rosano (1993) reported a positive correlation between block designs and metaphor fluency for their English-speaking sample; these two measures were unrelated in the present sample.

Discussion

The results provide mixed support for our prediction of a negative relationship between measures of FDI and measures of L2 communicative production. The predicted relationship held for two distinct measures of FDI (block designs and embedded figures test) and two types of measures of L2 oral communication (the ESL teachers' rating of their students' pragmatic competence in English, and measures of the amount of information students conveyed in an English-language interview—i.e., number of explicit T-units, number of simple T-units, and number of error-free

Table 4

Summary of Simultaneous Regression Analysis Predicting Total T-Units for ESL Sample (n = 29)

Variable	*B*	*SE B*	β
Intercept	–175.88	53.89	0.00
Vocabulary	1.39	0.34	0.55*
GEFT	–1.12	0.27	–0.55*

Note. $R^2 = .55$ ($p < .001$).
*$p < .001$.

T-units). Contrary to prediction, a third communicative measure—metaphor fluency—was unrelated to the cognitive style measures. The fact that the negative correlation was not restricted to single measures argues in favor of interpreting the results in terms of the intended constructs: Field dependence–independence and L2 communicative production. Results for two L2 communicative measures support the claim that a more field-dependent style is adaptive for certain aspects of L2 proficiency.

These results are consistent with theoretical predictions that previously have found little empirical support in the literature on learning and cognitive style (Carter, 1988; Chapelle & Roberts, 1986; Davis, 1991; Hansen & Stansfield, 1981; Skehan, 1989; Witkin & Goodenough, 1977). The interpersonal orientation characteristic of field-dependent subjects (i.e., attentional focus on others; Witkin & Goodenough, 1977, 1981) and their information-processing bias (i.e., attentional focus on overall, holistic patterns; Pascual-Leone, 1989) may be conducive to the acquisition of aspects of L2 communicative proficiency or at least to communicative expression in the ESL classroom and in a conversational interview.

Results of the present study extend Johnson and Rosano's (1993) findings to additional measures of FDI and communicative production, but the present study failed to replicate the previously obtained negative correlation between metaphor fluency score and measured FDI. The lack of correlation between metaphor fluency and other measures of communicative production in the present sample calls into question the validity of metaphor fluency as a measure of L2 communication. It is also possible that the metaphor fluency measure is sensitive to contextual factors, which compromises its reliability. Johnson and Rosano reasoned that metaphor fluency score could provide an index of subjects' communicativity in the second language, insofar as it reflected willingness to continue communicating beyond the minimal requirement of one interpretation per metaphor item, and correlations with the metaphor fluency score supported this interpretation in their ESL sample.

In Johnson and Rosano, the metaphor interview was the first task presented to the participants, and this might have led them to perceive it as a communicative context, as well as a cognitive task. In the present study, participants were first asked to tell the interviewer about their hometown and favorite sport or hobby; the metaphor items were presented after this conversational situation. It may be that coming after a 4-minute conversational interview, the communicative aspect of the metaphor task was diminished.

Other researchers have found that a field-independent style provides some advantage on certain measures of L2 academic proficiency (see Chapelle & Green, 1992, for a review of this literature). For the vocabulary and analogies measures used in the current study, there was no evidence for such an advantage.

The vocabulary measure proved useful, however, in discriminating sources of variance in the T-unit score. Total T-units had a strong negative association with the FDI measures and an equally strong positive association with vocabulary. Yet there was no association between measured vocabulary and FDI. This suggests that amount of information conveyed in the L2 conversations was associated, relatively independently, with knowledge of the language and with stylistic (or strategic) processing factors. Vocabulary score and GEFT score combined to account for over 50% of the variance in total T-units produced by the ESL group. Chapelle and Green (1992) have argued that knowledge and strategic competence come into play, to some extent, in any language task. The strategies appropriate for a given language task may account for the degree and direction of the association with cognitive style.

What might be the basis for the relationship between FD cognitive style and communicative production in the conversational task, obtained in the present study? Other researchers have suggested that the interpersonal orientation of FD people, and their greater alertness to social cues, may lead them to acquire better communicative competence in the second language. There has been little empirical support for this claim, however, on the basis of communicative proficiency measures employed in past

research (e.g., Carter, 1988; Chapelle & Roberts, 1986; Hansen & Stansfield, 1981). There is some evidence that different types of instruction may be optimal for FD versus FI students (Davis, 1991; Rollock, 1992). Abraham (1985) found that rule-based instruction was more conducive to learning in FI students, whereas example-based L2 instruction was more conducive to learning in FD students. Such results are consistent with claims that FD students may learn better in situations where cues embedded in the context support learning (e.g., Globerson, 1989; Zambito, 1998).

Witkin and Goodenough (1981) proposed that the interpersonal orientation of FD persons is grounded on their need for access to external referents. This suggests that the social dispositions of FD people could, at least in part, derive from more basic cognitive processing biases. In the introduction to this article, we summarized Pascual-Leone's (1989) model of cognitive processing dispositions that underlie the FDI dimension. According to Pascual-Leone, FIs tend to perform better than FDs in task situations that are *misleading* (that is, in situations in which features of the context serve to highly activate mental schemes that are irrelevant to correct task performance). In task situations that are *facilitating* (i.e., in which mental schemes are highly activated by contextual features that are conducive to correct performance), however, one should expect either no FDI effects or possibly an advantage for FDs.

Let us examine our main communicative measure (number of T-units produced in a face-to-face monologue situation) in light of Pascual-Leone's model of FDI. There appear to be no misleading aspects to this situation. The situation is rather facilitating, in that everything the participant knows about the language and the topic is potentially relevant. One can see this situation as a kind of free recall task, in which the participant must repeatedly probe his or her long-term memory, without mentally interrupting information that comes to mind. Such a situation may better fit the processing characteristics of FD than of FI persons, since, according to Pascual-Leone, FIs but not FDs have the disposition to automatically interrupt mental content they are not currently

attending to (i.e., have a more focused mental attention). But if so, why is a relationship with FDI obtained only for the ESL group? It is likely that given the massive practice the native English-speakers had had in communicating in their first language, differences due to cognitive style had little impact in them. In contrast, relevant communicative skills should have been less overlearned, in the context of English, for the ESL group, and thus stylistic factors would have had a greater chance to exhibit themselves in performance (cf. Davis, 1991). Note that the claim that FIs have a greater tendency to apply central attentional interruption is consistent with the finding (Abraham, 1983; Jamieson & Chapelle, 1987) that GEFT performance is positively related to amount of monitoring (as defined by Krashen, 1981) of L2 output.

There is another aspect of the conversational measure used in the current study that may be congenial with a more field-dependent processing style. Pawley and Syder (1983) argue that nativelike speech consists, to large extent, of memorized sequences and lexicalized sentence stems. "A lexicalized sentence stem is a unit of clause length or longer whose grammatical form and lexical content is wholly or largely fixed" (Pawley & Syder, 1983, p. 191). Use of such overlearned sequences may lead to increased production in an L2 conversation task, but may be of no advantage on academic language measures, which may call for more analytical language skills. According to Pascual-Leone's model of FDI, FDs are good at content learning, which leads them to have a rich repertoire of automatized, content-bound knowledge structures. FIs, in contrast, excel at acquiring more abstract, generalized knowledge structures. The learning style of FD persons may thus provide an advantage for learning L2 lexicalized sentence stems, which in turn may lead to more fluency in a conversational context. The high correlations between the FDI measures and the number of simple T-units (combined with the absence of correlation with complex T-units) is consistent with this interpretation.

Do our results simply reflect better performance by FD ESL students on a given monologue task? The negative correlations

between scores on FDI tasks (block designs and GEFT) and the teachers' rating of students' communicative proficiency, in the current study and in Johnson and Rosano (1993), suggest that the effect may extend beyond performance on a particular task. The teachers' rating concerned degree of difficulty in communicating in various pragmatic contexts, as well as skill level in various aspects of communication. It must be acknowledged, however, that the correlations between teachers' ratings and FDI measures in the current study were low, and that teachers' ratings might have been influenced, at least in part, by the social orientation of the FD students, independent of their L2 communicative ability.

In sum, results of the present study support the claim that field dependents, as opposed to field independents, may perform better on L2 tasks that emphasize communicative more than formal aspects of language proficiency. This support is strongest for the T-unit measure of amount of information conveyed in an L2 conversation. These results have theoretical implications for the FDI construct. The present results provide partial support for the bipolar cognitive-style conception of the FDI dimension and argue against conceptions of FDI that would reduce it to differential manifestation of cognitive or spatial abilities.

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