Learning How to Use Input-Based and Output-Based Form-Focused Instruction: A Meta-Analytic Comparison of Persian EFL Learners

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Abstract

Form-Focused Instruction (FFI) has been extensively studied, yet past experimental results are often inconsistent or even contradictory. Overly simplistic examinations of grammatical complexity and learner characteristics (e.g., L2 English proficiency) may have fueled the confusion, limiting understanding of how different FFI techniques can be effectively introduced. To address the need for further research, 18 studies with Persian English as a Foreign Language (EFL) learners were selected for meta-analysis. Effects of type of FFI (input vs. output-based) were analyzed along with other influences of acquisition (i.e., complexity of a target feature and learner proficiency in English). Results revealed that less complex grammatical features tend to benefit more from input-based FFI, whereas complex features with multiple phrases or clauses tend to benefit more from output-based FFI. Input may provide form-meaning mapping needed for morphology, while output-based instruction may push learners to attend to word order, which is needed for syntax. Results also suggest that L2 English proficiency is a moderating factor of effectiveness. Taken collectively, outcomes of the meta-analysis imply that different forms of FFI should be strategically chosen based on grammatical difficulty and learner characteristics.

Keywords: form-focused instruction, input, output, Persian, L1, L2, EFL, grammar

Introduction

Form-Focused Instruction (FFI), which refers to "any pedagogical practice aimed at drawing learners' attention to language form" (Collins & Ruivivar, 2020, p. 472), has been extensively studied (Ellis, 2001; Long & Robinson, 1998; Piggott, 2019; Sun & Zhang, 2021, 2022). Originally, FFI emerged because of French immersion programs in Canada and intensive English as a Second Language (ESL) programs in the United States, whose primary focus on communication tended to impede the development of grammatical accuracy. Recognizing a need for additional emphasis on grammar in the 1990s, several effective FFI techniques were developed to complement communicative and content-based language learning approaches in both ESL and EFL contexts (Ranta & Lyster, 2017).

Although there are now a variety of FFI techniques to emphasize grammatical features, these techniques generally fall into two categories based upon emphasis of either input or output. Input-based FFI, which highlights a grammatical feature through bolding or underlining, referred to as input enhancement, appears to positively impact acquisition (Rassaei, 2012, 2015; Sarkhosh et al., 2013), as does adding more examples of a target feature to reading or listening activities, a technique known as input flood (Rassei, 2012). Processing Instruction (PI) is yet another technique to cultivate awareness of grammatical features (Benati, 2005; Comer & deBenedette, 2011; Kim & Nam, 2017). It helps learners process input via the following three steps (Sheen, 2007):

1. Learners are provided with explanations of the grammar.
2. Learners are alerted to problems they may encounter with the input, particularly those caused by differences between the grammar of the target language and the L1.
3. Learners then do exercises in which they need to understand the structure in order to understand the meaning.

As indicated above, PI provides an explanation of grammar rules and negative evidence concerning potential issues with input. This information is then followed by input-based tasks that help learners understand and process a target form (Nassaji & Fotos, 2011).

Research suggests that input-based FFI promotes acquisition of grammatical features, yet results are far from consistent. Some studies, for example, suggest that input enhancement has little to no impact on the production of a target feature (Cho, 2010; Lee & Huang 2008, Leow et al., 2003), whereas other research contends that it aids in "learning of the target forms while having unfavorable effects on meaning comprehension" (Lee, 2007, p. 87). Concerning input flood, some research also provides unfavorable criticism, suggesting effects of this approach may be small and ephemeral (Reinders & Ellis, 2009). Taken collectively, both forms of FFI appear to have some limitations. This perspective is supported by Rassaei (2012), whose experimental study showed that both input enhancement and input flood were the least effective means of cultivating accuracy in written production tasks. Like other forms of input-based FFI, PI has revealed key limitations. In a study by Benati (2005), PI was shown to have "clearly altered the way learners processed input" (p. 83), yet the technique had little impact on actual production of the target feature. The study used traditional instruction, meaning based instruction, and PI to emphasize the past tense among Chinese (n=47) and Greek (n=30) secondary school learners. Results revealed that production tasks for the PI group were less accurate than those from either the traditional (explicit) or meaning-based instruction groups (Benati, 2005). Similar findings were revealed in another study of Russian prepositional phrases, whereby traditional pattern drills had a larger impact on productive tasks than PI (Comer & deBenedette, 2011). Such results have led some scholars to conclude that FFI is largely superfluous (VanPatten, 2014).

As in the case of input-based FFI, output-based emphasis of grammatical features has had mixed results. Output-based instruction refers to any task which compels a learner to produce a target feature in speech or writing. Having learners narrate images to tell a story in the past tense is just one example. The utility of output-based FFI was first explained by Swain (1998), who pointed out that compelling production of speech or writing results in hypothesis testing and metatalk, which refers to group discussion of a target feature among peers. Several studies confirm assertions that output-based FFI supports acquisition of a target feature (Izumi, 2002; Rassaei, 2012; Shintani, 2011). In an experimental study by Rassaei (2012), learners who received meaningful output with the target feature surpassed their peers who received input enhancement or input flood, revealing heightened accuracy and L2 knowledge. Although seemingly effective, other studies suggest that output-based FFI is not as beneficial as its input-based counterpart (Izumi & Bigelow, 2000). This view is supported by Sintani (2011), who found that both comprehension (input) and production (output) activities had positive effects, yet the input-based tasks led to higher gains on a comprehension test. Izumi and Izumi (2004) even concluded that the output tasks failed "to

engage learners in the syntactic processing that is necessary to trigger L2 learning, while the task for the non-output group appeared to promote better form-meaning mapping" (p. 587).

Although several studies have examined both input and output-based forms of FFI, results are often inconsistent or even contradictory. Without an ability to effectively predict outcomes of FFI, educators must rely on intuition or universal, one-size-fits-all strategies for the emphasis of grammar. Problems predicting the accuracy of FFI may be explained by diverse characteristics of grammatical features, which vary along a morphosyntactic continuum of difficulty. Research suggests that these differences predict when a target feature can be acquired, thereby affecting the efficacy of an FFI technique (Gholami & Zeinolabedini, 2018; Pienemann & Lenzing, 2015). While insightful, the research has only examined a limited number of grammatical features and FFI techniques.

Additional studies are needed to better understand how grammatical variability and diverse pedagogical techniques impact the efficacy of FFI. When outcomes can be consistently predicted, FFI will become more useful for educators or educational software developers, who need to tailor pedagogical strategies to individual learner needs. To provide a comprehensive perspective needed to predict FFI outcomes, this paper examined input- and output-based instructional techniques in selected existing studies using meta-analysis. Meta-analysis allows for comparison of several different grammatical features and multiple experimental studies, heightening understanding of how morphosyntax can influence each FFI style.

Reasons for Variability of Results: A Closer Look at Grammatical Features

Effectiveness of input-based and output-based instruction may be significantly influenced by grammatical differences. Research suggests, for example, that three discrete categories of morphosyntactic complexity (intra-phrasal, inter-phrasal, and clausal) affect the degree to which FFI is effective (Dyson, 2018; Dyson & Håkansson, 2017; Pienemann, 2005; Pienemann & Lenzing, 2015). Due to differences in grammatical difficulty, each target feature also requires a specific level of English proficiency before it can be acquired, suggesting that timing of an FFI technique is important (Gholami & Zeinolabedini, 2018; Pienemann & Lenzing, 2015). Clearly, morphosyntactic characteristics have a large impact on the efficacy of FFI. This impact is further explained in the following section, along with gaps in our understanding which require additional research.

According to the Processability Theory, specific target features are, in fact, teachable when grammatical complexity is just above a learner's English proficiency level (Dyson, 2018; Dyson & Håkansson, 2017). First, learners can acquire grammatical features that modify one phrase, such as a verb (e.g., past -*ed*) or noun (e.g., plural -*s*). As English proficiency increases, EFL learners can acquire inter-phrasal features, which require the manipulation of multiple phrases for construction. An example would be subject and auxiliary verb inversion in a yes/no question. Another example would be the addition of a third person singular -*s* morpheme, which requires an inter-phrasal understanding of the subject and verb for correct conjugation (e.g., He eat*s*). Inter-phrasal features have some syntactic elements that require ordering of multiple words or phrases, which increases difficulty. Finally, learners can acquire grammatical features that include subordinate clauses (e.g., conditionals, relative clauses, embedded questions, etc.). These grammatical features have even more syntactic complexity than both intra and inter-phrasal target features.

As suggested by the Processability Theory, learners may benefit from FFI only when English L2 proficiency is sufficient for the acquisition of a target feature (Gholami & Zeinolabedini, 2018; Pienemann & Lenzing, 2015). This theory may be the key to explaining inconsistency of past FFI studies, which do not adequately explore the influences of L2 English proficiency level. Studies that provide FFI at different times tend to focus on single experimental tasks (Xu & Li, 2021, 2022), which fail to identify how the effectiveness of FFI techniques change as a learner's English proficiency develops over time.

In addition to problems with the timing of FFI, types of grammatical features chosen for study often include overly simplistic classifications such as easy or difficult; simple or complex; and early or late (Spada & Tomita, 2010; Van De Guchte et al., 2015; Varnosfadrani & Basturkmen, 2009; Wang & Jiang, 2015). This oversimplification may stem from past designations of Ferris (1999, 2006), who classified grammar based on systematic features (e.g., the past regular tense or English article) and lexical features (e.g., past irregular tense). In reality, grammar varies more than simplistic classifications would suggest. Rather than being a binary construct, grammatical features are more complex. They vary in complexity based upon intra-phrasal, inter-phrasal, and clausal characteristics (Pienemann, 2005). Further examination of FFI that comprehensively examines the relationship between grammatical complexity and L2 English proficiency may heighten our ability to predict FFI outcomes.

While research of the Processability Theory has already been conducted (Dyson, 2018; Dyson & Håkansson, 2017; Pienemann & Lenzing, 2015), the number of grammatical features examined through these studies remains limited. In addition, these studies do not adequately explore the influences of input and output-based forms of FFI on the process of acquisition. Meta-analysis can provide new insights about grammatical complexity and its impact on input- and output-based instructional techniques. Using the Processability Theory as a guide for examination, several experimental studies can be compared via meta-analysis, yielding information about the effects of FFI with a variety of grammatical features. Such study may provide a more holistic perspective, giving educators the knowledge needed to make grammar instruction more effective and efficient.

Research Questions

The present meta-analysis was designed to examine the impact of grammatical complexity and L2 English proficiency levels on the effectiveness of input- and output-based FFI techniques. To guide the investigation, the following questions were posed:

1. What styles of FFI instruction (input-based or output-based) are most effective with each type of grammatical feature (intra-phrasal, inter-phrasal, and clausal)?
2. Does the effectiveness of an instructional style (input-based or output-based FFI) differ according to the English L2 proficiency level of a learner?

Through examination of the questions above, it was hoped that a more holistic perspective of FFI could be provided, thereby allowing educators to use different FFI techniques in a more timely and effective manner. This may finally allow for the adaptation of theory to practice.

Method

The present meta-analysis examined the impact of variables such as grammatical complexity (intra-phasal, inter-phrasal, and clausal), type of instruction (input-based vs. output-based), and learner background (L2 proficiency) on accuracy of production in English speech or writing. Only studies that used participants with the Persian L1 were collected. This ensured that different L1s did not impact the findings. To obtain studies of EFL learners with the Persian L1, Google Scholar was systematically searched by using the keyword Persian with various search terms for grammatical features (*plural, past tense, past regular, past irregular, passive, third person, questions, article, definite article, indefinite article, phrasal verb, verb particle, conditional*) and types of FFI treatments (*form-focused instruction, focus-on-form, focus-on forms, PI, text enhancement, dictogloss, output, input, control group*). Following the search, 89 potential studies were located and full texts for each study were obtained for further examination.

There are differences between explicit knowledge (grammar rules that can be consciously described or explained) and implicit knowledge (accuracy when naturally speaking or writing). A learner who consciously knows a grammar rule may still not be able to effectively use it in practice. Therefore, only studies that elicited responses in speech and writing were selected. To ensure that production reflected implicit knowledge of a target feature, testing was selected that communicated ideas, not rules; put pressure on learners to prevent conscious correction of language errors; focused on meaning not form; and avoided use of metalanguage (Ellis, 2009). In order to be included within the present meta-analysis, each experimental study needed to have:

1. An input-based or output-based treatment (including time for treatment and methods of delivery)
2. Pretest and Posttest measures of production (either oral or written)
3. Information about the type of grammatical feature targeted
4. Participants that used only the Persian L1

Information about proficiency was often variable and inconsistent. Studies that did include this variable were placed in basic categories such as beginner, intermediate, and advanced for further examination.

Many of the original 89 studies chose to evaluate grammatical accuracy through untimed multiple-choice tests or similar measures, which did not evaluate implicit knowledge or production skill. Studies lacking adequate assessment of productive and implicit knowledge were excluded from the meta-analysis. In addition to problems with assessment of production, some studies lacked sufficient information needed to understand the methodology or length of treatment. For example, a number of studies failed to provide enough information needed for the calculation of effect sizes, providing only posttest scores for experimental and treatment groups. Other studies failed to indicate precisely how many treatments were provided and lacked information about the time period in which these treatments were delivered. Such studies were excluded. After applying the inclusion criteria, the present meta-analysis contained 18 studies for analysis (see Appendix B for information on treatments and assessments of productive knowledge).

Grammatical Feature Type

Types of grammatical features were organized using the Processability Theory into intra-phrasal, inter-phrasal, or clausal features (Pienemann & Lenzing, 2015). Grammatical features from the experimental studies were categorized as in Table 1 (see Appendix A for information about target features used in each study).

Table 1

Separation of Grammatical Features Based on Processability Theory

	Target Features (Persian Studies)	
Intra-phrasal	● Single adjectives, verbs, and nouns (1 Study)	
	● Verb tenses (2 Studies)	
	● Modals (2 Studies)	
Inter-phrasal	● Collocations with multiple phrases - combined adjectives, nouns, and verbs (2 Studies)	
	● Passive voice (5 Studies)	
	● Causative (2 Studies)	
Clausal	● Conditional (1 Study)	
	● All Errors in Clause – t-units (1 Study)	
	● Relative Clauses (1 Study)	
	● So and Such + That (1 Study)	

In total, 41 treatment groups were obtained from the 18 selected studies (11 intra-phrasal, 21 inter-phrasal, 9 clausal).

L1 Transfer

There were 41 treatment groups for analysis, all of which examined Persian L1 English learners exclusively. Using EFL learners with the same native language helped to ensure that transfer from diverse L1s did not impact the findings. Persian shares some lexical, morphological, and syntactic attributes with English, which are factors that may influence how a second language is acquired (Luk & Shirai, 2009; Maleki, 2006; Shin, 2015). Some grammatical features emphasized in the studies have key similarities to English.

Concerning intra-phrasal features like verb tense, Persian parallels English in a number of ways. It uses a past tense verb that is completely different from the present form (similar to lexical past in English) ("Persian in Context," 2013, p. 9). Concerning the future tense, it "is used almost exactly like the English future tense; the only difference being that it is also very common in Persian to use the present tense for expressing future actions" (Mazdeh, 2013, para. 1). Concerning aspect, Persian is similar to English in usage. The present perfect aspect, for example, adds a present copula to the past participle, which parallels the English form. This similarity suggests that "By and large, the Persian present perfect, sometimes referred to as past narrative, corresponds to the English present perfect" ("Grammar and Resources," 2007, para. 3). Finally, both English and Persian have an article system. Unlike English, however, only the indefinite article is used in Persian. Nouns that do

not have an indefinite article are considered to be definite (Momenzade, & Youhanaee, 2014).

    Concerning inter-phrasal features, syntactic elements have some key differences from English. For example, Persian uses an SOV word order and lacks question inversion, which differs significantly in how sentences are constructed in English. Although creating an intransitive verb for the passive is similar in both languages, SVO word order makes the English passive more challenging for Persian learners. Alternative means to express the passive in Persian, along with very infrequent use of the structure in the L1, also make this grammatical feature challenging for Persian learners (Ghorbani & Sherafati, 2015). Causative grammar, which provides an agent who compels another person to perform an action (e.g., His mother got him to mow the lawn) is very different in Persian. Although placement of syntactic elements is the primary method of denoting this type of grammar in English, Persian can use morphological endings on nouns to denote the causative (Birjandi & Rahemi, 2009).

    Concerning clausal features, Persian relative clauses are head initial, as in English. However, there is a difference in word order of constituents in the Persian relative clause. Persian conditionals are similar in structure to those of English. In Persian conditionals, for example, the Persian word for if is a free morpheme that is generally used at the beginning of the conditional clause, followed by a main clause which uses the future tense. Despite Persian being a head-final language in sentence structure, the if marker appears at the beginning of the conditional clause, as in English (Abdollahi-Guilani et al., 2012).

Proficiency Level

    Studies chosen for meta-analysis included a variety of proficiency designations such as low beginner, beginner, high beginner, intermediate low, intermediate, and high intermediate (see Appendix A for information on proficiency levels). These designations were separated into beginner, intermediate, and advanced levels for statistical analysis. Only 28 of the 41 treatment groups had designations for proficiency, none of which were advanced. Groups were separated into beginner (7 treatment groups) and intermediate (21 treatment groups). Of the 18 studies, 13 included information needed to assess proficiency level. Information provided (or not provided) concerning proficiency levels confirms assertions by Liu and Brown (2015), who contend that methodological inconsistencies have limited our understanding of ESL and EFL instruction.

    It is important to note that proficiency levels must be interpreted with caution. Because different instruments were used to assess proficiency, discrepancies between assessment of proficiency may be expected. To some degree, assignment of proficiency levels in selected studies reflects the researcher's judgment, meaning that this variable cannot be interpreted as a standardized form of assessment. It must be considered a construct of the researcher, similar to variables obtained from survey data. Classifications of proficiency level may reveal some trends that can be confirmed later through follow-up experimental research with more standardized instruments. To further understand the collated results of this proficiency variable, qualitative examination of proficiency levels in each individual study was conducted, so that co-dependencies with other variables (grammar type and L2 English Proficiency) could be better understood.

Input-Based Output-Based Definitions

Studies designed to evaluate the efficacy of FFI were selected and separated based on instructional type (see Appendix B for information about treatments). Whereas treatments primarily designed to emphasize the impact of input (e.g., input flood, IE, and PI) were assigned to the input category, tasks that emphasized output (e.g., text reconstruction or dictogloss) were assigned to the output category. Any studies that sought to emphasize both input and output in the same FFI treatment were excluded from analysis. Control groups with no treatment were also excluded from analysis.

Overall, output-based treatments included a variety of both written and spoken tasks. As an example, a study by Fakharzadeh and Youhanaee (2012) included individual text reconstruction, close translation, and a dictogloss. Among these tasks, production in the form of writing may be expected, along with verbal production associated with the dictogloss. Metatalk may also be expected, as learners share information about a story to reconstruct a text. With the exception of studies that used only the dictogloss, there was little standardization of techniques used to elicit output. While forms of production did vary, Swain (1998) points out that all production tasks give learners the ability to use and test hypotheses about a target feature. Some output groups did include a degree of explicit information or guidance to conduct the activity, which was a type of input. In each treatment, however, emphasis was placed on producing output, rather than providing input. Studies that used a dictogloss, for example, required input before the story was reconstructed. However, the main goal of the activity was output, as reflected by procedures that included note-taking, meta-talk, and story construction. Although some input may have been provided with output treatment groups, the main goal of these groups was to produce either an oral or written product.

Procedure

In order to compare results from individual studies, effect sizes needed to be calculated. An effect size helps to determine how effectual a treatment is. It also provides a consistent and standardized measure to compare different studies.

Cohen's *d* was used to calculate effect size, as in the study by Spada and Tomita (2010), which analyzed results of explicit and implicit instruction on the acquisition of simple and complex grammatical features in English. The statistic was calculated by inserting pretest scores (M2), posttest scores (M1), and associated standard deviations (SD2 and SD1) into Cohen's d formula (Spada & Tomita, 2010):

$$d = [M1 - M2] / [SQRT[(SD1SD1 + SD2SD2]/2]$$

After calculations were completed for each treatment group, results were collated based upon the variables selected for study, allowing for further analysis. For grammatical complexity, effect sizes were combined based upon whether an intra-phrasal, inter-phrasal, or clausal feature was emphasized. For the proficiency level, they were combined according to researcher designations of beginner or intermediate (there were no advanced levels). Results were then subdivided based upon instructional type (input or output) for further analysis.

Results and Discussion

Instruction Based on Target Feature

Research question one, which sought to investigate the effects of grammatical complexity on the efficacy of different FFI styles, yielded some interesting results (See Table 2). Input-based FFI was only slightly more effective when used with intra-phrasal grammatical features (a difference in effect size of .06). At the inter-phrasal level, input-based instruction had a much larger impact than its output-based counterpart, yielding a difference in effect size of .72. Because prior research of meta-analyses suggests that effect size can be small $d > 0.2$, medium $d > 0.5$, or large $d > 0.8$ (Rice & Harris, 2005), the difference at the inter-phrasal level may be considered a medium difference in effect. The finding appears to suggest that input-based FFI is more effective when inter-phrasal grammatical features are emphasized.

The larger influence of input may reflect characteristics of both intra-phrasal and inter-phrasal features, which emphasize single words and associated morphology that requires form-meaning mapping. Verb tenses, collocations, modals, and comparative adjectives from these categories all benefited more from input. In the case of grammatical features that are morphologically challenging, input-based instruction may prime the learner by providing information for form/meaning mapping.

Table 2

Average Effect Size by Grammatical Complexity and Type of Instruction

	Input-Based Vs. Output-Based	Mean	N	Std. Deviation
Intra-phrasal	Input	3.7975	5	3.20277
	Output	3.7405	6	2.73231
Inter-phrasal	Input	3.5031	12	2.61523
	Output	2.7787	9	2.72752
Clausal	Input	3.0655	5	2.67831
	Output	4.1901	4	3.36726

Output-based instruction was more effective when more complex, clausal features were emphasized (Table 2). At the more complex clausal level, the difference in effect was 1.12. This difference is sizable, representing a large effect. At the clausal level, learners have to master more complex syntax that requires ordering of constituents, which may explain why output-based FFI was more effective. Output-based instruction forces the learner to process hypotheses concerning word order, which may heighten the acquisition of syntax.

Examination of individual studies that investigated both types of FFI confirm the results revealed by collation of effect sizes. Target features that consisted of words and associated morphology benefited more from input-based instruction. Past, present, and future verb tenses had more substantial gains when input was used (Modirkhamene et al., 2018; Moradi & Farvardin, 2016), as did collocations of with nouns, verbs, and adjectives (Gholami & Farvardin, 2017). Results appear to confirm that morphological features are more readily acquired from input-based instruction, which promotes form-meaning mapping. In contrast,

inter-phrasal and clausal features often benefited more from output-based instruction. Causatives (Birjandi & Rahemi, 2009; Fahim & Ghanbar, 2014), relative clauses (Younesi & Tajeddin, 2014), and so/such clauses (Rassaei, 2012) each had more substantial gains from output-based instruction, which may suggest that syntactic elements were improved through this form of FFI.

As for the inter-phrasal passive, three studies revealed a higher effect for input-based instruction (Baleghizadeh, & Saharkhiz, 2014; Dabiri, 2018; Farahian & Avarzamani, 2019), whereas two studies revealed a higher effect for output-based instruction (Birjandi et al., 2011; Rahemi, 2018). This feature combines complex elements of both morphology and syntax. In the case of *The book was written*, for example, a past auxiliary (*was*), and the past participle (*written*) must be lexically retrieved. If the main verb is regular, the morphological -*ed* must be attached, adding further complexity to the feature. Such morphological elements may benefit from input-based instruction, whereas output-based instruction may help with complexity of syntax, whereby the object of an action is brought to the beginning of a sentence. As illustrated by this example, alternate forms of FFI may target different characteristics of a grammatical feature, explaining variability of findings when the passive is emphasized. While an intriguing idea, more research is needed to confirm the veracity of this claim.

Complexity of an English grammatical feature appears to have a significant influence on the efficacy of input and output-based FFI, yet L1 transfer may also have some impact. Experimental studies that examined features similar to the L1 had higher values for input-based instruction. Verb tenses (Modirkhamene et al., 2018; Moradi & Farvardin, 2016) and the conditional (Khani & Davaribina, 2013), for example, benefitted more from input-based FFI. This finding could suggest that positive transfer occurs when input includes English target features that are similar to the L1. In contrast to input, output may force learners to address English grammatical features that are highly disparate from the L1, explaining why the passive voice, causative, relative clause, and so/such clauses benefited more from output-based FFI.

Influences of English Proficiency on Effectiveness of FFI

Separation of effect size based upon both proficiency and type of instruction (input vs. output) revealed some notable differences (Table 3).

Table 3

Mean Effect Sizes for Input and Output-Based Instruction at Two Proficiency Levels

	Input-Based vs. Output-Based	Mean	N	Std. Deviation
Beginner	Input	.9881	3	.47352
	Output	.9355	4	.72463
Intermediate	Input	3.6230	12	2.64936
	Output	3.3086	9	2.61079

Input-based instruction was more effective at both the beginner and intermediate levels. At the beginner level, the difference was .05, which is a nominal difference in effect.

However, at the intermediate level, the difference was slightly more substantial, yielding a small effect (difference of .31). Input may serve as a scaffold for learners who have not had substantial exposure to a target feature, explaining the findings. It is also important to note that both types of FFI have much higher effect sizes for intermediate learners. This finding may suggest that FFI is more effective at an intermediate level of proficiency.

Although findings from the collation of proficiency levels was limited, analysis of individual studies appeared to reveal a relationship between English L2 proficiency and grammatical complexity of the target feature. Whereas complex grammatical features tended to benefit more from input-based FFI when proficiency was low, simplistic grammatical features tended to benefit more from output-based instruction when proficiency is high. This perspective is supported by two FFI studies that focused on the intra-phrasal modal (Fakharzadeh & Youhanaee, 2015) and the clausal conditionals (type 1 and 2) (Khani & Davaribina, 2013). Both studies used intermediate learners but had very different results. When modals were emphasized, output-based instruction was superior, whereas input-based instruction was superior when conditionals were emphasized. The finding may suggest that output benefits learners who are practicing a more simplistic grammatical feature to which they are already familiar. In contrast, input may serve as a kind of scaffold for more complex features that are just beyond a learner's ability. Interestingly, this relationship between English proficiency and grammatical complexity appears evident within past research of Corrective Feedback (CF). Input-providing CF (e.g., recasts) tends to be more effective for the past tense at beginner proficiency levels, while output-prompting CF (e.g., prompts) tends to be more effective with the past tense at the intermediate level of proficiency (Author, 2020; Author, 2021). Collectively, results from the present study, as well as those obtained from prior research of CF, suggest that grammatical complexity and English L2 proficiency influences the effectiveness of input and output-based FFI. Although the present meta-analysis included only one experimental study of the past tense, it predictably yielded a larger effect size for input-based FFI when used with elementary EFL learners (Modirkhamene et al., 2018). Unfortunately, a study emphasizing the past tense with intermediate learners was unavailable for the present meta-analysis, limiting our understanding of how English L2 proficiency level can impact the learning process. Inadequate exploration of the past tense with EFL learners at different proficiency levels reveals a larger problem. Past experimental studies of FFI are fragmentary, examining only a limited number of grammatical features and proficiency levels. More comprehensive studies are needed to better understand the relationships between grammatical complexity, proficiency level, and the effectiveness of input-based and output-based FFI.

Conclusion

Results of the present meta-analysis provide key insights for the delivery of input-based and output-based FFI. Analysis of grammatical complexity suggests that input-based FFI is more effective for less complex intra- and inter-phrasal features, which include more morphological elements. Input-based instruction may help learners to concentrate on form-meaning mappings, without a need to worry about syntactic elements (word order of multiple phrases and clauses). Output-based instruction appears to be effective for clausal features. Because this style of FFI forces learners to attend to word order, it may be more effective when used with complex sentences.

While forms of FFI appear to target different characteristics of grammatical features, efficacy may be moderated by English proficiency. When proficiency level is high in relation to grammatical complexity, learners tend to benefit more from output-based FFI, which forces learners to test hypotheses and use a grammatical feature in practice. When proficiency level is low in relation to grammatical complexity, learners appear to benefit more from input-based instruction. Findings appear to suggest that input serves as a kind of scaffold for learners who need extra help with a grammatical feature, whereas output helps learners use prior knowledge to correctly produce a target structure.

Results of the present study have implications for real-world language learning and teaching. Rather than using a one-size-fits-all strategy to emphasize grammatical features, educators may select different forms of FFI to maximize impact. For example, students at beginner or intermediate levels of English proficiency may be given input-based FFI, which allows a learner to attend to morphological form-meaning mappings associated with smaller phrases (e.g., verb tenses or plural nouns). Because information about grammar is embedded within the input, a learner can disregard more complex syntactic features and focus attention on smaller grammatical units, such as phrasal morphology. As students gain proficiency in the L2, they can be given more output-based FFI strategies with speaking or writing, which induce cognitive processing of word order variation associated with complex syntactic structures (e.g., relative clauses). Rather than using the same FFI strategy in all circumstances, educators may diversify FFI strategies based upon characteristics of the target feature and the learner, thereby maximizing effectiveness.

Although insights obtained from this meta-analysis are intriguing, methodological limitations make further research necessary. Past research selected for examination tended to analyze the same grammatical features, which provided only a limited perspective of how learners acquire a range of target structures. In addition, only one L1 was examined in the present study. Variability due to L1 transfer from different native languages should be considered within future research designs. Finally, past experimental studies selected for meta-analysis used different treatments and assessments that may have impacted the results. In the future, more controlled experimental or qualitative research is needed to provide an even more holistic perspective of FFI. With such a perspective, theory may finally be applied to practice. Educators may then be able to choose the most effective pedagogical techniques at the right time, thereby tailoring instruction to the needs of diverse learners.

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Appendix A
Studies of Input/Output Using Learners with Persian L1

Authors	Duration	Learner Proficiency	Grammar Feature
Rassaei (2012)	2 successive sessions untimed	No information given (*n*=134)	So and Such + That
Moradi & Farvardin (2016)	6 sessions (45 mins per session)	No information given (*n*=120)	past ed, past irregular, and future will
Farahian & Avarzamani (2019)	12 sessions each about 1 hour and a half	pre-intermediate with no knowledge of the English passive (*n*=51)	English passive
Birjandi et al. (2011)	3 Weeks / three passive tenses were taught and practiced in separate weeks	No prior knowledge of target structure (*n*=127)	English passive
Khani & Davaribina (2013)	treatment in one week	Intermediate (*n*=117)	Conditional (Type 1 and Type 2)
Fakharzadeh & Youhanaee (2015)	12 weeks and posttest the following weeks	Intermediate (*n*=77)	Modals
Azmoon (2021)	8 sessions	Beginner (elementary level) (*n*=56)	(*a/an/some/any, at/on/in, usually/sometimes/always/ never, first/then/after that/next/finally*)
Younesi & Tajeddin (2014)	4 - 90-minute treatment sessions	1st year English majors at university (*n*=139)	Noun Clauses (e.g., relative clauses) - *If, whether, that (the fact that), where (ever), when (ever), what (ever), how, who (ever), whom (ever), and which (ever)*

Gholami & Farvardin (2017)	4 Weeks - 5 collocations per week - 2- mins per session	Lower Intermediate Based on OPT (*n*=80)	COLLOCATIONS: noun + noun, adjective + noun, verb + noun, noun + verb, and adverb + verb structures
Fakharzadeh & Youhanaee (2012)	12 Sessions (Weeks 4 to 15) treatment received	intermediate according to OPT (*n*=52)	Modals
Dabiri (2018)	Treatment given from weeks 1 to 3	intermediate (*n*=90)	English passive
Modirkhamene et al. (2018)	3 consecutive sessions (2 hours each)	Elementary (*n*=40)	Past -*ed*
Rahemi (2018)	3 weeks (2 - 90 minute sessions per week)	Students who are one deviation above and below the mean (intermediate) (*n*=185)	English passives delimited to simple present, past, and future tenses
Fahim & Ghanbar (2014)	2 - 1 hour sessions in PI Group over 2 consecutive days	high intermediate adult EFL (*n*=56)	Causative *"my mother had me wash the dishes"* (first noun principle)
Birjandi & Rahemi (2009)	treatment phase 2 weeks	No prior information of structure (*n*=169)	Causative *"have"* or *"get"*
Baleghizadeh, & Saharkhiz (2014)	5 - 15 minute treatment sessions	lower intermediate adults (*n*=60)	the simple past passive structure
Sadeghi Beniss & Edalati Bazzaz (2014)	12 - 30 minute sessions through 4 week semester	upper intermediate (*n*=30)	All errors (T-Units) Assessed

Naseri & Khodabandeh (2019)	12 sessions (3 per week) over 4 weeks / all learners got the same collocations / 105 mins each session but only small time dedicated to teaching the collocations	intermediate (*n*=150)	15 adjective-noun and 15 verb-noun collocations on two topics of nature

Appendix B

Number of Treatments and Treatment Types

Persian Studies

Authors Number of Groups - Treatment Type – Effect Size	Assessment (pretest/posttest)
Rassaei (2012) 1 – Input (Input Enhancement) (d = 5.0152) 1 – Input (Input Flood) (d = 1.6376) 1 - Output (16 item completion task and verbal examples elicited from students) (d = 5.3603)	Written Production Task 22 items, 12 of which measured target (10 distractors) - Short narrative followed by a prompt
Moradi & Farvardin (2016) 1 – Input (Input Flood) (d = 5.5317) 1 – Input (Textual Enhancement) (d = 8.1578) 1 – Output (Explicit instruction of rules followed by output practice) (d = 6.5526) 1 – Output (Output activities that require exchange of ideas and the target structure) (d = 6.9265)	Written Production Task 30 items. Look at pictures and 20 past or future tense, other 10 questions distractors.
Farahian & Avarzamani (2019) 1 – Input (Processing Instruction) (d = 1.5347) 1 – Output (Dictogloss) (d = .7042) 1- Output (d = .5039)	Productive written tasks. Task 1: translation to Farsi / Task 2: fill in the blanks / Task 3: Read story and fill in the blanks
Birjandi et al. (2011) 1 – Processing Instruction (d = 1.3311) 1 – Output (d = 1.6493)	Test of production / 16 Controlled and 8 distractors
Khani & Davaribina (2013) 1 – Processing Instruction (d = 2.0006) 1 – Output (d = 1.8252)	Twenty-four production items which include high frequency vocab that the students know
Fakharzadeh & Youhanaee (2015) 1 – Input (Reading, Listening, and explicit information about the target feature) (d = 3.8685) 1 – Output (Dictogloss, text reconstruction, and cloze translation) (d = 4.8524)	42-item written test of production.14 items related to the target structure and the remaining 28 items related to other grammatical structures.

Azmoon (2021) 1 – Input (Processing Instruction) (*d* = .7259) 1 – Output (Dictogloss) (*d* = 2.0138)	Twelve sentences about six sequential pictures in the simple present tense while including some specific words (a/an, some/any, at/on/in, usually/sometimes/always/ never, first/then/after that/next/finally).
Younesi & Tajeddin (2014) 1 – Processing Instruction (*d* = 6.6212) 1 – Output (Text reconstruction cloze task) (*d* = 8.4164)	Written sentence-combination test (SCT) with 20 items.
Gholami & Farvardin (2017) 1 – Input (both text enhancement and input flood) (*d* = 8.7107) 1 – Output (required to make sentences with target collocations) (*d* = 5.4372)	A written productive collocation test containing 30 fill-in-the-blank items in which 10 items served as distractors.
Fakharzadeh & Youhanaee (2012) 1 – Output (dictogloss, individual text reconstruction, and corrected-close translation combined) (*d* = 1.5775)	The Timed Completion test (TCOM) was a 42-item written test with 14 items related to the target structure. The remaining 28 items were distractors.
Dabiri (2018) 1 – Processing Instruction (*d* = 2.1465) 1 – Output (production-oriented activities without mechanical components) (*d* = 1.8768)	25 production items with high frequency vocabulary that learners knew / based on textbooks
Modirkhamene et al. (2018) 1 – Processing Instruction (*d* = .7037) 1 – Output ("traditional instruction" – mechanical activities and communicative practice emphasizing target feature) (*d* = .5199)	Learners looked at pictures and made sentences to describe what happened.
Rahemi (2018) 1 – Input (Processing Instruction) (*d* = 1.3311) 1 – Output (60 production items requiring the participants to use passive-meaning oriented) (*d* = 1.6493)	Written production test included eight controlled picture-cued items with four calling for the target form and four distracters.
Fahim & Ghanbar (2014) 1 – Input (Processing Instruction) (d = 5.3768) 1 – Output (Dictogloss) (*d* = 8.9829)	A written pictorial sentence completion task in which the students completed each sentence related to each picture. Wholly, 15 sentences plus their pictures were given in this task.

Birjandi & Rahemi (2009) 1- Input (Processing Instruction) (d = 1.6178) 1 – Output (meaning-based pictorial and non-pictorial written tasks) (d = 1.7875)	Test consisted of 46 pictorial and non-pictorial items, all written. It was aimed at assessing the participants' interpretation ability (23 items) and their production knowledge (23 items)
Baleghizadeh, & Saharkhiz (2014) 1 – Input (Processing Instruction) (d = 8.1492) 1 – Input (Input Enhancement) (d = 3.1264) 1 – Input (Consciousness Raising - read simple past active and passive sentences and distinguished the differences between the two structures in pairs) (d = 4.3211) 1 – Output (Traditional grammar exercises that students answered in pairs) (d = 2.4173)	An oral semi-structured test: Describe 10 activities which were done at your home yesterday.
Sadeghi Beniss & Edalati Bazzaz (2014) 1 – Input Enhancement (Picture sequencing and other activities that don't require speaking) (d = .0529) 1 – Output (pushed output through picture description, retelling, ask and answer task and storytelling - speaking) (d = 1.1584)	IELTS speaking test from Cambridge IELTS books.
Naseri & Khodabandeh (2019) 1 – Input (Input Enhancement through text) (d = 1.9888) 1 – Input (Input enhancement through WhatsApp) (d = 2.4034)	Pretest - write a short story about a trip to a natural resort / Posttest - write a narrative summary from a crime movie you have watched