Research Article

Resurveying Corrective Feedback Meta-Analysis

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Corrective feedback (CF) is provided to learners to rectify errors. In recent years, the study of CF in oral and written forms has attracted considerable attention in language acquisition studies. Some studies have comprehensively summarized the effects of CF through meta-analysis, but there are still some differences and limitations in CF meta-analysis, which need to be resurveyed. Based on the findings of a meta-analysis of five different types of CF, this study evaluates the procedures, ideas, and conclusions of the CF meta-analysis. The findings show that different types of CF effects have inconsistent and conflicting findings because of different data sources, variable collinearities, learner differences, and effect generation differences. Consequently, the research systematically discusses the publication bias, the influence of learner variables, the method of measurement for each type of effect, and the connotations of the meta-analysis results.

1. Introduction

In the past 20 years, research on CF has gradually presented a systematic and diverse trend, which has mainly been applied in the field of language acquisition. With the deepening of research on CF at home and abroad, different categories and paradigms have formed in this field. The CF itself has also produced relatively stable categories, forms, and content units. Beginning with the functional definition of *feedback*, the primary concept was established to study the positive effects of the principle developed by Black and Wiliam [1]. However, there are useless positive and negative feedback effects in practice [2], and different feedback has a different impact on results [3]; therefore, the effect of feedback depends on the content used by the researchers and teachers.

A meta-analysis describes the effective coefficient of research based on the content, methodology, and outcomes of related studies. It is a quantitative summary of empirical research findings by [4]. The entire impacts of feedback and the contents that were not statistically significant can be thoroughly and objectively comprehended through the meta-analysis. To a certain extent, the omissions caused by subjective factors like emotion and memory can be avoided. Currently, the empirical research results of CF are abundant,

involving different problems and objects. The meta-analysis provides a comprehensive insight into the basic status and overall effect of CF research. A previous meta-analysis of CF indicates that this subject deserves a secondary review. Examining the process and results of the meta-analysis of CF provides a more systematic reference for judging the effect of CF and its practical application.

2. Consistency and Contradiction of Effect Sizes

Effect size is an indicator of the strength of the relationship between variables and is not affected by sample size [5]. According to Chow [6], the significance of effect size may both reflect the influence of an independent variable and summarize the independent variable's effects on the dependent variable across several studies. The comprehensive effect is expressed by employing the mean value of an effect size in a series of studies [6]. The calculation of effect size is widely used in meta-analysis studies. The effect size can comprehensively represent the degree of effect, which is in line with the main purpose of meta-analysis, that is, to obtain a general conclusion [7]. Generally, two common calculation methods of effect size are Cohen's d value, proposed by Cohen [8], and the effect size of g value by [9]. Both

approaches determine the standard deviation in order to indicate the effect size, although Hedge's g calculation approach is more precise than Cohen's *d*. These calculation techniques are common and typical in small sample meta-analysis research and have little bearing on the result. The calculation formula for Cohen's *d* v, which is used to indicate the effect size in the majority of the meta-analysis studies included in this publication, is as follows:

$$d = \frac{\overline{x}_{\text{Experimental Group}} - \overline{x}_{\text{Control Group}}}{S_{\text{Control Group}}}. \tag{1}$$

Information learned varies according to the calculation method. Cohen's *d* offers the average difference between the experimental group and the control group; it is expressed as the ratio of the standard deviation. The effect size of the meta-analysis is related to the difference in effect size between the experimental group and the control group. The first is not a pretest for the average difference between the experimental group and the control group; the second test is checked before and after the test report at the same time. The mean variance in score between the experimental group and the control group is separately assessed for each group.

Many empirical studies of CF use control groups, different correct types, or target differences, CF types, content, length, contexts, locations, test types, and research methodologies as regulating variables (particularly in the effect of analyzing the different types of CF such as subgroup analysis). The premise is that there is heterogeneity in the effect size of these variables, that is, there are differences in the real effects in the included studies, which are expressed as the dispersion degrees of the effect size. The existence of such heterogeneity enables other mediating variables to be included as subgroups in the coding system of the meta-analysis and provides the effect size of the CF in different types and contexts while obtaining the overall effect.

Internal inspection reveals a strong relationship between CF's component structure and its own functions, which may be considered to support and complement each other. A meta-analysis study of earlier CF found that the effect of CF is significant ($d = 0.64, 0.90$). In other words, giving CF to grammar learners has a beneficial impact.

The calculation results directly indicate that CF can promote language-learning results. However, the process of meta-analysis research involves building a compliant component structure to support the construction of a coding system. Coding is the key step of the whole analysis. The compilation of a coding system determines whether the research questions of the meta-analysis can be reasonably answered. Through the analysis of independent variables and other conditional characteristics, the variables in experimental research can be logically and systematically deconstructed to form the coding system in the meta-analysis. The class variables of CF are all included in the coding system of the current meta-analysis, and the clear and standardized coding structure of the meta-analysis provides one of the conditions for the horizontal comparison of the secondary review.

Different types of CF effects are generally discussed in the meta-analysis, and different meta-analyses adopt different classification indicators according to different criteria. In previous studies, scholars have comprehensively sorted the CF categories and have explained the relationships among different categories. The CF can be divided into direct corrective and indirect CF in terms of content, oral and written feedback in terms of form, and immediate and delayed feedback in terms of timing. Different criteria and environmental requirements apply to different types of feedback. For example, written feedback is usually aimed at students' mistakes in written texts; this is more often delayed feedback [10]. The 28 feedback types initially proposed by Chaudron [11] were integrated into six feedback types by Lyster and Ranta [12] later. The five meta-analyses involved in this paper mainly reflect the following types of CF, namely, direct and indirect, implicit, and explicit, and more specific classifications, such as recast and metalinguistic feedback. It should be noted that recasting and other specific classifications are partially subordinate to direct and indirect classifications. Generally, recast and explicit correction are regarded as feedback that provides answers directly, which is consistent with direct CF in form and function. However, repetition, elicitation, clarification, and metalinguistic feedback require the student to further process a mistake. They are collectively called *prompt feedback* and are consistent with indirect feedback in construct. Therefore, a stable and systematic category structure has not yet been formed in the research on CF, and different meta-analyses have adopted different classification standards for subgroup analyses. However, there is endogenous consistency in defining the types of CF, which also provides conditions for the comparison between categorical variables in this paper. Research suggests that the scope and type of feedback may have different effects on individual learners [13]. In other words, different types of CF have different effect sizes. The effects of different types of CF are systematically displayed through subgroup analysis in meta-analysis studies. The feedback categories and effect sizes in the five meta-analyses are extracted and reported in Table 1 and are arranged according to the effect sizes from up to low.

In the five aforementioned meta-analyses of CF, written, oral, and comprehensive CF are involved. Kang and Han [16] conducted a meta-analysis of 22 studies and found that written CF has an effect on improving the accuracy of second-language writing. Li and Sun [18] conducted a meta-analysis of 18 original domestic studies and reported that the effect size of written CF reached a significant level. In the study by Wang et al. [17], the results of 21 English studies were included in the meta-analysis, and the results of written CF with high-effect size were also obtained. Brown [15] conducted a meta-analysis of 28 articles to explore the effect of oral CF on improving writing accuracy and includes a further discussion of the influence of various moderating variables on the effect. Li [14] examined 33 studies on oral and written CF and conducted a subgroup analysis of oral and written CF as a group of mediating variables, finding the overall effect of CF to be at a mid-range level. Each of these five studies included subgroup analysis with the type of CF as

TABLE 1: Effect sizes of different types of CF in meta-analysis.

CF type [14]	Interval	d	CF type [15]	d	CF type [16]	G	CF type [17]	d	CF type [18]	Lower effect size / Upper effect size
Recasts	Short	0.435					Recasts	0.852	Implicit feedback	0.46
Explicit feedback	Long	0.440	Metalinguistic	0.079			Explicit correction	0.930		
Implicit feedback	Short	0.446								
Recasts	Immediate	0.480	Clarification	0.094			Metalinguistic	0.976		
Metalin-gstic	Short	0.519							Metalinguistic	0.67
Implicit feedback	Long	0.544					Clarification	1.049		
Clarification	Long	0.547	Explicit correction	0.097	Indirect	0.361				
Recasts	Long	0.553					Direct Category 2: 0.922		Mixed feedback	0.97
Implicit feedback	Immediate	0.562	Elicitation	0.116						
Metalingui-stic	Immediate	0.581								
Explicit feedback	Short	0.622	Repetition	0.130	Direct	0.598	Indirect Category 1: 1.049		Explicit feedback	0.97
Explicit feedback	Immediate	0.718								
Explicit correction	Immediate	0.908	Recast	0.570						1.17

a group of variables. In addition to Kang and Han's studies, other meta-analysis calculation methods use Cohen's d to express effect size, while Hedge's g used by Kang and Han expresses the effect size by calculating the standard mean difference, which supplements and corrects Cohen's d by using a correction factor. In the longitudinal comparison, the difference between the two does not affect the analysis result.

Specific horizontal comparison between effect sizes is difficult to achieve because different meta-analyses generally have different data sources, research questions, paper inclusion scopes, and coding logic; furthermore, longitudinal comparison in categories is a common operation in meta-analysis.

These studies report the high responses to explicit and direct CF, and the low effect of implicit and indirect CF. However, Wang et al. [17] present the low effect of direct feedback and have an efficient response to indirect feedback. The contradiction between high- and low-effect sizes mainly exists between direct and indirect, and explicit and implicit categories. Such conflicting research results are not accidental, and there has long been a considerable controversy about the effect of CF in academic circles [19–21]. As a group of variables in subgroup analysis, different types of CF produce different effect sizes, which needs further exploration.

3. The Reasons for the Consistencies and Inconsistencies in the Meta-Analysis

Consistent and contradictory results between different types of CF effect sizes are common in experimental studies. However, in a comprehensive meta-analysis, this situation should receive further investigation. It should be emphasized that the quantitative value indicating the influence of research processing and the comprehensive effect of CF is the meta-analysis of the CF. The statistical significance, however, should not exceed the practical significance. The definition of effect size in statistics is the extent to which there are variations in the population mean under various treatment strategies. It is not impacted by sample size and may be compared across research. In the empirical research on CF, different studies adopt different measurement tools and methods integrating these elements into systematic reports. The measurement of effect size is needed to overall evaluate the effect differences and CF influencing factors. Generally, the calculation of the standard difference quotient and the effect of the correlation coefficient are often used to report the component analysis research of CF in two aspects by analyzing the meta-analysis. If the amount effect is more significant, then it can represent the variable and the conclusion. It additionally indicates that there was a significant correlation between a further indication of the CF and different variables, which resulted in the change. Currently, several meta-analyses on the effect sizes of CF have concluded that CF significantly promotes writing or grammar learning while the effect sizes of different mediating variables produce mixed results. However, the effects of high and low levels of CF generate adaptive adjustments in different fields

of study. For example, in second-language acquisition, CF improves the effectiveness of the second-language writing accuracy. In the first-language acquisition or other studies of CF, both high and low levels of CF cannot be generalized in a meta-analysis. Concurrently, the effect size is restricted by different research fields. Cohen used effect sizes of 0.20, 0.50, and 0.80 as cutoffs to measure the low-, medium-, and high-effect sizes in his separate effect size calculations. However, in their research on second-language acquisition, [22] propose that 0.40, 0.70, and 1.00 are more suitable for the cutoff points of low-, medium- and high-effect size. Consequently, some factors may affect the component analysis result, as the cause of the meta-analysis method may be produced by internal factors including data sources, selection standards of differences, collinearity between variables, and problems with the meta-analysis method itself. This effects the production mechanism and the differences in students' individual factors. A detailed analysis is given in the next portion of this article.

3.1. Differences in Literature Sources and Screening Criteria. The source and selection criteria of the literature in a meta-analysis influence the results. At present, the meta-analysis of CF mainly focuses on oral or written CF effects, written CF effects, and comprehensive CF effects. The main effect is reflected by the accuracy rate or error rate. Different meta-analyses include different literature collection indicators, such as literature source, literature selection, literature language, and literature publication date. These indicators receive attention in this meta-analysis to avoid the interference of literature selection in the conclusion as much as possible.

Collating the aforementioned five meta-analysis papers revealed that, with the exception of Li and Sun's studies, the literature source for the other four meta-analyses was a Chinese database and the literature included in the meta-analysis was mainly from academic journals, postgraduate and doctoral papers, and some unpublished research papers. It should be noted that not all meta-analyses consider unpublished papers resulting in "insignificant" results that are ignored by authors and journals. Concurrently, the problem of publication bias—if a new study comes to the same conclusion as a previous study, then the newer study is more easily published—may also be another factor. When this happens, many studies that are consistent with previous conclusions may be superfluous and inconsistent results may be novel (Leandro, 2005). Since the five meta-analyses herein passed the test of publication bias, the conclusion is that publication bias was not apparent. However, it is not practical to completely avoid the influence of publication bias in this meta-analysis. The next section presents how to address in detail the issue of publication bias in the meta-analysis, which is not described here.

The basic indicators for the screening of the above meta-analysis mainly include the following: the study has CF as one of the independent variables, the study is experimental or quasi-experimental, the study has a control group and an

experimental group, the study presents the result of the effect test on the dependent variable, and the study offers enough information to calculate the effect size. To better explain the research problem, different meta-analyses require some adjustments. It shows that whether the influence of feedback can be separated from other influence variables. Li's [14] research uses this point as an index for inclusion. In the meta-analysis study by Kang and Han [16], if the same control group produced two or more groups of effect sizes, then the regulatory variables of feedback type are not included for analysis because the same control group would produce more than one effect size, which violates the assumption of data independence [23]. Therefore, the results of Van Beuningen et al. (2008) are not included in the calculation of the average effect size of the feedback type. Different studies included in the meta-analysis lead to different conclusions. In particular, the meta-analyses by Kang and Han [16]; Li and Sun [18]; and Wang et al.'s [17] studies have differences in data screening, such as publish time and the text language of the paper. However, in Kang and Han's [16] and Wang et al.'s [17] meta-analyses, only one identical study was included in the analyses, which may be the source of the contradiction between effect sizes in these studies.

3.2. Collinearity between Variables. A meta-analysis allows the synthesis of results from multiple studies. It is not a simple sum of data from all studies in the field but a process of weighting each result according to the needs indicated by the research question. With different applications or research questions, the students, learning contents, and other factors impact different types of CF. Although the types of CF belong to a subgroup, the variable affecting the outcome of feedback is not purely a causal relationship in the subgroup (different feedback categories). If the students are affected by individual differences, learning contents, and other subgroup factors in an experimental process, then the effect of these factors' influence on feedback needs to be further examined. Kang and Han's [16] study presents no statistically significant difference between the effect size of direct and indirect feedback, and the comparative significance of the effect size exists only in longitudinal comparison. One possible reason is that the type of feedback variable may work in concert with other factors rather than acting alone to illustrate the effect of written CF. For listening, speaking, reading, and writing, the direct and indirect feedback effects are different. The magnitude of the effect of different types of CF in different circumstances is included in the study of other parallel subgroups. The study by Li regards whether the effects of CF can be independent of other variables. However, many meta-analyses do not consider whether the effect of feedback can be separated from other influencing variables. Thus, examining the subgroups of different types of CF variables, researchers must consider other variables that may influence collinearity, the individual's influence on the study, or the effect of different types of CF instability. These are one of the problems faced by experimental research or quasi-experimental research.

3.3. Influence Caused by Students' Individual Factors. Viewed from the outside, the types of CF, as a means of regulating behavior throughout the learning process, have certain commonalities. Most studies on CF show a process that starts with oral or written feedback. In this process, learners participate in error correction under the influence of their individual differences and contexts and produce learning results, as shown in Figure 1. The effects of CF are mediated mainly by two elements: one is individual difference factors; the other is contextual factors.

Based on this framework, five mediating variables were determined that impact the overall effect in the CF meta-analysis as presented in Table 2.

Theoretically, the variables that influence the effect are infinite. With the deepening of the research on CF, understanding has begun to dynamically change, and the variables that influence the effect size continue to accumulate. According to the description of previous studies in the current meta-analysis, most of those studies focus on the influencing variables of CF itself or the differences caused by context. They additionally explore the relationship between CF strategies and learning results. The presentation of the existing variables provides teachers and students with controllable conditions or guidance in learning. But there are still many key variables that are not included in the scope of experimental research, such as those related to individual differences. According to a meta-analysis' coding system, most analyses focus on the feedback itself, the content of the dominant category, the background variables, the implicit motivation, and the emotional and behavioral variables. These variables that stratify the student body are measurable and are also important. However, few meta-analyses incorporate this variable into the coding system.

From the perspective of learners, individual differences are inevitable. In receiving feedback, students encounter differences in learning abilities and other factors. The feedback itself cannot directly affect students' learning, but it needs to be coordinated with the learning environment and self-regulation of students [25]. Students' ages, language abilities, memory capabilities, learning styles, personalities, motivations, language anxieties, and beliefs have a lasting influence on their learning processes. These factors are also applicable to the effect of CF. In the process of receiving CF, these variables interact with each other and play a significant regulatory role in the reception of CF, influencing the development of learning outcomes and learning abilities. Emotions and motivations significantly impact learners. In the component analysis of this overall discussion, motivation is not one of the significant indicators. From the perspective of learners, when accepting feedback, the participation of different kinds of emotions and motivations is different. These emotions and motivations are transferred to the cognitive degree of positive correlation. When students transfer their cognition and behavior, they need more power, that is, more motivational and emotional engagement. In particular, direct CF clearly improves the learning outcome on the basis of direct error correction and is weak in mobilizing students' active participation. Although this result ensures the effectiveness of feedback, it is actually
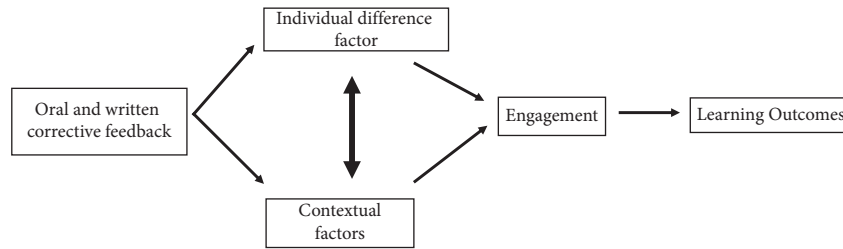
Individual difference factor

Oral and written corrective feedback

Engagement

Learning Outcomes

Contextual factors

Figure 1: A component framework for investigating CF [24].

Table 2: Other mediating variables in the meta-analysis.

[14]	[18]	[15]	[17]	[16]
1. Outcome measure	1. Education level	1. Target language	1. Language environment	1. Second-language proficiency
2. Timing of post-tests	2. Focus of feedback	2. Educational level	2. Academic situation	2. Scope of feedback
3. Learners' proficiency levels	3. Range of feedback	3. Instruction type	3. Range of feedback	3. Genre of writing task
4. Measures of proficiency	4. Source of feedback	4. Reliability measure	4. Medium of feedback	4. Interval
5. Task type	5. Amount of feedback	5. Reliability measure type		5. Type of research
6. Learners' age		6. Reliability estimate		6. Target language
7. Learners' first language	6. Focus of measuring tool	7. Immersion	5. Feedback timing	
8. Learners' second language		8. Participants' first language		7. Outcome measure
		9. Proficiency level		

Note. This table only retains the internal factors of CF and excludes the following variables that have been previously discussed: the content of feedback type, research background, publication type, publication year, and so on.

achieved by reducing the complexity of students' error correction. The effect in the meta-analysis is the experimental effect under the systematic calculation. Although a variety of meaningless variables are excluded, the specific effect size produces inconsistent situations, which may be related to the students' motivation factors. Preliminary studies have found that students' emotions, motivations, and language-learning anxieties are significantly related to each other [21]; however, the deeper aspects of learners such as learning style and motivation have not been adequately studied in much of the CF research. The present meta-analysis also does not systematically include such intermediary variables.

3.4. Effect-Generation Modes of Different Types of CF.

The authors believe that the evaluation methods and indicators of the effects of CF (dependent variables) impact the experimental results of CF. Compared with other kinds of feedback (such as content feedback), CF presupposes that there is a correct answer and the distance between student performance and this correct answer is necessary. Therefore, based on the opposite relationship between wrong and right. The conflict between result orientation and process orientation is inevitable if the opposing connection between wrong and right is prioritized above learning development. In the overall feedback concept, the function of feedback is to change students' attention and motivations, whereas CF guides the student to confirm, rewrite, change, or reconstruct the memory of information whether this information is domain knowledge, cognitive strategies, or learning

strategies. Metacognitive knowledge exists to clarify misunderstandings and enable students to understand their own knowledge and skills gap with the target. Therefore, CF has a strong purpose even if the specific goals are not used in the content of the feedback. The goals, from beginning to end, are implicit in every part of the feedback. They are regardless of any type of CF with different dominant or recessive goals and cause the learner to be motivated to accept the feedback.

In the meta-analysis involved in this paper, the effect size is primarily represented by the measurement of grammatical accuracy. The results obtained by post-testing are usually reported in students' error rates and accuracy rates. The accuracy rate displayed by students in post-testing is a direct indicator of the effect. After receiving feedback, learners used to monitor, regulate, and control their cognition, motivation, and actions to achieve these goals. Understanding the content of the feedback process is the key to determine the effect size. Once students have resolved the difficulties of the cognitive process, they accept the CF. A quicker understanding of the learning effect is also evident in the prompt direct correction. These are all based on reducing the cognitive process of CF. On a cognitive level, it is a way to close the distance between wrong and right or the student's current understanding and the end goal. The acceptance of feedback lies in behavior. It involves the way to receive feedback after the cognitive process is over. In the meta-analysis, the calculation result of effect size is also a manifestation of behavioral results or the presentation of experimental results. The effect size in meta-analysis is a statistical expression of experimental results. Admittedly, this is a requirement of meta-analysis as a statistical method

and it also reflects that the discussion of categorical systems throughout CF research is less concerned with long-term learning outcomes. There are two types of feedback that students want. First, students want to be told what they did wrong, why they did it wrong, and how they could do it better (where the *why* needs further explanation from the teacher). The second type of feedback students desire is tips or noteworthy points for their future study and general advice about their future study [26]. In fact, the contents of the two kinds of feedback are consistent with the analysis herein. The former corresponds to direct and timely feedback and advances certain explanations. Direct error correction achieves high CF benefits. The indirect and guided feedback is more responsive to the needs of the latter. It is hoped that teachers can provide space for certain self-operations and do not strongly respond to the relatively simple direct error correction. As Truscott [27] argues, CF may only help improve the grammatical accuracy of subsequent existing learning outcomes but not of a new learning task.

4. Research Prospects of CF Meta-Analysis

Based on the above analysis, the effects of CF produce the phenomenon of coexistence of consistency and differences in meta-analysis. The reasons for these phenomena are closely related to the meta-analysis method and the characteristics of CF. Mathematically, the effect size of a meta-analysis represents the degree of correlation between factors and effects, but academically, CF may not have a lasting, positive stimulating effect on the improvement of students' learning abilities. The effect size of a meta-analysis is not the end of the conclusion. The specific content and formation process of the effects of CF in the meta-analysis, therefore, need to be further clarified to provide some reference for future studies in CF. Four clarification aspects are as follows.

4.1. Properly Treat Bias. Publication bias, result-reporting bias, and coder bias generally influence the conclusions of meta-analysis. The validity and robustness of the results of meta-analysis depend on the degree to which bias influences the research. Publication bias can indicate the extent to which existing studies are not representative of all studies, typically with an overestimation of the actual effect size [28]. Publication bias is typically caused by three factors: editors and journal reviewers, the researchers themselves, and gray literature. Researchers tend to pay more attention to the first factor and ignore the researchers and the gray literature. In some areas, the researcher's decisions may be the main cause of publication bias. In this way, the author controls the data and thus has the largest influence before the paper is submitted. The author must review and research the data, noting small sample sizes, a lack of significant statistical results, and previous general conclusions that are inconsistent or contrary to the author's position. The author may choose not to submit these findings to journals or conferences. Additionally, the gray literature exists but may be difficult for researchers in both channels as the language differences and obtaining timely translations are the key causes for overlooking gray literature. Accordingly, CF is a trend in English literature for the present meta-analysis, although literature in Chinese or other less-frequent languages is often neglected. A more intuitive bias formation process is presented in Figure 2.

In view of the above reasons, this study proposes three strategies for addressing publication bias in meta-analysis.

First, multivariate methods should be used to assess publication bias. Publication bias assessment is a sensitivity analysis comprising multiple bias tests and improvement methods. In the component analysis of CF, the more mainstream way of assessment is by creating a funnel plot for a publication bias test. The size of the direct influence is shown by the funnel chart's standard error of the reciprocal. A small sampling error and features of high-precision accuracy are shown at the top of the funnel graph in the examination of a large sample size, together with the impacts of the nearly average value. Conversely, studies with small samples and low accuracy appear at the bottom. If publication bias is not clear, then all literature are symmetrically distributed around the median line. In case of significant heterogeneity, if a sufficient number of studies can clearly extract data from subgroups, then researchers should conduct publication bias analyses within subgroups to evaluate the degree of bias from different subgroups. It is conducive to more comprehensive demonstrations of the interpretation of the overall effect of CF.

Funnel plots can only answer the question of whether bias exists, but addressing bias depends on the Klein formula. Klein's approach is based on the following assumption: if unpublished studies share the same characteristics as published studies, such as a number of subjects and their variability, then how many unpublished studies with negative or invalid results are needed to influence the conclusions of the meta-analysis (Leandro, 2005)? Klein's formula can be used to evaluate the reliability of a meta-analysis in specific quantities. The formula is as follows:

$$\left(\frac{k\mathrm{Ln}OR}{1.96}\right)^2 \overline{W} - k. \tag{2}$$

Regression lines with odds ratios (*y*-axis) and accuracy estimates (*x*-axis) can be fitted for each research once the odds ratios of normalized logarithms and standardized estimates of accuracy are known. If publication bias is absent, then the *y*-intercept is 0. Publication bias is statistically acceptable if the 95% confidence interval of the data sample in the meta-analysis crosses the zero line. Conversely, if the 95% of confidence interval does not cross the zero line, then there is a publication bias.

This is a brief introduction to the first method to test and adjust publication bias. Meta-analysis emphasizes stable and reliable conclusions. On the premise that publication bias determines the reliability of conclusions, meta-analysis may adopt multiangle methods.

The second strategy for addressing publication bias is to clearly and adequately report the data in the meta-analysis. Clear and full reporting of the literature search process and the literature data summary is a necessary measure to ensure
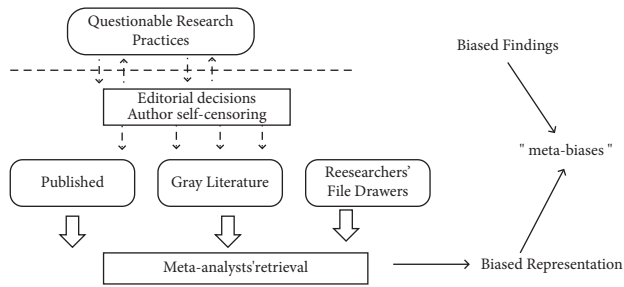
Figure 2: Research and publication processes that contribute to biases in meta-analytic findings [29].

the transparency of the meta-analysis. Data information is reported in the meta-analysis so that other researchers can evaluate the meta-analysis and reanalyze it. For the researcher to assess the comprehensiveness of the search, the author should describe the search strategy and process in detail. Unpublished literature should be adequately reported in the analysis to ensure that its study is suitable for use as a meta-analysis. In CF, further attention should focus on allowing researchers to obtain the complete database in meta-analysis especially for data materials in different language backgrounds, which should be properly classified and translated [29].

Third, researchers should establish a research record database in related fields to collect the articles that have been studied but have not been published and are not planned for publication to maximize the data source of the meta-analysis. This measure is primarily preventive and can reduce the negative impact of publication bias on meta-analysis by establishing an open research record database. This work has been performed in psychology and other fields [30] and may be worthy of reference in linguistics and education. Generally, the main responsible units for the establishment of this database are the more authoritative research institutions or competent departments in the field to ensure the effective and stable operation of the database.

4.2. Focus on Learner Variables That Influence CF Effects.
In experimental studies, the effects of different variables are different regardless of the stage performance of post-testing scores or the stability performance of learning ability development. The variables in the meta-analysis are classified in subgroup analyses based on variables reported in literature data. The CF and branch factors are typically used as independent variables to evaluate students' learning effects. However, students as the subjects of learning should also heed the student's influence on the feedback effect. According to the arrangement of this paper, little attention is paid to individual students in the current meta-analysis. This means that experimental studies of CF seldom pay attention to individual variables such as the impact on the feedback effect that originates in learners' learning styles, motivation, and knowledge, which may cause significant changes to the feedback effect. Incorporating student-specific variables into the CF effect experiment may provide useful context. The feedback effect may be strongly impacted by individual

student factors. Therefore, it is challenging to determine the true impact of CF if the impact on the feedback effect cannot be isolated from individual student factors. As a result, it is challenging to demonstrate a genuine causal relationship between variables. In the process of meta-analysis, attention should be paid to the influence of this variable on the comprehensive effect and the relationship between variables should be clarified in the process of literature data coding.

4.3. Summarize the Measurement Methods of the CF Effect.
According to the meta-analysis literature data, the method of measuring the effect of CF is primarily based on students' accuracy rates after finishing the post-test. In specific measurement methods, the accuracy rate of grammar and vocabulary use is employed to judge the effect on learners who received CF. Materials are usually written by learners on a certain topic, but due to the diversity of research questions, they may also be written as oral records, paper-and-pen questions, or answers. In the literature data of a meta-analysis, the forms and means of measuring and evaluating CF are diverse and there is no unified standard. Although all studies cannot be required to offer measurements based on similar criteria, the effects of different measurements and procedures can be flagged by further subgroup analyses or literature data screening during the meta-analysis. For example, researchers can determine whether there is a test delay effect, a test for stable learning ability, or a test to measure the effect of different test intervals, among others. Additionally, the effect size in the current meta-analysis cannot represent the lasting effect of promoting the development of students' learning abilities. The effect measurement of CF is not the complete measurement of learning ability development. Although it can explain part of the results of learning ability development, it is difficult to fully represent the subjects' internal causes and motivations in the development process and the effect on their entire learning abilities. While advocating diversified feedback, it is necessary to improve the development of students' literacy while cultivating lasting learning and reflecting abilities. Instead of focusing solely on the right and wrong answers, some CF with low-effect sizes can improve students' awareness of error correction and learning motivation in practical teaching. The research on CF may further explore its utility in the development of students' learning abilities. In particular, researchers should examine whether CF can enable students to improve their abilities to solve complex problems under the requirements of improving learning literacy.

5. Conclusions

The continuing CF debate and component analyses in the results reporting have certain quantitative conclusions because the effect of the amount of judgment is subjective in different fields of study. As observed, the consensus may reflect the general expectation that meta-analysis can provide a comprehensive summary of a research topic. However, attention should also be paid to the inconsistency in the meta-analysis, which includes the uncertainty of the meta-

analysis method itself and the theoretical reasons for the difference in CF's class effects. By re-examining CF meta-analysis, this paper argues that science is essentially a process of accumulation and that no meta-analysis has enough power to end the current debate in a research field, when meta-analysis seeks multiple conclusions and provides improved references for future research [31–33].

Data Availability

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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