

# **A Review of the Study Methods of the First Language Transfer to Second Language Writing and Their Result**

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## **Abstract**

Some researchers proposed writers will transfer writing ability and strategies from their first language (L1) to second language (L2) and benefit from such transfers. However, some other researchers found negative effects of such transfers on learning L2 writing, and some even argue that little transfer exists. The discrepancies might originate from the different methodology applied to studying the effects of transfer, and so a review of the literature was conducted to identify the methods applied in the previous studies and compare the results. Accordingly, three common approaches were identified: thinking aloud, analysis of writing pieces, and questionnaire survey. There were some variations in applying the same approach. For example, among the studies using the thinking aloud approach, some studied the process of L2 writing alone, some studied both L1 and L2 writing from each participant on different topics, and some studied writing pieces in both L1 and L2 from each participant on the same topic. Eight studies found only positive effects of transfer, four found both positive and negative effects of transfer, and one of the studies found little transfer. In particular, in studies found both positive and negative effects of transfer, positive effects were observed in lower-level writers, and negative effects were observed in higher-level writers, indicating a "threshold" of the positive effects of L1 transfer on

L2 writing. These features have implications on instructions of L2 writing:  
instructions on L2 writing to adult learners should adopt different strategies at  
different stages.

## **Introduction**

To keep abreast of the rapidly growing globalization, more and more people have the opportunity and need to write in a second language (L2). It is generally believed that when attempting to communicate in L2, literacy skills in the first language (L1) can be transferred to the L2, including the writing ability. The transfer across languages becomes an important concept either for linguists or for bilingual researchers to probe the correlation between two languages. Whereas such a transfer seems inevitable and beneficial to the development of L2 writing, the L1 ability may not be entirely transferable across languages, and some of the transferred skills may in fact introduce interferences to the development of L2 writing. Therefore, identifying the positive and negative effects of L1 transfer on the development of L2 writing may help writers build up their L2 writing skills more efficiently. Such knowledge can also facilitate the instruction of L2 writing. Furthermore, by studying the transfer in the context of a writing process model may help better understand the acquisition of writing skills.

There are different methods to study the effects of L1 transfer on L2 writing, and each method has its strengths and limitations. In addition, different methods might lead to different conclusion. This study reviewed the current literature on the effects of L1 transfer on L2 writing and categorized the articles according to the methods applied. The strengths and limitations of each method were discussed, and the results from studies using different methods were compared.

## **Materials and Methods**

A search of relevant publications was conducted through computerized databases of journal articles using “L1,” “L2,” “transfer,” and “writing” as key words. Further search of literature was conducted by looking through the references of each publication. The review was limited to empirical studies and focused on studies on the effects of L1 transfer on the development of L2 writing, including those on the correlations between the L1 proficiency and L2 writing. Only those that have tried to determine the direction of the effects (positive or negative) were included in the final analysis.

After review of the articles, studies were categorized according to the approach applied to evaluate the effect of L1 transfer. Findings of studies were synthesized for each category of study. After that, the methodologies adopted by the studies were discussed with reference to other literature.

## **Results**

### ***Research Methodologies***

A total of 14 studies were identified, and the methods used in this body of research selected for examining fall into three approaches: analysis of writing pieces, thinking aloud, and questionnaire survey. The studies using more than one approach are categorized as multiple-dimension approach.

### **Analysis of writing pieces**

In order to test the relationship of L1 and L2 writing skills, the most direct and convenient way is to ask the participants to write. By contrasting the same learners writing comparable tasks in their L1 and L2, studies can make inferences about whether the transfer occurs while composing. Therefore, writing pieces collected from the writers' compositions are often used as the preliminary data. Eight of the studies reviewed applied this method (Edelsky, 1982; Jones & Tetroe, 1987; Uzawa & Cumming, 1989; Friedlander, 1990; Carson & Kuehn, 1992; Kobayashi & Rinnert, 1992; Cohen & Brooks-Carson, 2001; McCarthey et al., 2005), making it the most frequently applied method. It is also the method that applied earliest to study this topic. Edelsky (1982) proposed hypotheses including local hypotheses regarding spelling, to more global hypotheses regarding differential constraints, to abstract processes for producing texts. Writing pieces in both L1 (Spanish) and L2 (English) on different topics from nine first to third graders with L2 proficiency at the beginner level were analyzed. While the data found evidence of L1 application, including general strategies, higher-level knowledge and the crucial process of orchestration, to L2 writing, it only revealed surface consistencies or inconsistencies of L1/L2 interaction during the writing process.

Six of the eight studies were on English learners, including Chinese as the L1 in three (Friedlander, 1990; Carson and Kuehn, 1992; McCarthey et al., 2005), Spanish as the L1 in two (Edelsky, 1982; Jones and Tetroe, 1987), and Japanese as the L1 in one (Uzawa & Cumming, 1989). The participants had L2 proficiency ranged from the beginner to low advanced level, and the number of participants ranged from 5 to 48 in a single study. All except one of the studies analyzed both L1 and L2 writing pieces from the same learner, including two on the same topic. Friedlander (1990) analyzed the plan and final work of L2 (English) writing, instead of writing pieces in L1 and L2, from 28 Chinese adults whose L2 proficiency was not specified. Both match (planning in the language of topic knowledge; L1) and mismatch (planning in the

language not related to topic knowledge; L2) scenarios were studied, and a positive transfer of knowledge of the topic was observed.

Seven of the eight studies observed positive transfers (effects) from L1 to L2 writing, including three also observed negative transfers (Carson & Kuehn, 1992; Kobayashi & Rinnert, 1992; Cohen & Brooks-Carson, 2001), but none observed negative transfers only. Both positive and negative transfers were observed in the whole process of writing.

Two of the studies also analyzed L2 writing pieces that were translated from L1 by the writers (Kobayashi & Rinnert, 1992; Cohen & Brooks-Carson, 2001), one on the same topic (prompts) (Cohen & Brooks-Carson, 2001), and the other on different topics (Kobayashi & Rinnert, 1992). Both of them observed both positive and negative transfers.

### Thinking aloud

Since Hayes and Flower's seminal model (1980) of composing portrayed writing process as a cognitive process, there was a growing interest in exploring the cognitive process than the composing products. Research investigating the cognitive processes involving in composing in L2 emphasizes the recursive nature of L2 writing (Friedlander, 1990; Raimes, 1985; Zamel, 1982, 1983). Cognitively-oriented studies aim to examine learners' ongoing thinking episodes or decision-making while composing. Think-aloud protocol has therefore been often used as a powerful tool to identify how materials are retrieved, edited and encoded into the written forms, which demonstrates the dynamic nature of the entire writing process in which several elements and subprocesses interact with one another. Seven of the studies reviewed applied this method (Lay, 1982; Jones & Tetroe, 1987; Uzawa & Cumming, 1989; Cumming, 1989; Cumming, 1990; Woodall, 2002; Wang & Wen, 2003), including one (Cumming, 1990) that re-analyzed the data from a previous study (Cumming, 1989).

Six of the seven studies were on English learners, including one also covered Japanese and Spanish learners, and the last one was on Japanese learners (Uzawa & Cumming, 1989). One of the studies included three languages as L1 and three languages as L2 (Woodall, 2002). A total of four languages were studied as L1--Chinese, Spanish, French, and Japanese, and each was covered by two studies. The participants had L2 proficiency ranged from the beginner to advanced level, and the number of participants ranged from 4 to 28 in a single study. Only two of the

studies analyzed both L1 and L2 writing processes from the same learner, one on the same topic (Uzawa & Cumming, 1989), and the other on different topics (Jones & Tetroe, 1987). The majority of the studies (five of the seven) studied L2 writing process only, including two using the same prompts.

Five of the seven studies found only positive transfers from L1 to L2 writing (Lay, 1982; Jones & Tetroe, 1987; Uzawa & Cumming, 1989; Cumming, 1990; Wang & Wen, 2003), which occurred in the whole process of writing. Woodall (2002), who studied three languages, found positive effects on cognate L2, negative effects on non-cognate L2. Whereas a positive correlation between L1 and L2 expertise in the planning of writing was observed in a study of 23 French-speaking adults with intermediate to advanced English (L2) proficiency, the author did not believe there were transfers between the two (Cumming, 1989). However, in re-analysis of data from this study, the author found the L2 writers “appeared to be integrating their linguistic knowledge in their mother tongue with their knowledge of the second language,” implying a transfer of linguistic knowledge from L1 to L2 (Cumming, 1990, p. 494). Furthermore, the back translation approach applied by the study participants in problem solving was interpreted “*strategic transfer*” (Faerch & Kasper, 1987).

### Questionnaire survey

Three of the studies reviewed applied this method (Uzawa & Cumming, 1989; Cohen and Brooks-Carson, 2001; Wang, 2003). In the studies, questionnaires were used to elicit learners’ retrospective language behavior during the writing process (Uzawa & Cumming, 1989; Wang, 2003) or self-perceived L 2 writing strategies (Uzawa & Cumming, 1989; Cohen and Brooks-Carson, 2001). In addition, questionnaires were used to collect demographic information on the students such as age, gender, and educational background as well as the students’ language background information and self-evaluation of the level of L1 and L2 proficiency (Cohen and Brooks-Carson, 2001; Wang, 2003).

The studies using questionnaires involve participants ranging from 8 (Wang, 2003) to thirty-nine (Cohen and Brooks-Carson, 2001). Two of the studies focused on participants with intermediate L2 proficiency (Uzawa & Cumming, 1989; Cohen and Brooks-Carson, 2001), and one included both participants with low and high L2 proficiency. Wang (2003) uses two sets of questionnaires: prewriting questionnaire, to identify the participants appropriately and post-writing questionnaire, to illustrate participants’ language-switching behaviors. Cohen and Brooks-Carson (2001)

constructs writing strategies checklist survey containing direct writing mode and translated writing mode, along with open-ended comments sheet collecting feedback of the students.

All three of the studies observed positive transfers (effects) from L1 to L2 writing, including one also observed negative transfers and no transfer at all in some participants (Cohen & Brooks-Carson, 2001).

All three of the studies analyzed L2 writing pieces, and observed positive transfers. Two of the studies paired questionnaires with think-aloud protocol (Uzawa & Cumming, 1989; Wang, 2003), and the other study collected the participants' retrospective verbal report (Cohen and Brooks-Carson, 2001) regarding the extent to which they made use of the various strategies while composing.

### Multiple-dimension approach

Four of the studies reviewed above applied more than one method (Jones and Tetroe, 1987; Uzawa & Cumming, 1989; Cohen & Brooks-Carson, 2001; Wang, 2003). In fact, except for the study by Jones and Tetroe (1987), each study used three approaches. By using multiple measures in one single study, the researchers expanded their attention to multiple issues such as L1 writing strategies transfer in L2 composing or the impact of L2 proficiency on the quality of composing.

Uzawa and Cumming (1989) sought to explore students' composing behaviors and writing strategies in their composing processes in L1 and L2. Cohen & Brooks-Carson (2001) explored the issue of nonnative writers attempting to think directly through L2 while composing and investigated whether thinking through L1 may actually enhance the production of good writing in L2. Wang (2003) intended to investigate the concurrent switch between L1 and L2 and the role of L2 proficiency played in the quality of L2 composition. As the study of L2 writing is multifaceted in nature and the dimensions involved cannot be treated separately, the use of such integral approaches can help obtain a more optimal outcome.

## **Discussion**

### ***Correlations between L1 and L2 writing ability***

Early in the 1960s, there were findings suggesting a positive effect of transfer between two languages for bilingual children (Pearl and Lambert, 1962). In the 1970s, some scholars provided theories to support the positive effects of L1 on the

development of L2 writing skills. For example, Cummins (1979) proposed the “developmental interdependence hypothesis” positing that the development of L2 skills of a child is a function of the child’s level of L1 competence at the time when intensive exposure to L2 begins. That is to say, the level of L2 writing ability a bilingual child can attain is a function of the L1 writing ability that child has developed initially.

The theory of interdependence between L1 and L2 is further endorsed by many studies (Edelsky, 1982; Wong, 1993; Francis, 1999). Wong (1993) conducted quantitative and qualitative research examining performance in writing both English and Chinese by students in Singapore and found that L2 writers appeared to make use of a common underlying proficiency (L1) when they wrote in two languages despite the different orthographies of English and Chinese languages. Francis (1999) conducted a study in Central Mexico, a bilingual area of Spanish and Na’huatl and concluded that the great control over inter-linguistic lexical transfer reflects a general ability to avoid interferences of a clearly unbidden variety (e.g. at the orthographical level) and a broader access to higher level meta-textual strategies. These findings of consistent parallels among language proficiency in both the L1 and L2 confirmed once again the interdependence hypothesis of Cummins (1979).

While transfer from L1 to L2 is commonly used as writers’ strategies in the writing process, some research has extended the focus to the associations between transfer and L2 competency. Cumming (1989) studied 23 adult ESL learners but did not observe an association between transfer and L2 competency. Kobayashi and Rinnert (1992) conducted a study of English compositions written by 48 Japanese students to identify the differences resulting from two writing processes, one in Japanese first then translated into English and the other in English directly, and the relationship between these two writing processes and students’ language proficiency. While they found an overall positive effect of translation on syntactic complexity, positive effects on quality of content, organization, and style were only observed in lower-level writers, and higher-level writer even made more errors that interfered with intended meaning in translation. If the intended translation can be regarded as a way of L1 transfer as “switches” in Lay’s study (Lay, 1982), this study implied that L1 transfer can only benefit the L2 writing of students below a threshold level of proficiency in L2. The study had a relatively large number of participants and checked the inter-rater reliability on more subjective measurements. Through a different approach, Wang (2003) investigated quality issue with a study on eight Chinese-speaking ESL learners with different levels of English proficiency in performing writing tasks and found that

all participants switched language frequently and to about the same extent while composing in the L2, in order to compensate for their L2 deficiencies. Carrying out their writing tasks this way might have helped them overcome writing difficulties without exerting much mental efforts. More specifically, writers with higher L2 proficiency benefited in rhetorical choice and discourse, and writer with lower L2 proficiency benefited in content generation and text review.

### ***Positive Effects of L1 Transfer***

The relationship between L1 and L2 may be viewed as either “interference,” implying a negative effect, or “application,” implying positive effects (Edelsky, 1982). On the basis of this concept, Edelsky (1982) analyzed writing pieces in both L1 and L2 on different topics to examine the relationship between L1 and L2 writing on nine, nine, and eight students of a Spanish (L1)-English (L2) bilingual program from the first to the third grade respectively and found applications rather than inferences from L1 writing to L2 writing. In these beginner-level learners, the applications observed included “everything,” particularly general strategies, high-level knowledge, and crucial processes of orchestration. About the same time, Lay (1982) applied the thinking aloud method to determine the writing processes in English (L2) of four Chinese students and found many of the strategies used by native language students in composing were also present in L2 learners. Furthermore, L2 writers translated L2 words into L1 to get a strong impression and association of ideas for the writing task, and these “switches” between the two languages tended to produce better writing in terms of ideas, organization, and details. Furthermore, she found when there are more L1 switches the L2 text can achieve better quality. The “switches” in this case probably can be viewed as a way of transferring L1 writing skills, and positive effects of transfer were observed specifically in ideas generation, organizing, and knowledge of the topic.

Many studies reported observations of positive transfer later. Wang and Wen (2003) applied the thinking aloud method to study L2 (English) writing using the same prompts (on same topics) of 16 Chinese-speaking university students with intermediate L2 proficiency and found positive effects on the whole writing process, particularly in idea generation organizing, knowledge of the topic, and rhetoric knowledge. In addition to analysis of writing pieces and using data from thinking aloud, Uzawa and Cumming (1989) also conducted a questionnaire survey on L2 (English) writing strategy of 10 Japanese-speaking university students with intermediate L2 proficiency and found positive effects on the whole planning process. Likewise, Carson and Kuehn (1992) analyzed writing pieces in both L1 and L2 using

different prompts (on different topics) from 48 Chinese native speakers who had educational level of high school graduate at least and obtained TOEFL scores from 420 to above 525 and found positive effects on the whole planning process. However, negative effects were also observed. Whereas Cumming (1989) observed a positive correlation between L1 and L2 expertise in the whole planning process of writing, the correlation was not regarded as transfer between the two. Nevertheless, in a re-analysis of the data (Cumming, 1990), positive transfers of linguistic knowledge were observed.

### ***Negative Effects of L1 Transfer***

On the basis of contrastive rhetoric, Grabe & Kaplan (1989) claimed that L2 learners writing expository prose in English will show organizational pattern different from those of native speakers and that each language and each culture has a paragraph order unique to itself. For L2 writers, contrastive rhetoric concerns might fall within the “rhetorical problem space,” and interference might be created when L1 rhetorical knowledge increases the complexity in the rhetorical problem space which will result in interference in L2 writing. Tsao’s (1983) also argued that the contrasts between languages (English and Chinese in this case) coupled with grammatical and stylistic interference made the writing of English looked so indirect. With that in mind, Mohan and Lo (1985) conducted a study probing 30 Chinese students’ perception of their experiences and problems in learning to write in English and concluded that transfer, either positive or negative, should not be expected in writers who have not yet acquired those skills in L1. They criticized Kaplan’s theory, particularly as it relates to Chinese writers of English, and argued that the problems may come from the students’ lack of familiarity with conventions of expository writing in their native language.

Whereas some studies showed that when L1 is dominant, or at least prestigious, it has no danger of being replaced by L2 (Lambert, 1975), the “balance effect” hypothesis proposed by Macnamara (1966) concluded that a bilingual child paid for his second language skills by a decrease in first language skills. Other studies also showed evidence that L1 writing proficiency may decline with L2 writing development (Carsen & Kuehn, 1992; Wang & Wen, 2002). Buckwalter and Gloria Lo (2002) concluded that children’s L2 development (English in this case) will surpass their primary language (L1). However, these arguments can only be regarded as supporting negative effects of L2 development on L1, rather than negative effects of L1 transfer on the development of L2.

Several studies that found positive effects of transfer also observed negative effects, mostly under certain conditions (Carson and Kuehn, 1992; Kobayashi and Rinnert, 1992; Woodall, 2002). For example, Kobayashi and Rinnert (1992) observed negative effects on L2 writing among high-level writers when they were asked to write in L1 (Japanese) first and then translate the work into L2 (English). However, the forced translation, although often applied in studies as a surrogate of transfer, is not a component of the regular L2 writing process among those high-level writers and thus is unlikely to occur in real life. Therefore, the study results can not be regarded as an evidence of a negative effect of L1 transfer, but rather evidence implying that lower-level writer are more likely to benefit from the transfer.

### ***Language-Specific Issues***

In the study conducted by Wong (1993) on students in Singapore, a bilingual country, while transfer from the stronger language (L1) to the weaker language (L2) were noted for both Chinese and English, a more prominent transfer was noted when the L1 was English. Another study on English writing of Chinese students found a better quality of L2 text can be achieved through more L1-L2 switches (Lay, 1982). However, in a study on L2 writing from 28 adult participants with different L1 backgrounds (9 Japanese, 11 English, and 8 Spanish), Woodall (2002) found L2 writers with cognate L1 benefited from longer periods of L1 use in the L2 writing , but writers with a non-cognate L1 produced lower quality text through using L1-L2 switches. Similarly, in a review of literature, Koda (1996) concluded that the L1-L2 orthographic distance is a factor of L2 word recognition.

Even though there are studies with regard to the L1 effects on L2 writing for various languages, paradox may exist in exploring the same language. For example, in Wong's (1993) study, the different orthographic principles between English and Chinese, as Chinese is a morphosyllabic language whereas English is an alphabet language, did not hinder students from applying L1 skills to L2 writing. However, a study on five elementary Chinese (Mandarin)-speaking students by McCarthy et al. (2005) observed little transfer from L1 into L2 (English) in their writing and attributed the lack of transfer to the wide differences in structural features of the two languages.

From a protocol analysis of L2 writing from 28 adult participants with different L1 backgrounds, Woodall (2002) found that less proficient L2 learners switched to their L1 more frequently and that more difficult tasks increased the duration of L1 use in L2 writing. However, students of a cognate language benefited from longer periods of L1 use, but for students using a non-cognate L1, L1-L2 switches was related to a

lower quality text. The results supported that the positive effects of L1 can only be observed under certain conditions, and the relationship between L1 and L2 seem to be one of the factors.

### ***Strengths and limitations of the methods***

As L2 writing process is variably complicated, researchers used research methods that are appropriate for their purposes. Three common research methods are identified: thinking aloud, analysis of writing pieces, and questionnaire survey. There were some variations in applying the same approach. For example, among the studies using the thinking aloud approach, some studied the process of L2 writing alone, some studied both L1 and L2 writing from each participant on different topics, and some studied writing pieces in both L1 and L2 from each participant on the same topic. While the research findings appear to be controversial, the methods adopted in analyzing the data are probably an important factor.

Comparing and analyzing the composing tasks in L1 and L2 as a measure can directly identify the factors that explain L2 writing products and report basic similarities between composing in L1 and L2. It can more easily observe the variations of text features from the product, such as spelling, structures, and styles. Since writing tasks differ in terms of task characteristics and the conditions under which writing was done, inferences about writers' L1 transfer based on analyses of their L2 texts may fail to account adequately for writers' production processes, their educational development (Mohan & Lo, 1985) and their competence in the L2 (Cumming, 1989, 1990). It may overlook the underlying cognitive dynamics occurring during the composing process and how the L2 writers access and juggle multiple cuing systems between L1 and L2. The topics of writings pieces varied widely across studies, and even within a study. It has been recognized that a limitation of this approach is that evidence from text analysis is inherently restricted in its capacity to explain why and in what way the writers compose the text (Cumming, 2001). In addition, this method is highly operator-dependent, and objectiveness is an issue.

The use of think-aloud protocols has been recognized as a credible measure in the research of the effect of L1 on L2 writing (Silva, 1989). Such verbal reports describe the writers' writing processes and the strategies employed during writing. Jones and Tetroe (1987) believed that the evidence derived from think-aloud protocol can help obtain the content of the plan and the elements and examine any modified part of plan. Such retrospective self-reports may elicit information that differs substantially from that which occurs spontaneously during composing. As the writing processes are

primarily cognitive and mentally self-directed, methods of investigation such as concurrent verbal reports and think-aloud protocol while composing can better elicit data about their thinking in respect to the form of the second language. Still, limitations are widely discussed. Smagorinsky (1994) argued about the restrictions and variability in people's capacities to report on their thinking, and distortions of natural context for composing. Cumming (2001) criticized that the method "has mostly: (a) required tightly-controlled, experimental conditions for writing; (b) found it challenging to explain exactly how specific composing processes lead to particular qualities of written products; and (c) involved relatively small numbers and select groups of learners." (Cumming, 2001; p.6)

Questionnaire about writing apprehension can reveal aspects of students' metalinguistic or metacognitive knowledge. This approach can be readily applied to studying a large number of participants, and if the same questionnaire is administered, the results are more comparable across studies. Therefore, the objectiveness issue seems to be more easily to overcome. In reality, however, few researchers used the same questionnaire from a previous study, and the validity of the questionnaire was seldom assessed. Furthermore, unlike the other two approaches which let the participants express themselves freely, by limiting the questions (and answers) in the questionnaire, this approach might overlook some important information, and the results tend to be dependent on the design of the questionnaire.

It should be noted that most of the studies involved a very small number of people, which limited the strength of evidence. Furthermore, they cannot sufficiently determine how the writing process may vary across individuals. In studies which analyzed writing pieces and studies applying the thinking aloud method, it was generally not described how the objectiveness was assured in the evaluation. The study by Carson and Kuehn (1992) had a relatively large number of participants, and standardized rating criteria were applied to ensure the objectiveness. In addition, outliers of ratings were re-evaluated.

## **Conclusion**

Overall, findings from the studies reviewed provide relatively strong evidence for transferability of writing competence across languages. Although a majority of the studies observed positive L1 transfer to L2 writing, some studies confirmed the L1 negative transfer to L2 composing.

During the last two decades, considerable progress has been made in understanding the cognitive operations involved in L2 writing. Most of the studies covered in this review support (1) there are positive effects of L1 transfer on L2 writing, particularly for writers with lower L2 proficiency, (2) writers with higher L2 proficiency may suffer from negative effects of L1 transfer as L2 writing ability increases, (3) L1 transfer has positive effects on all three cognitive writing processes of the revised seminal model, and (4) the positive effects of L1 transfer are observed in many languages but more prominent between similar languages.

Schooneh et al. (2003) stated writing in one's mother tongue is a demanding task that calls upon several language abilities, as well as upon more general (meta)cognitive abilities. These constituent abilities are in a constant interplay, and writing in L2 is even more demanding. Therefore, we should make good use of L1 transfer in the development of L2, but we also need to note that transfer may have negative effects as L2 writing ability reaches a certain level.

In view of the fact that each of the three approaches has its strength and limitation, it is advisable that multiple approaches should be applied to a single study, and researcher should try to use the same topic and a more standardized way to analyze that data, so that results from different studies can be more comparable.

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