

Exploring Identity Perception and Bilingual Education Dynamics in Taiwanese University Settings

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Abstract

In an increasingly interconnected world, proficiency in English is becoming indispensable, prompting Taiwanese universities to implement English language requirements ranging from one to four years. This initiative aligns with a national bilingual education program aimed at bolstering the English proficiency of college students to enhance their international competitiveness. Consequently, English-medium instruction has become prevalent in various university courses, facilitated by the Freshman English course serving as a transition to English-mediated teaching. While linguistic development is emphasized, the dynamics of identity perception among students cannot be overlooked, as language identity profoundly impacts their learning experiences and growth. This study delves into the identity perception of college freshmen in Taiwan, where bilingual education is heavily emphasized by the government. The purpose of the study is to investigate how Taiwanese college freshmen perceive their identity as they participate in English language learning. In addition, this study aims to examine the influence of gender and college major on the individual differences in identity perception among college freshmen engaged in English language learning. Employing Gao et al.'s (2005) Likert-scale questionnaire on self-identity change, the research surveyed 360 freshmen from a university in northern Taiwan. Data analysis performed with SPSS includes two stages. At the first stage, descriptive statistics revealed that participants exhibited agreement on self-identity changes in four categories: self-confidence, zero, productive and additive. At the second stage, a multivariate analysis of variance demonstrated significant main effects of gender and major on identity changes. Female students exhibited higher self-confidence, additive and productive changes compared to male students. Furthermore, liberal arts majors experienced more pronounced self-confidence, additive and productive changes than their counterparts in business, science, and engineering majors. A Post Hoc test unveiled significant differences, with business majors scoring higher than science majors in subtractive and split changes, while science majors differed significantly from liberal arts majors in zero change. The study's implications extend beyond theoretical understanding, informing pedagogical practices to enhance language learning experiences.

Keywords: bilingual education dynamics, college freshmen, EFL context, identity perception, Taiwan

1. Introduction

In response to the imperatives of globalization, Taiwan has recognized the pivotal role of English in bolstering international competitiveness. This proactive stance is evidenced by the implementation of the 2030 Bilingual National Policy Development Blueprint, which underscores the necessity of enhancing English proficiency among students (National Development Council, 2018). In addition, substantial investments in the Forward-looking Infrastructure Development Program further emphasize the commitment to fortifying infrastructure conducive to future growth and advancement across sectors (Executive Yuan, 2023). The urgency for students to attain global competitiveness has prompted universities to intensify English instruction, fostering a bilingual teaching environment aimed at elevating Taiwan's position in international higher education. Through initiatives such as promoting English as a medium of instruction (EMI), the Ministry of Education endeavors to strengthen students' English abilities, thereby enhancing the international competitiveness of Taiwan's higher education institutions.

Addressing the global demand for improved English skills, many educational systems worldwide, including Taiwan's, have integrated English into their mandatory curricula (Kirkpatrick, 2016; Ministry of Education,

2018). In Taiwan, English is compulsory from elementary through secondary schools, and all incoming freshmen at the university level are required to take a year-long Freshman English course (Chern, 2010). In recent years, universities have extended mandatory English courses beyond the freshman year, encompassing the sophomore, junior, and senior years. While English courses are commonly integrated into universities' general education requirements, the emphasis extends beyond mere linguistic proficiency. The Ministry of Education in Taiwan launched the Program on Bilingual Education for Students in College (referred to as the BEST program) in 2021, aiming to construct a bilingual teaching and learning environment in higher education institutions. This initiative seeks to enhance students' English proficiency and promote EMI to bolster the international competitiveness of higher education.

In the overall BEST program, there is a sub-program, the Generalized Enhancement program, which highlights the progress on the EMI support system and English proficiency resource system for students. This includes evaluating the effectiveness of the English teaching support system and the improvements in students' English proficiency. The mandatory Freshman English course is, of course, a prerequisite for improving all college students' English proficiency to facilitate their transition to EMI courses.

As part of the program, the Language Training and Testing Center (LTTC) is tasked with developing and administering the BEST Test of English Proficiency (BESTEP) (BESTEP, 2024). In Taiwan's BEST program for college students, it is essential to recognize the significance of English for students' future success. This importance extends beyond linguistic outcomes to encompass nonlinguistic transformations, including shifts in identity that influence perceptions of language and culture, as well as personal growth, experiences, cultural understanding, and cognition (Noels, Yashima, & Zhang, 2020).

While extensive efforts to promote bilingual education are commendable, a deeper understanding of identity perception among college students is crucial. Previous studies on college English courses prioritized enhancing linguistic outcomes, including teaching methodologies, enhancement programs, and proposals for standardized testing to evaluate effectiveness (Chern, 2010). However, research on students' identity perception in this context is limited. As the Freshman English course is mandatory for all college students, understanding freshmen's identity perception is essential for effective bilingual education. This understanding provides valuable insights into college students' English learning experiences, enabling educators to tailor pedagogical approaches effectively. Moreover, by comprehending how students perceive their identity in the context of language learning, educators can better support their linguistic and nonlinguistic development, fostering a more holistic approach to bilingual education. After all, education is a long-term endeavor. This study thus aims to address this gap by examining identity perception dynamics, thereby contributing to a deeper understanding of the multifaceted impacts of English language education.

2. Literature Review

In earlier literature, discussions on identity perception intersect with models of language learning outcomes. Gardner's (1985) socio-educational model, for instance, delineates two sets of outcomes: linguistic and nonlinguistic. Linguistic outcomes pertain to target language proficiency, while nonlinguistic outcomes encompass broader changes in the learner, such as attitudes towards language acquisition. Similarly, Lambert's (1975) model incorporates self-concept as a learning outcome. His distinction between subtractive and additive bilingualism has been influential in understanding learners' identity perception. Subtractive bilingualism involves the replacement of the native language and cultural identity with those of the target language, whereas additive bilingualism occurs when the acquisition of a second language and culture complements rather than replaces the first language and culture. As Baker (1993) aptly described, "when a second language and culture have been acquired with little or no pressure to replace or reduce the first language, an additive form of bilingualism may occur" (p. 95). Consequently, the relationship between language and identity has become a significant area of research in bilingualism and second language acquisition, as evidenced by studies conducted by Hall (2002), Norton (2000), and Schumann (1978).

English learning in the context of Far Eastern Asia differs significantly from the earlier studies mentioned. This distinction is notable in the contrast between learning English as a second language (ESL) and as a foreign language (EFL), where the immediate use of the target language outside the classroom may or may not be prevalent. However, regardless of whether it is learning a second or foreign language, the acquisition of a new language can lead to changes in a learner's perceptions of their competence, communication styles, and values. In portraying an ideal type of successful second/foreign language learning, Gao (2002) introduced the concept of productive bilingualism, wherein command of the target language and that of the native language positively reinforce each other. Gao (2002) emphasized that a deeper understanding and appreciation of the target culture

go hand in hand with a deeper understanding and appreciation of the native culture. Therefore, successful language learning transcends mere linguistic gains and involves a holistic process of cultural understanding and appreciation.

Building upon Gao's (2002) concept of productive bilingualism, empirical evidence was derived from open interviews with 52 adult learners recognized as the best foreign language learners in China, predominantly comprising professors, researchers and translators. These adult learners, who could provide reflective insights into their language learning experiences, demonstrated bilingual productiveness across cognitive, affective, and aesthetic domains, leading to overall personal growth. Moreover, Gao, Zhao, Cheng and Zhou (2007) argued that the additive concept ($1 + 1 = 2$), rooted in non-replacement, inadequately explains the overall value added to bilingualism exhibited among the best language learners. Consequently, as an ideal form of bilingualism, productive bilingualism could be symbolized as $1 + 1 > 2$, indicating that the whole exceeds the sum of its parts (Gao et al., 2007).

Empirical studies offer compelling evidence of the impact of identity on language learning. For example, Norton (1997, 2000) found that learners who view language learning as an investment in their identity are more likely to commit to ongoing efforts and long-term endeavors. Gao, Cheng, Zhao and Zhou (2005) demonstrated that college majors significantly influence identity construction, with English majors experiencing distinct identity shifts compared to other majors. The process of identity formation involves continuing interaction among personal, social and cultural factors. Positive identity formation enhances motivation, engagement, and academic performance by fostering a sense of belonging and purpose; conversely, negative identity experiences can lead to disinterest and lower achievement, often due to perceived marginalization or lack of support (Forbes et al., 2021; Norton Peirce, 1995; Stables, 2003). Understanding these dynamics is essential for educators to develop effective pedagogical strategies that support both linguistic and nonlinguistic development, ultimately promoting a more inclusive and motivating learning environment.

Gao et al. (2005) examined the relationship between English learning and identity perception among Chinese college students. Utilizing a quantitative approach, they surveyed 2278 undergraduates from 30 universities, employing a custom questionnaire that operationalized six categories of self-identity change. These categories included subtractive bilingualism, additive bilingualism, productive bilingualism, self-confidence, identity split, and zero change, drawing upon existing literature on bilingual identities (e.g., Clément, Dörnyei, & Noels, 1994; Lambert, 1975). Results revealed that English learning significantly influenced learners' perception of their own competency, with self-confidence emerging as the most notable change. In essence, learners' perception of their competence was the aspect of identity most affected by English learning. Moreover, the study found that learners also experienced productive and additive changes in their values and communication styles. These findings underscore the profound impact of English learning on identity perception within the EFL context in China, distinguishing it from ESL contexts. Furthermore, previous research suggests that achieving productive bilingualism, once thought to be attainable only by exceptional language learners (Gao, 2002), is actually quite common among ordinary college students. This highlights the need for a nuanced understanding of bilingualism and its implications for identity perception among college students.

In their subsequent research, Gao et al. (2007) advocated for a comprehensive approach to English language education in EFL contexts, emphasizing the importance of not only focusing on language proficiency but also on the learners themselves. They argued that the issue of self-identity in EFL settings is equally, if not more, crucial compared to ESL contexts. In addition, individual identity perception among learners may be intertwined with broader transformations in national or regional identity, influenced by ongoing processes of modernization or globalization (Ushioda, 2006). As a result, the nonlinguistic outcomes of English learning require significant attention from EFL researchers and educators, given that language learning can potentially induce shifts in learners' identities. Gao et al. (2007) highlighted the educational significance of the relationship between identity perception and language learning motivation. This underscores the need for educators to move beyond teaching language skills and standardized linguistic outcomes, and instead, to address the broader educational implications of language learning.

Recently, two studies by Chang (2022, 2024) offer valuable insights into Taiwan's language policy landscape and its implications for identity perception. Chang (2022) examines Taiwan's envisioned identity as a Mandarin-English bilingual nation within the framework of the 2030 Bilingual Nation policy. The study aimed to critically examine Taiwan's 2030 Bilingual Nation policy using a two-phase analysis of the Blueprint for Developing Taiwan into a Bilingual Nation by 2030 (National Development Council, 2018). The first phase involves a macro-level analysis of keywords, while the second phase employs a micro-level qualitative content analysis to identify themes and patterns in the government's portrayal of national identities and its vision for the

future. The study uncovers dominant discourses shaping Taiwan's top-down imagination and reimagination, emphasizing the primacy of English and its association with global competitiveness. However, it also highlights the need for a more critical and inclusive approach that acknowledges Taiwan's linguistic diversity and cultural heritage.

In contrast, Chang's (2024) study focuses on Taiwanese university students' perceptions of the Bilingual 2030 policy, employing Stance Theory (Du Bois, 2007) to analyze their evaluations and self-positioning. This study examines 43 undergraduate students, mainly majoring in English, from a top-ranking public research university in northern Taiwan, enrolled in sociolinguistics classes taught by the researcher. They were tasked with writing position papers on the Bilingual 2030 policy over a 4-week period. Qualitative content analysis of the papers was conducted in three phases: identifying each student's stance, examining evaluations and self-positioning, and parsing out prevalent discourses. The study reveals students' diverse responses, challenging the top-down narrative of national identity construction and emphasizing the complex linguistic and social realities in Taiwan. By examining students' nuanced understandings and critical reflections on the policy, the study underscores the importance of incorporating diverse stakeholder perspectives in language policy discussions and promoting a more inclusive and participatory approach to policy formulation and implementation.

Together, Chang's (2022, 2024) studies provide a comprehensive overview of Taiwan's language policy landscape and its impact on identity perception, emphasizing the importance of a nuanced and inclusive approach to language policy development. Chang's 2022 study highlights Taiwan's emphasis on English proficiency for global competitiveness in language policy, alongside the call for inclusivity to recognize linguistic diversity. Her 2024 study underscores the importance of integrating diverse perspectives in policy discussions and promoting inclusive policy implementation, as evident in students' critical reflections. However, there remains a need for further exploration of learners' identity perception, particularly through quantitative analysis within the national bilingual program to identify statistical patterns or trends. Specifically, Freshman English is required to facilitate a smooth transition for college students into subsequent years of EMI instruction.

In the dynamic context of English language education, learners bring diverse identities. Consequently, it is essential to further explore the impact of individual differences. Recognizing that traditional, one-size-fits-all approaches to language education are inadequate for a diverse learner population, highlights the necessity of addressing learner diversity in English language education (Tran & Duong, 2024). The conceptualization of gender as an individual variable has significantly enriched the understanding of the relationship between gender and language learning in classrooms. Norton and Pavlenko (2004a, 2004b) have extensively explored how gender influences language learning and identity formation, revealing that gender dynamics play a crucial role in shaping learning experiences. These advancements point out the requirement for examining gender-specific effects in language learning, providing a foundation for investigating how gender influences identity perception in the context of English language education for Taiwanese college students. Similarly, college majors contribute differently to identity perception. For instance, Gao, Li and Li (2002) have found that English majors experience distinct identity construction compared to other majors, underscoring the need to consider academic disciplines when addressing learner diversity. This focus on college majors, much like the consideration of gender, emphasizes the varied factors that influence identity formation in educational settings.

The current study aims to address a research gap in understanding Taiwanese college freshmen's perceptions of their identity during English language learning by drawing from existing theories of bilingualism and striving for a comprehensive combination of these theories tailored to the EFL context of Taiwan. In addition, the study seeks to explore the influence of gender and college major as individual differences on identity perception among college freshmen engaged in English language learning. By investigating the dynamics of identity perception, the study endeavors to provide a comprehensive understanding of the multifaceted impacts of English language education. These insights will guide pedagogical approaches beyond linguistic proficiency outcomes, significantly contributing to our understanding of the broader impacts of English learning in EFL contexts. The research questions guiding this study are as follows:

- (1) How do Taiwanese college freshmen perceive their identity following exposure to English learning?
- (2) What impact do gender and college major have on individual differences in identity perception among college freshmen engaged in English learning?

3. Method

3.1 Participants

The study included 360 college freshmen enrolled in a Freshman English course at a university in northern Taiwan, consisting of 189 male and 171 female students. On average, these students had been learning English for 12 years since elementary school. Their proficiency levels ranged from intermediate to advanced, as assessed by the university's placement test. However, proficiency levels were not considered as an independent variable due to uncertainty about the alignment of the placement test with standardized proficiency tests like TOEIC and TOEFL. Moreover, classes were not divided based on proficiency levels but were instead organized by department, resulting in a mixed-ability student body. Consequently, proficiency levels were excluded from consideration. English majors were intentionally excluded from the study to ensure a homogeneous group for focused examination of the topic in question, as many English majors are exempt from the Freshman English course. In addition, the course aims to enhance the language abilities of all first-year students, particularly non-English majors, preparing them for EMI courses tailored to their specialized fields in subsequent years, which is a core component of the Taiwan Bilingual Program. The participants represented a diverse range of majors, coming from a total of seven departments. To facilitate effective comparison of individual differences among groups, majors were categorized based on their respective colleges, as detailed in Table 1.

Table 1. Distribution of Majors by College among Participants

Major by College	Department	No. of Participants	Subtotal
Business	International Business	45	98
	Information Management	53	
Science	Physics	44	99
	Psychology	55	
Liberal Arts	Teaching Chinese as a Second Language	56	56
Engineering	Environmental Engineering	51	107
	Chemical Engineering	56	
Total			360

3.2 Instrument

The instrument utilized in this study was a questionnaire adopted from Gao et al. (2005), consisting of 24 items designed to measure participants' perception of self-identity change (see Appendix). The decision to employ this instrument was based on its alignment with existing literature on bilingual identities, extending its applicability to the context of EFL learning among Taiwanese students. Given the unique linguistic and cultural dynamics of language learning in Far Eastern Asian contexts compared to Western settings, and the distinction between EFL and ESL contexts, tailored instruments were deemed necessary. The questionnaire assessed self-identity change through 24 items, utilizing a five-point Likert scale (5 = strongly agree; 4 = agree; 3 = uncertain; 2 = disagree; 1 = strongly disagree). There were a total of six categories representing shifts in self-identity, each comprising four elements. These categories are explained as follows:

(1) Change in self-confidence involves an alteration in one's perception of personal competence. Examples include feeling confident when excelling in English, doubting abilities during difficulties, and recognizing growth after overcoming challenges (Items 1-4).

(2) Additive change entails the simultaneous existence of two language sets, behaviors and values tailored to specific contexts. Instances incorporate easily switching between Chinese and English, having different levels of confidence in each language, and preferring original language dialogues in movies (Items 5-8).

(3) Subtractive change encompasses the replacement of native language and cultural identity with those of the target language. Examples involve feeling less idiomatic in Chinese, adopting Western behaviors, and rejecting traditional Chinese ideas (Items 9-12).

(4) Productive change involves mutual reinforcement of proficiency in both native and target languages. Examples include better appreciation of subtleties in the native language, increased sensitivity to external changes, and improved communication skills (Items 13-16).

(5) Split change entails identity conflict arising from struggles between languages and cultures. Examples include the subconscious mixing of languages, confusion in behavioral patterns, and conflicts in values and beliefs (Items 17-20).

(6) Zero change represents the absence of self-identity alterations. Examples include remaining unchanged regardless of the language used and viewing oneself as inherently constant (Items 21-24).

According to Gao et al. (2005), zero change was used as a reference point for comparing different categories of self-identity changes, while self-confidence change is regarded as independent of cultural identities. The remaining four categories represent changes in cultural identity. However, in line with Festinger's (1957) theory of cognitive dissonance, conflicting attitudes and behaviors must be resolved. Hence, split change is seen as an intermediate phase, with learners often developing other types of identity changes afterward to alleviate cognitive dissonance.

3.3 Data Collection and Analysis

Prior to the main study, a pilot study was conducted to assess the questionnaire's reliability. Out of 231 distributed copies, 200 valid responses were obtained (return rate of 87%), with a Cronbach's alpha reliability coefficient of 0.70, indicating acceptable internal consistency. This result demonstrates that the questionnaire is reliable and suitable for data collection to address the research questions. In light of the satisfactory outcome of the pilot study, minor adjustments were made to the questionnaire, primarily focused on improving the clarity and comprehensibility of the Chinese translation for implementation in the main study.

During the main study, participants were guaranteed anonymity and assured that their answers would not impact their course grades. The distribution of questionnaires was authorized by course instructors, and involvement was voluntary, without any incentives offered. From the 398 questionnaires distributed, 360 valid responses were gathered, yielding a return rate of 90%. These responses exhibited satisfactory internal consistency, with a reliability coefficient of 0.73.

The data analysis, carried out using SPSS, comprised two primary stages. Firstly, descriptive statistics were calculated for the different categories of self-identity change. Following this, a multivariate analysis of variance (MANOVA) was utilized to assess how gender and college major influenced individual differences in identity perception among college freshmen involved in English language learning. MANOVA was selected due to its appropriateness in analyzing the impacts of several independent variables, like gender and major, on two or more dependent variables, represented here by the six categories of self-identity change.

4. Results and Discussion

This section presents the results of the data analysis and subsequent discussion, aiming to address the research questions regarding how Taiwanese college freshmen perceive their identity in English learning, and the influence of gender and college major on individual differences in identity perception among those engaged in English learning. As the instrument employs a 5-point Likert scale, with scores ranging from 1 to 5, and each category of self-identity change in the questionnaire comprises four items, totaling a possible score of 20, a critical value of 12 is used to distinguish between changed and unchanged states, indicating the threshold at which participants agree with self-identity changes in each category. The following part will detail the results of the data analysis and ensuing discussion in response to the two research questions.

4.1 How do Taiwanese College Freshmen Perceive their Identity Following Exposure to English Learning?

Table 2 presents descriptive statistics of how Taiwanese college freshmen perceived their identity across six categories of self-identity change. The most noticeable change for these participants was in self-confidence (mean = 14.73), indicating that many students experienced shifts in their perception of personal competence. The second-highest score (mean = 14.37) under zero change suggests a lack of exposure to the target culture in the Taiwanese EFL context. However, there were some changes in the cultural aspects of learner identity, with the productive (mean = 12.47) and additive (mean = 12.43) types showing apparent changes. This result suggests that productive bilingualism, as proposed by Gao (2002), also exists among Taiwanese college freshmen, although the mean score is just slightly higher than 12. Therefore, quite a few participants in this study recognized productive bilingualism, agreeing that a deeper understanding of the target culture is linked to that of the native culture.

Table 2. Descriptive Statistics for Self-identity Changes

	Self-confidence	Zero	Productive	Additive	Split	Subtractive
Valid no. of students	360	360	360	360	360	360
Means	14.73	14.37	12.47	12.43	10.26	8.74
SD	3.35	3.39	3.02	2.85	2.87	3.32

Next, the responses to statements for each self-identity change category will be discussed, reflecting the extent (descriptive statistics indicating the percentages of choices) to which they agree, disagree, or express uncertainty. Under self-confidence changes, it's noteworthy that up to 60% of students question their own competence when facing challenges in learning English. While previous research often emphasized the role of self-confidence in language learning (e.g., Clément et al., 1994), Gao et al. (2005) proposed that self-confidence can be an outcome of English learning. It's not merely a cause for learners to pursue language proficiency but can also result from language learning. In addition, 73.8% of students reported feeling accomplished when their English proficiency surpassed that of others, and 71.3% noted personal progress when overcoming challenges in English learning. Self-confidence can serve as both a motivator for achieving more in English learning and as a consequence of overcoming difficulties and progressing in English proficiency. This clarifies why up to 64.9% of students agree that English learning significantly impacts their self-confidence (see Table 3).

Table 3. Responses to Statements Reflecting Self-confidence Change

Questionnaire item	Valid no. of students	Strongly agree & Agree	Uncertain	Strongly disagree & Disagree
1. I feel terrific when I find my command of English is better than that of others.	360	73.8%	15.3%	10.9%
2. English learning has a great impact on my self-confidence.	359	64.9%	20.9%	14.2%
3. When I have difficulties in English learning, I begin to doubt my own ability.	360	60.0%	18.3%	21.7%
4. Whenever I have overcome a difficulty in English learning, I can feel my own growth.	359	71.3%	17.5%	11.2%

In the context of zero change, the second highest score (mean = 14.37) likely suggests a limited exposure to the target culture within the Taiwanese EFL environment. Notably, a significant majority (77.8%) of students maintain their sense of self irrespective of the language they use, implying a lack of significant shifts in self-identity when communicating in English. This observation aligns with the perspective that, for many students (72.5%), English primarily functions as a tool for communication and does not lead to fundamental transformations in their identities. What's more, 46.1% of students report no perceived changes in themselves after participating in English language learning. However, responses to Item 24 are mixed: 38% agree that discussing personal changes after learning English is meaningless, 31.4% disagree, and 30.6% are uncertain. Therefore, responses to Item 24 do not clearly indicate whether students undergo zero change in self-identity (refer to Table 4).

Table 4. Responses to Statements Reflecting Zero Change

Questionnaire item	Valid no. of students	Strongly agree & Agree	Uncertain	Strongly disagree & Disagree
21. No matter which language is used for expression, I remain to be myself.	360	77.8%	13.9%	8.3%
22. I have not felt any change in myself after learning English.	360	46.1%	28.9%	25.0%
23. An instrument is an instrument. It is impossible for me to change into another person after learning a language.	360	72.5%	16.9%	10.6%
24. For me, it is meaningless to talk about personal changes after learning English.	360	38.0%	30.6%	31.4%

As highlighted by Gao et al. (2005), zero change serves as a benchmark for assessing various categories of self-identity shifts, signifying the absence of alterations in one's self-perception. Significantly, many students retained a consistent self-image regardless of the language used, likely due to limited exposure to the target culture within the Taiwanese EFL environment. Since zero change was employed as a reference point, the subsequent analysis delves into students' experiences of self-identity changes concerning cultural identity. It's worth noting that language learning encompasses more than just changes in proficiency; it also involves transformations in values, behaviors, communication styles, beliefs, and other non-linguistic outcomes.

For productive change, the third highest score (mean = 12.47) emphasizes the mutual reinforcement of proficiency in both native and target languages. Particularly, 49.8% of students reported a better appreciation of nuances in Chinese as their English proficiency improved, while 43.1% became more attuned to external changes after engaging in English learning, reflecting an increased sensitivity to external stimuli. However, changes in empathy or communication skills post-English learning were less apparent (in response to Item 15). Moreover, students' growing appreciation for English literature and arts did not correspond with an increased interest in Chinese literature and arts (in response to Item 16). Therefore, although the mean score of 12.47 indicates that students agree they experience productive change in identity, agreement for Items 13 to 16 is all below 50%, demonstrating notable differences in students' opinions on these items (see Table 5).

Table 5. Responses to Statements Reflecting Productive Change

Questionnaire item	Valid no. of students	Strongly agree & Agree	Uncertain	Strongly disagree & Disagree
13. With the improvement of my English proficiency, I can better appreciate the subtleties in Chinese.	360	49.8%	33.3%	16.9%
14. After learning English, I find myself more sensitive to changes in the outside world.	359	43.1%	34.3%	22.6%
15. After learning English, I have become more understanding and can better communicate with others.	360	31.7%	38.9%	29.4%
16. As my ability of appreciating English literature and arts increases, I have become more interested in Chinese literature and arts.	359	26.2%	36.8%	37.0%

As previously discussed, Gao (2002) introduced the concept of productive bilingualism as an optimal language learning approach. Furthermore, she pointed out the limitations of the additive change approach, which involves the simultaneous presence of two language sets without replacement, in fully capturing the benefits observed in highly proficient language learners. In this study, the mean (12.47) for productive change slightly exceeds that for additive change, with a mean of 12.43. However, both means surpass the critical value of 12, indicating significant changes.

In the additive change category, 58.9% of students have both English and Chinese names, each used in specific contexts, while 57.1% prefer English dialogue in English movies and Chinese dialogue in Chinese movies. However, only 19% feel capable of seamlessly switching between Chinese and English, and just 15.6% report feeling self-assured when communicating in English and more reserved when using Chinese (Table 6). This is likely because students are learning English in an EFL context, where daily opportunities to use English are limited. Unlike an ESL context, where there are daily opportunities to switch between two languages, it is less likely for students to easily switch between languages and naturally adapt to the expressive styles of both.

Table 6. Responses to Statements Reflecting Additive Change

Questionnaire item	Valid no. of students	Strongly agree & Agree	Uncertain	Strongly disagree & Disagree
5. I can easily switch between Chinese and English according to situational needs.	359	19.0%	39.8%	41.2%
6. I am relatively confident when speaking in English, and relatively modest when speaking in Chinese.	360	15.6%	35.8%	48.6%
7. I prefer to listen to the original English dialogue when watching English movies, just as I enjoy the original Chinese dialogue when watching Chinese movies.	359	57.1%	21.4%	21.5%
8. I have an English name in addition to my Chinese name. They are used in different situations.	360	58.9%	26.1%	15.0%

Given that the additive change approach originates from ESL learning contexts, Gao (2002) proposed productive bilingualism as an effective language learning method for EFL learners. In this study, the mean score for productive change (mean = 12.47) is higher than that for additive change (mean = 12.43). Therefore, Taiwanese college freshmen perceived more change involving the mutual reinforcement of proficiency in both native and target languages (productive change) than in the simultaneous existence of two language sets, behaviors and values tailored to specific contexts (additive change). This result also highlights the difference between ESL and EFL learning contexts, where immediate use of the target language in daily lives is less common in Taiwan. Although Gao's (2002) study focused on adult learners, including professors, researchers and translators, showcased bilingual proficiency across cognitive, affective and aesthetic areas, fostering holistic personal development through their language learning experiences, her advocacy for productive bilingualism as an ideal type of bilingualism for EFL learners is also applicable to Taiwanese college students.

Split and subtractive changes, with means of 10.26 and 8.74, respectively, did not surpass the critical value of 12 used to distinguish between changed and unchanged states. As observed in Tables 7 and 8, the majority of students express disagreement about split and subtractive changes.

For split change, Table 7 indicates that most students do not experience significant conflict when mixing Chinese and English in their speech or switching between cultural behaviors. Specifically, 58.1% of students strongly disagree or disagree with feeling weird when their Chinese speech is mixed with English words (Item 17), and 58.4% strongly disagree or disagree with feeling a painful split when switching between English and Chinese behavioral patterns (Item 18). Only 18.1% of students express agreement with Item 20, about being caught between conflicting values and beliefs, which could indicate internal conflict. However, it's worth noting that 41.4% of students express uncertainty about how to bid farewell to foreign friends (Item 19). This uncertainty suggests a lack of clarity regarding appropriate cultural norms for parting ways with friends from other cultures, such as whether to shake hands, hug, or kiss, and may indicate limited exposure or contact with the target culture. Split change could be seen as a transitional stage where students experience internal conflict between contradicting values and beliefs after learning English. To circumvent cognitive dissonance, learners undergoing split change might subsequently cultivate alternative forms of identity shifts (Festinger, 1957; Gao et al., 2005).

Table 7. Responses to Statements Reflecting Split Change

Questionnaire item	Valid no. of students	Strongly agree & Agree	Uncertain	Strongly disagree & Disagree
17. I feel weird when my speech in Chinese is subconsciously mixed with English words.	360	19.1%	22.8%	58.1%
18. I feel a painful split when I switch between English and Chinese behavioral patterns.	360	16.9%	24.7%	58.4%
19. When parting with foreign friends, I'm frequently confused as to whether I should shake hands or hug and kiss.	360	23.3%	41.4%	35.3%
20. After learning English, I'm often caught between contradicting values and beliefs.	358	18.1%	27.7%	54.2%

Regarding subtractive change, Table 8 reveals that a large proportion of students strongly disagree or disagree with statements reflecting a loss of Chinese cultural identity after learning English. For instance, up to 76.3% of students strongly disagree or disagree with feeling repugnant to some Chinese conventions after learning English (Item 11). Similarly, in Item 12, 73.3% of students strongly disagree or disagree with starting to reject some traditional Chinese ideas after learning English. Furthermore, in Item 9, 68.9% of students strongly disagree or disagree with feeling that their Chinese is becoming less idiomatic as their English proficiency improves. However, it's essential to recognize the substantial percentage of students expressing uncertainty in Item 10, with a percentage of 26.7%, indicating some ambiguity or internal conflict about whether their behaviors have become somewhat Westernized after learning English. These results suggest a strong preservation of Chinese cultural identity among students, despite their engagement in English language learning. Overall, these findings underscore the complex interplay between language learning and cultural identity formation, highlighting the need for educators to support students in navigating these challenges while fostering a positive bilingual experience.

Table 8. Responses to Statements Reflecting Subtractive Change

Questionnaire item	Valid no. of students	Strongly agree & Agree	Uncertain	Strongly disagree & Disagree
9. With the improvement of my English proficiency, I feel my Chinese is becoming less idiomatic.	360	10.8%	20.3%	68.9%
10. After learning English, I feel my behaviors have become somewhat Westernized.	360	16.4%	26.7%	56.9%
11. After learning English, I feel repugnant to some Chinese conventions.	360	9.8%	13.9%	76.3%
12. After learning English, I begin to reject some traditional Chinese ideas.	359	10.0%	16.7%	73.3%

4.2 What Impact do Gender and College Major have on Individual Differences in Identity Perception among College Freshmen Engaged in English Learning?

To explore the impact of gender and major on identity perception, a MANOVA test was employed, using the six types of self-identity changes as dependent variables and gender along with college major as independent variables. The results of the MANOVA revealed significant main effects for both gender ($F[6, 353] = 6.32, p = .000$) and major ($F[18, 993] = 2.48, p = .001$) on identity changes. Subsequent analysis will probe the main effects of gender and major on these changes.

The MANOVA analysis disclosed significant gender effects on identity perception across three categories (Figure 1): self-confidence ($F[1, 358] = 27.64, p = .000$), additive ($F[1, 358] = 12.23, p = .001$) and productive ($F[1, 358] = 7.39, p = .007$). Female students scored higher than male students in self-confidence ($MD = 1.794, p = .000$), additive ($MD = 1.034, p = .001$) and productive changes ($MD = .860, p = .007$), indicating their experience of greater self-confidence, additive and productive changes. Despite the lack of significant difference,

female students also scored slightly higher than male students in zero change ($MD = .149$, $p = .679$); conversely, male students scored moderately higher in subtractive ($MD = .360$, $p = .304$) and split changes ($MD = .191$, $p = .529$).

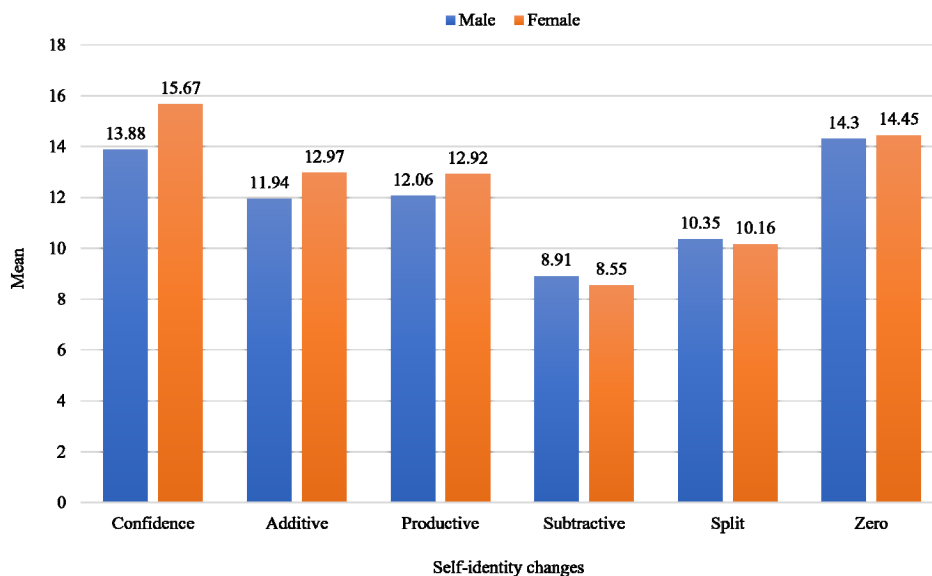


Figure 1. The Effect of Gender on Self-identity Changes

Female students demonstrated greater sensitivity to both success and frustration in their English learning experiences, manifesting more pronounced changes in self-perception, including feeling confident when successful in English, doubting their abilities during challenges, and recognizing personal growth after overcoming obstacles (i.e., self-confidence change). In addition, they showed a stronger inclination towards the simultaneous existence of two sets of language, behavior and values tailored to specific situations, as evidenced by their agreement on their ability to switch languages effortlessly, varying levels of confidence in each language, and preference for original language dialogues in movies (i.e., additive change). Furthermore, female students exhibited enhanced proficiency in both their native and target languages, indicated by their improved understanding of subtleties, heightened awareness of external changes, and enhanced communication skills (i.e., productive change). These findings align with Gao et al.'s (2005) study, suggesting that female students may be more susceptible to changes in self-confidence and exhibit more permeable ego boundaries, leading to increased adaptability in managing conflicts between different linguistic and cultural frameworks through situational adjustments or productive integration.

College major also had significant main effects on identity perception across the same three categories: self-confidence ($F[3, 356] = 5.13$, $p = .002$), additive ($F[3, 356] = 6.48$, $p = .000$) and productive ($F[3, 356] = 3.68$, $p = .012$) (see Figure 2). Remarkably, liberal arts majors exhibited more pronounced changes than other majors across all three categories. Firstly, significant differences were found between liberal arts majors and business majors ($MD = 2.166$, $p = .000$), between liberal arts majors and science majors ($MD = 1.418$, $p = .010$), and between liberal arts majors and engineering majors ($MD = 1.396$, $p = .011$) regarding self-confidence changes. Liberal arts majors experienced more changes in self-perceived competence, such as feeling confident in success, doubting abilities in challenges, and acknowledging growth after overcoming obstacles.

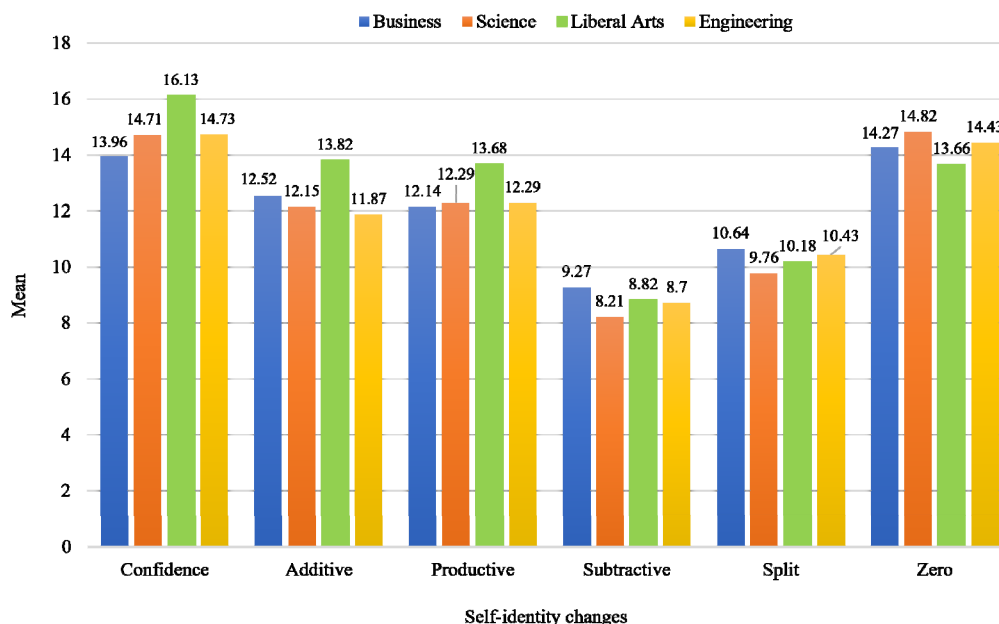


Figure 2. The Effect of Major on Self-identity Changes

Secondly, liberal arts majors demonstrated more changes in additive change compared to business majors ($MD = 1.301$, $p = .006$), science majors ($MD = 1.670$, $p = .000$) and engineering majors ($MD = 1.952$, $p = .000$). This suggests that liberal arts majors have a stronger tendency toward the coexistence of two language sets, behaviors, and values in specific situations.

Thirdly, liberal arts majors experienced more changes in productive change than business majors ($MD = 1.536$, $p = .002$), science majors ($MD = 1.386$, $p = .006$) and engineering majors ($MD = 1.389$, $p = .005$). This indicates that liberal arts majors demonstrated a greater enhancement of proficiency in both native and target languages compared to other majors.

The liberal arts majors in this study were from the department of Teaching Chinese as a Second Language (TCSL; Table 1), which focuses on preparing Chinese teachers with international mobility, professional language teaching skills, and foreign language proficiency to promote Chinese culture worldwide. As a result of their departmental focus, these students may have exhibited greater sensitivity to both success and frustration in their English learning experiences, leading to more pronounced changes in self-confidence change, a stronger inclination towards the simultaneous existence of two language sets (additive change), and enhanced proficiency in both their native and target languages (productive change) compared to students in other majors.

The finding that liberal arts majors displayed more pronounced changes than other majors across self-confidence, additive and productive changes resonates with Gao et al.'s (2005) study in China, which observed similar patterns among English majors. However, in Gao et al.'s (2005) study, English majors also experienced significant changes in subtractive aspects, indicating a stronger inclination towards Westernization. Gao et al. (2005) explained that English majors may reject or toggle between native cultures, languages, and cultural norms, or integrate them more effectively. In contrast, students from the TCSL department did not undergo significant subtractive changes. This discrepancy may stem from the nature of their profession, which focuses on promoting the Chinese language and culture to non-Chinese speakers. While English majors devote significant time and effort to integrating themselves into the English language and culture, TCSL majors prioritize promoting the Chinese language and culture to an international audience. Therefore, while both TCSL and English majors experience changes in self-confidence and cultural identity through their engagement in English learning, English majors may exhibit more pronounced Westernization.

In the current study, it is interesting to note that the trends of changes in each major appear to be developing similarly. This means that there are no particularly extreme differences within each category. For example, in terms of self-confidence change, the mean scores for each major are relatively high; for subtractive change, none of the mean scores for each major exceed the critical value.

The significant main effects of major on self-confidence, additive, and productive changes were detected, prompting a Post Hoc test to explore other significant differences among these multiple groups. Concerning subtractive change, business majors scored markedly higher than science majors ($MD = 1.053$, $p = .026$), indicating that business majors experience more substitution of their native language and cultural identity with the target language compared to science majors. This might be because business majors are more frequently exposed to international business practices and interactions, which necessitate a greater adaptation to the target language and culture. Similarly, regarding split change, business majors also scored significantly higher than science majors ($MD = .885$, $p = .030$), suggesting that business majors experience more identity conflict stemming from language and cultural struggles than science majors. This might be explained by the diverse and often conflicting demands of the global business environment, which requires business majors to navigate multiple cultural and linguistic contexts. Conversely, for zero change, science majors scored substantially higher than liberal arts majors ($MD = 1.158$, $p = .042$), indicating that science majors experience more absence of self-identity changes than liberal arts majors. The reason for this might be that science majors' studies are less focused on cultural and linguistic aspects, leading to fewer opportunities for identity changes.

5. Conclusion

The conclusion of this study reveals significant insights into identity perception dynamics in EFL contexts and their relevance to bilingual education. Taiwanese EFL college freshmen experience notable changes in self-confidence, productive, and additive aspects, indicating enhanced proficiency and a balanced integration of language sets, behaviors and values. Most maintain a stable self-identity across languages, with no significant subtractive or split changes observed. Gender and college major differences influence identity perception, with females showing more self-confidence, additive and productive changes. Liberal arts majors exhibit the most pronounced changes across self-confidence, additive and productive ones, while business majors show more subtractive and split changes, and science majors demonstrate a greater absence of self-identity changes.

5.1 Theoretical and Pedagogical Implications

The findings of this study contribute significantly to the theoretical understanding of identity perception dynamics in EFL contexts. By examining the nuanced changes in self-confidence, productive and additive aspects among Taiwanese EFL learners, the study adds depth to existing literature on bilingualism and identity development. These insights underscore the importance of considering individual differences, such as gender and major, in understanding how identity perception evolves within language learning environments. Moreover, the absence of significant subtractive or split changes suggests stable self-identity maintenance among learners, challenging previous assumptions about identity fluidity in bilingual settings. Theoretical frameworks, such as those proposed by Baker (1993), Lambert (1975) and Gao (2002), provide a lens through which to interpret these findings and highlight the need for further research into the intricate interplay between language learning, cultural identity, and psychological development.

From a pedagogical standpoint, the insights from this study have several implications for English language teaching in Taiwan and similar EFL contexts. Educators can use the findings to design more tailored language learning programs that address the specific needs and challenges faced by different student populations. For instance, acknowledging the greater self-confidence and adaptive capacity observed among female learners can inform teaching strategies that foster a supportive and inclusive learning environment for all students. In addition, recognizing the pronounced changes in self-identity perception among liberal arts majors underscores the importance of interdisciplinary approaches to language education that integrate cultural studies and language proficiency development. Furthermore, the identification of business majors' higher propensity for subtractive and split changes suggests the need for targeted interventions aimed at promoting a more balanced integration of linguistic and cultural identities in professional contexts. Overall, these pedagogical implications emphasize the importance of adopting a holistic approach to language education that considers the multifaceted nature of identity development within EFL settings.

5.2 Limitations of the Study and Suggestions for Future Research

While the study provides valuable insights into identity perception dynamics among Taiwanese college freshmen engaged in English language learning, several limitations warrant consideration. Firstly, the sample size and representativeness of the participants may be limited, potentially affecting the generalizability of the findings. Future research could address this by employing larger and more diverse samples to enhance the external validity of the results. Secondly, the cross-sectional design utilized in the study limits the establishment of causal relationships between variables. Longitudinal studies could provide a more comprehensive understanding of how gender and college major influence identity perception over time.

In addition, reliance on self-report measures for assessing identity perception may introduce bias or social desirability effects. Employing objective measures or triangulating findings with multiple methods, including mixed methods for data collection and analysis, could strengthen the validity of the results. Incorporating qualitative methods such as interviews or reflection reports would allow for a more comprehensive and in-depth exploration of students' identity perceptions.

Furthermore, the study may not adequately control for confounding variables such as English proficiency, socioeconomic status, or cultural background, which could impact the interpretation of findings. Future research should consider controlling for these variables to better isolate the effects of gender and college major on identity perception. The inclusion of English proficiency as a variable is particularly crucial, as it could significantly influence identity dynamics.

Moreover, the cultural specificity of the study population limits the generalizability of the findings to other cultural or linguistic contexts. Comparative studies across different cultural settings could provide a more nuanced understanding of identity perception dynamics. Finally, while the theoretical frameworks utilized in this study offer valuable insights, varying interpretations may lead to potential biases in analysis and findings. To mitigate this, future research could benefit from providing explicit and detailed definitions of key concepts and theoretical assumptions. By enhancing clarity and transparency in theoretical application, researchers can strengthen the validity and robustness of their findings, thereby contributing to the advancement of knowledge in the field.

Addressing these limitations could strengthen the methodological rigor and validity of studies in this area, advancing our understanding of identity perception in EFL contexts.

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Appendix

Questionnaire Exploring Changes in Identity Perception During English Learning

(Adopted from Gao et al., 2005)

Please circle one number below to indicate your level of agreement with each statement. 1 = Strongly Disagree; 2 = Disagree; 3 = Uncertain; 4 = Agree; 5 = Strongly Agree.

1.	I feel terrific when I find my command of English is better than that of others.	1	2	3	4	5
2.	English learning has a great impact on my self-confidence.	1	2	3	4	5
3.	When I have difficulties in English learning, I begin to doubt my own ability.	1	2	3	4	5
4.	Whenever I have overcome a difficulty in English learning, I can feel my own growth.	1	2	3	4	5
5.	I can easily switch between Chinese and English according to situational needs.	1	2	3	4	5
6.	I am relatively confident when speaking in English, and relatively modest when speaking in Chinese.	1	2	3	4	5
7.	I prefer to listen to the original English dialogue when watching English movies, just as I enjoy the original Chinese dialogue when watching Chinese movies.	1	2	3	4	5
8.	I have an English name in addition to my Chinese name. They are used in different situations.	1	2	3	4	5
9.	With the improvement of my English proficiency, I feel my Chinese is becoming less idiomatic.	1	2	3	4	5
10.	After learning English, I feel my behaviors have become somewhat Westernized.	1	2	3	4	5
11.	After learning English, I feel repugnant to some Chinese conventions.	1	2	3	4	5
12.	After learning English, I begin to reject some traditional Chinese ideas.	1	2	3	4	5
13.	With the improvement of my English proficiency, I can better appreciate the subtleties in Chinese.	1	2	3	4	5
14.	After learning English, I find myself more sensitive to changes in the outside world.	1	2	3	4	5
15.	After learning English, I have become more understanding and can better communicate with others.	1	2	3	4	5
16.	As my ability of appreciating English literature and arts increases, I have become more interested in Chinese literature and arts.	1	2	3	4	5
17.	I feel weird when my speech in Chinese is subconsciously mixed with English words.	1	2	3	4	5
18.	I feel a painful split when I switch between English and Chinese behavioral patterns.	1	2	3	4	5
19.	When parting with foreign friends, I'm frequently confused as to whether I should shake hands or hug and kiss.	1	2	3	4	5

20.	After learning English, I'm often caught between contradicting values and beliefs.	1	2	3	4	5
21.	No matter which language is used for expression, I remain to be myself.	1	2	3	4	5
22.	I have not felt any change in myself after learning English.	1	2	3	4	5
23.	An instrument is an instrument. It is impossible for me to change into another person after learning a language.	1	2	3	4	5
24.	For me, it is meaningless to talk about personal changes after learning English.	1	2	3	4	5

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