

GSL Research Series

Extending the Global Scale of English (GSE) to the Global Scale of Languages (GSL)

Part 3: Aligning Chinese Learning
Objectives to the GSL

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Executive Summary

The Global Scale of English (GSE) offers a detailed means of describing and assessing the progress and performance of English language learners. Pearson has conducted extensive research (see **Pearson**) in using the GSE Learning Objectives as the reference scale to extend the 2001 set of Common European Framework of Reference for Languages (CEFR) Can-do statements to address the needs of learners of languages other than English.

The purpose of this study was to validate whether Learning Objectives from the newly established Global Scale of Languages (GSL) are also applicable to adult learners of Chinese. 312 GSE Learning Objectives were translated into Chinese and 28 new objectives were added in order to represent Chinese-specific language aspects, primarily the recognition and understanding of Pinyin, Chinese characters and tones. A panel of 20 qualified raters drawn from a pool of Chinese teachers were invited to conduct 25 Comparative Judgement (CJ) comparisons per learning objective resulting in 8,500 data points.

A series of analyses, including rater and item fit statistics, were performed. Strong correlations were established among the Learning Objectives' CJ scores in European languages and English versions, as well as with the original GSE values. Further analysis on the combined Chinese CJ data validates the alignment of the GSL with the GSF.

1. Introducing the GSE and the GSL

The GSE is a standardised English proficiency scale which runs from 10 to 90 and is psychometrically aligned to the Common European Framework of Reference for Languages (CEFR, Council of Europe, 2001). A set of GSE Learning Objectives has been developed to describe learner proficiency at each point on the scale, incorporating and extending the CEFR descriptor set. These Learning Objectives have been rated by teachers of English as a Foreign Language (EFL) and calibrated against the Global Scale of English (de Jong, Mayor & Hayes, 2016). Unlike the CEFR and some other scales which describe attainment in broad levels, the Global Scale of English identifies what a learner can do at each point on the scale across speaking, listening, reading and writing skills, to provide a more detailed description of increasing language proficiency. The work to develop the GSE Learning Objectives builds upon and extends the research carried out by Brian North and the Council of Europe in creating the CEFR (North, 2000). The GSE Learning Objectives have been developed by Pearson over a number of years in collaboration with over 6,000 teachers, ELT authors and language experts from around the world.

The GSL was launched in September 2023 with the aim of making this extension of the GSE, and therefore the CEFR, available and relevant for teachers of other languages. A study was carried out for Spanish-as-a-Foreign-Language (Zheng, Doyle, Booth & Mayor, 2023a) which validated the alignment between the GSE values and the Spanish ratings of the same set of Learning Objectives. leading to the establishment of the Global Scale of Languages (GSL). A similar study was subsequently conducted and published on the same set of Learning Objectives in German, thus further supporting the findings of the first research (Zheng, Doyle, Booth & Mayor, 2023b).

2. Purpose of the Study

The findings of the Spanish and German studies mentioned above have consolidated the GSL for European languages. This study compares the rank order of Chinese translations of GSE Learning Objectives to verify whether the existing GSE values can be extended to a non-Indo-European language and, in consequence, provide a scale for adult learners of Mandarin Chinese.

The working hypothesis is: Given that the GSE is based on the CEFR, which is itself language-neutral, it is believed that the overall order of Learning Objectives will be highly correlated to both the GSE and CEFR, and this project sets out to verify this hypothesis using the Comparative Judgement approach.

Review of relevant Chinese language tests and scales

A review was conducted to help situate this study in the existing literature on relevant Chinese language tests and standards.

- 1. HSK (Hanyu Shuiping Kaoshi: Chinese Proficiency Test): This standardized test designed by the Chinese government serves as a benchmark for Chinese language proficiency for non-native speakers. Its levels range from HSK 1 (beginner) to HSK 6 (advanced), each corresponding to specific vocabulary and grammar skills. The test suites have expanded the levels up to HSK 9 in 2022.
- 2. TOCFL (Test of Chinese as a Foreign Language): It is a suite of CEFR-aligned tests developed in Taiwan, which provide assessment for reading and listening proficiency. It consists of Band A, Band B, and Band C, each with two levels that correspond to CEFR standards from A1 to C1.
- 3. CEFR (Common European Framework of Reference for Languages): Though developed in Europe for European languages, the CEFR is also used as a reference for Chinese language learners. It assesses language proficiency from A1 (beginner) to C2 (proficient).
- 4. ACTFL (American Council on the Teaching of Foreign Languages) Proficiency Guidelines: While originally developed for any language, these guidelines are also used for Mandarin Chinese. They describe language proficiency in terms of speaking, writing, listening, and reading at four levels: Novice, Intermediate, Advanced, and Superior.
- 5. EBCL (The European Benchmarks for the Chinese Language) project, supported by the EU, aimed to develop an independent proficiency scale for Chinese language learning, modelled on the principles of the CEFR. The project focused on aligning Chinese language education with European standards to facilitate comparability and integration into existing educational frameworks. The EBCL project produced descriptors for the Beginner levels in 2011.

6. The Chinese Proficiency Grading Standards for International Chinese Language Education (2021), developed by China's Ministry of Education, is a framework designed to standardize and assess the Chinese language proficiency of non-native speakers. It integrates linguistic competencies (listening, speaking, reading, writing, and translating) with intercultural communication skills. The framework consists of three levels (beginner, intermediate, advanced), subdivided into nine bands, providing detailed descriptions of language ability at each stage.

Based on the above review, changes were made in the descriptors used in the study. Some descriptors were added in from the EBCL report, together with considerations from The Chinese Proficiency Grading Standards for International Chinese Language Education. Grammatical features of Chinese were also taken into consideration while reviewing the descriptors for the Chinese language.

3. Methodology

3.1 Comparative Judgement and its Applications

Comparative judgement (CJ) involves holistic judgements of pairs of student work by a group of independent judges who determine which work has the greater specified global construct. The outcome is a binary decision matrix of the 'winner' and 'loser' of each pairing, which is then fitted to the Bradley-Terry model (Bradley & Terry, 1952) to produce parameter values (scores) and standard errors for each student work. The parameter value enables construction of a scaled rank order of the student work from 'best' to 'worst', which can be used for assessment purposes such as grading.

As well as its use in British examination boards to look at inter-board comparability, (e.g., Fearnley, 2000; Gray, 2000). comparability of standards over time and to maintain standards (e.g., Chambers & Cunningham, 2022), CJ has also been applied to a variety of educational contexts. This includes peer evaluation of undergraduate design thinking project reports (Mentzer et al., 2021), written tests on conceptual understanding of a mathematics course (Jones & Alcock, 2014), teacher evaluation of summative statistics and English assessments (Marshall et al., 2020), essays

(Steedle & Ferrara, 2016), and argumentative texts (Lesterhuis et al., 2022). Pearson employed CJ to align the Global Scale of English (GSE) Learning Objectives for Young Learners to the Chinese Scale of English proficiency (CSE) by comparing the difficulty of descriptors in each standard (Pearson, 2020).

The psychological basis for CJ is that humans are proficient at comparing one object against another but unreliable when rating objects in isolation (Gill & Bramley, 2013; Thurstone, 1927). Traditional analytical approaches involve teachers marking students' work individually in an absolute manner using rubrics, which can lead to different interpretations and applications of rubric descriptors. as well as the possibility of drawing on their perception of other students' work. In contrast, CJ minimises this comparative influence from detailed and specific rubrics (Pollitt, 2004). It harnesses the comparative aspect of assessment directly, dispensing with rubrics and marking. Previous literature has set out how CJ meets high standards of validity, reliability, and efficiency.

3.2 Design of the Study

NoMoreMarking (Wheadon, 2019), a CJ tool, was used to carry out this study. The number of times a given object is judged in comparison to another is an important element in a CJ study. Verhavert, et al. (2019) recommend having 10 to 30 comparisons per object to ensure acceptable reliability. In line with this recommendation, 25 comparisons per Learning Objective were collected to ensure a robust design.

In this study, we selected 320 GSE Learning Objectives for Adults, which represents 30% of the total number available. In terms of sample size and selection, 20% is generally the minimum overlap needed to align scales (Kolen & Brennan, 2004). The sample is stratified to be representative of both the number of Learning Objectives in each of the four skills as well as the number in each CFFR level (see Table 1 below)

Table 1: Learning Objective Distribution

CEFR/GSE	Listening	Reading	Speaking	Writing	TOTAL	% of database
Below A1 (10-21)	2	3	9	3	17	29%
A1 (22-29)	5	5	13	6	29	24%
A2 (30-35)	6	6	17	10	39	30%
A2+ (36-42)	6	6	16	10	38	27%
B1 (43-50)	7	7	18	11	43	35%
B1+ (51–58)	7	7	18	11	43	33%
B2 (59-66)	7	7	18	11	43	27%
B2+ (67–75)	5	5	14	8	32	27%
C1 (76-84)	3	3	10	3	19	26%
C2 (85-90)	1	1	4	3	9	47%
TOTAL	49	50	137	76	312	29%
% of database	26%	35%	28%	32%	29%	-
Other	3	5	6	14	28	_
GRAND TOTAL	52	55	143	90	340	-

3.3 Learning Objective Translations: English to Chinese

The initial batch of 320 GSE Learning Objectives was translated into Chinese by a translation agency with experience in translating educational materials. The translation process went through several stages:

- Glossary of key terms: translation by the agency
- Glossary of key terms: review by Pearson's in-house Chinese speaking staff
- First round translation by the agency
- Review and amends by a second translator within the agency
- · Review by Pearson in-house Chinese speaking staff
- Review by an external Chinese Subject Matter Expert, hired by Pearson.

In order to create a linking design with the Spanish and German alignment studies (Zheng et al., 2023a and 2023b), initially the same Learning Objectives were used in this study. However, some of them proved unsuited to the characteristics of the Chinese language and the way in which it is learnt. In consequence, the following changes were introduced to the set:

- 1. Eight GSE Learning Objectives were removed.
 - Listening:
 - Can recognise the letters of the English alphabet when pronounced.
 - Speaking:
 - o Can spell out their own name and address.
 - Can ask for the spelling of a word, or for a word to be written down.
 - o Can talk about possibilities in the past with precision.
 - Writing:
 - Can write consistently with joined-up letters.
 - Can use capital letters appropriately.
 - Can spell a range of common jobs.
 - o Can make jokes in writing using words with similar spelling but different meanings.
- 2. Three GSE Learning Objectives were adapted to create new versions which reflect the writing system of Chinese.
 - The Writing GSE Learning Objective Can spell a range of common jobs became Can write a range of common jobs.
 - The Writing GSE Learning Objective Can make jokes in writing using words with similar spelling but different meanings became a Speaking Learning Objective Can make jokes in speaking using homonymic characters.
 - The Writing GSE Learning Objective Can write dates using both digits and words was split into two so that one objective focuses on writing dates using Arabic numerals and the other on writing dates using Chinese characters.

To the total of 305 remaining Learning Objectives an additional 25 were introduced to the set across the four skills to include Chinesespecific language aspects: the recognition and understanding of Pinyin, Chinese characters and tones. Examples include (see Appendix 2 for the full list):

- Listenina:
 - Can identify the tones when pronounced.
- Speaking:
 - Can pronounce Pinyin, including tones accurately.
- Reading:
 - Can recognize the component parts of a Chinese character.
- Writina:
 - Can write down words and short sentences in Pinyin with mostly correct tone marks.
 - Can write dates using Chinese characters.

These were either taken from the European Benchmarks for the Chinese Language (EBCL, 15 in total) or created by a Chinese Subject Matter Expert (10 in total). Writing learning objectives constitute 48% of those additions, which indicates the necessity to provide detailed descriptors to cover a writing system differing from the Roman script used by the languages in the previous two studies. In total, 340 Learning Objectives in Chinese were used for the CJ rating exercise (see Table 1 for detailed breakdown across the four skills and CEFR levels).

3.4 Rater Selection

Raters were all experienced Chinese teachers. They were recruited from two pools:

- Senior examiners for the Pearson Edexcel GCSE and/or A-level Chinese qualification (secondary school/college qualifications in the UK)
- Teachers of Chinese in the UK, Austria and Hong Kong

114 people expressed interest in taking part in the research and provided background information. Based on their experience in teaching adult learners and their familiarity with the CEFR, the Hanyu Shuiping Kaoshi (HSK, Chinese Proficiency Test) and European Benchmarks for the Chinese Language (EBCL), 20 raters were selected for the project. Consideration was also given to creating a group of raters as diverse as possible in terms of gender, nationality, and experience (see Appendix 1 for the rater demographics).

The raters were provided with written instructions on the task and the platform before they were asked to conduct the comparative judgement based on this question: "Which of these Learning Objectives describes a more difficult skill for a language learner?"

3.5 Dataset Description

Table 2: Number of Learning Objectives and Comparisons for Each Skill

Skill	Chinese Learning Objectives	Total number of judgements
Listening	52	1300
Reading	55	1375
Speaking	143	3575
Writing	90	2250
TOTAL	340	8500

4. Results

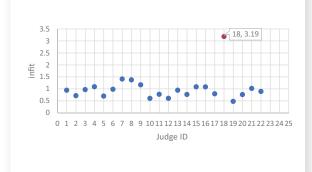
Reliability estimates for the four skills are all above 0.9, comparable to those from the two European languages (Spanish and German) in previous similar studies.

Table 3: Scale Separation Reliability

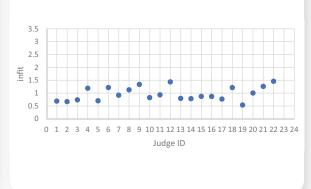
Listening	Reading	Speaking	Writing
0.94	0.93	0.94	0.94

4.1 Judge Infit Statistics

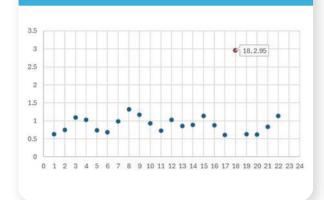




Chinese Reading: Judge Infit



Chinese Writing: Judge Infit



Chinese Speaking: Judge Infit



Infit statistics for Judge # 18 fell out of the threshold for Listening and Writing, and Judge #22 for Speaking. Their corresponding rating data were removed from further analysis.

4.2 Learning Objective Infit Statistics

The following sections report the Learning Objective infit statistics for the four skills. Figures 5-8 show the scatterplots for each skill with Y-axis indicating the item infit statistics and X-axis indicating the number of items. Learning Objectives with infit statistics outside the satisfactory range, i.e., above or below two standard deviations of the average infit statistics, are highlighted in the relevant Figures, with the first number indicating the Learning Objective sequence, and the second number indicating their respective infit statistics. As can be seen, one Learning Objective in Listening, three in Reading,

four in Speaking and six in Writing are highlighted as Learning Objectives with infit statistics outside the satisfactory boundary.

Tables 4-7 show the correlations among the CJ scores generated from the European versions of the Learning Objectives, as well as with the original Global Scale of English values. Satisfactory outcomes are obtained as demonstrated by the high correlations among these scores, ranging from 0.84 to 0.96.

4.2.1. Listening

Figure 5: Listening - Learning Objective Infit Statistics

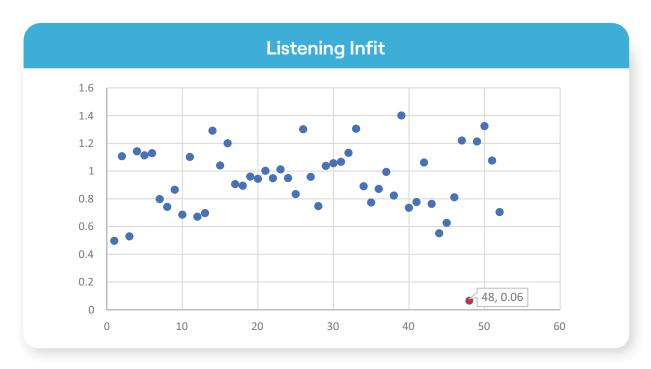


Table 4: Listening - Comparing CJ Estimates

	European Languages CJ	GSE	Chinese
European Languages	1		
GSE	0.96	1	
Chinese CJ	0.92	0.90	1

4.2.2. Reading

Figure 6: Reading - Learning Objective Infit Statistics

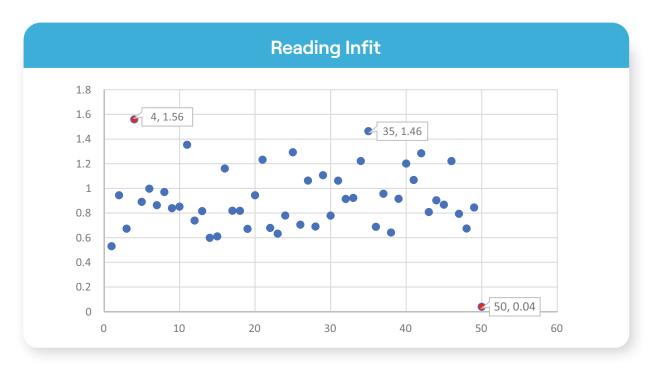


Table 5: Reading - Comparing CJ Estimates

	European Languages	GSE	Chinese
European Languages	1		
GSE	0.94	1	
Chinese	0.88	0.88	1

4.2.3. Writing

Figure 8: Writing - Learning Objective Infit Statistics

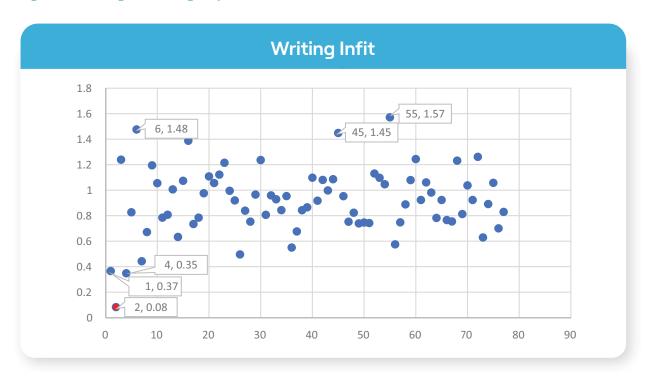


Table 6: Writing - Comparing CJ Estimates

	European Languages	GSE	Chinese
European Languages	1		
GSE	0.94	1	
Chinese	0.84	0.83	1

4.2.4. Speaking

Figure 7: Speaking - Learning Objective Infit Statistics

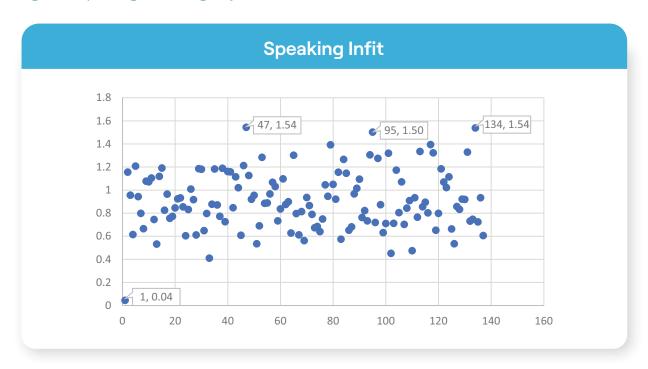


Table 7: Speaking - Comparing CJ Estimates

	European Languages	GSE	Chinese
European Languages	1		
GSE	0.94	1	
Chinese	0.90	0.91	1

Further investigation into the rating data shows that some misfit Learning Objectives overlap in different languages, for example "Can understand cardinal numbers from 1 to 20" is an outlier in the German data, as well as in the Chinese data. "Can understand very basic common classroom instructions." obtained a scale score of 0 in both the German and Chinese analyses. "Can understand the details of extended and linguistically complex talks on a range of political, environmental, and social issues." obtained a scale score of 100 in both the German and Chinese analyses. Table 8 shows the high correlations of the misfit Learning Objectives in different languages, indicating the potential ambiguity in Objectives themselves instead of the differences carried by the specific languages that convey those Learning Objectives.

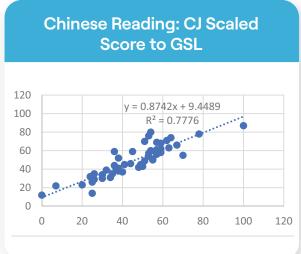
Table 8: Misfit Learning Objective correlations

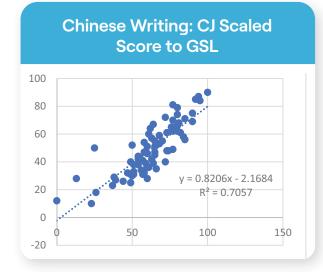
	German	Spanish	Chinese
German	1		
Spanish	0.96	1	
Chinese	0.93	0.93	1

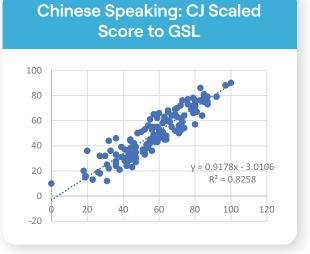
5. Converting Chinese Learning Objectives to the GSL

The four graphs below show the linear regression between the Chinese CJ scaled scores and the GSL.









Based on the satisfactory results obtained so far, transformation equations were generated for each language skill. Table 9 below shows the transformation equations to put Learning Objectives in Chinese on the GSL.

Table 9: Transformation Equation from CJ Estimates to GSL Values (X= CJ scaled score; Y=GSL)

Listening	Y = 0.8888X + 8.0316
Writing	Y = 0.8206X - 2.1684
Reading	Y = 0.8742X + 9.4489
Speaking	Y = 0.9178X - 3.0106

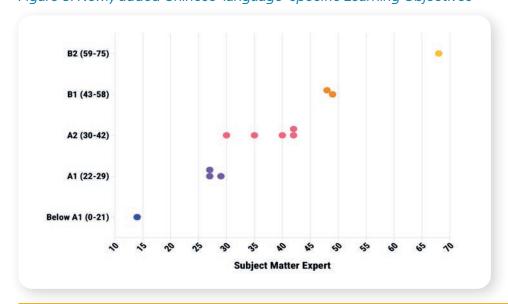
6. New Learning Objectives in Chinese

The 25 new Learning Objectives that were introduced to the set (see Appendix 2 for details) were calibrated alongside the common Learning Objectives. Among the 25, 12 were written by the Subject Matter Expert.

Figure 8 shows the mapping of the 12 newly added Chineselanguage-specific Learning Objectives on CEFR. These objectives extend from below A1 level to B2 level, thus expanding the European Benchmarks for the Chinese Language (EBCL) which covers up to A2 level.

Table 9 shows the correspondence between the newly added Learning Objectives, their scaled scores generated from the CJ exercise and their corresponding GSL scores.

Figure 8: Newly added Chinese-language-specific Learning Objectives



Further analysis was run to compare the calibration of the EBCL Learning Objectives. The figure below shows the estimated CEFR levels from EBCL and from this new calibration.

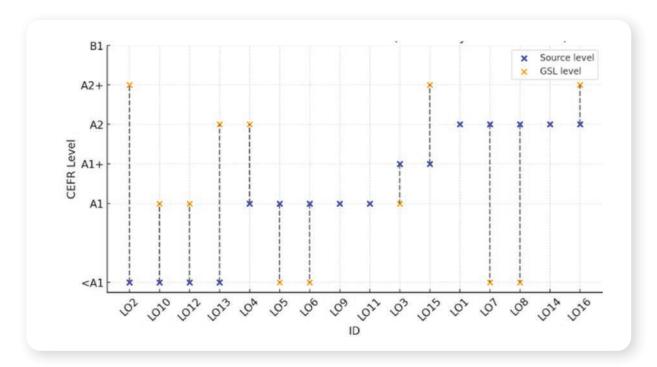


Figure 9: CEFR levels comparison for the EBCL Descriptors

Discrepancies were observed, especially in the following Learning Objectives:

- #L02: Can read and understand familiar words and sentences when written in Pinyin with tone marks.
- #LO13: Can write down words and short sentences in Pinyin with mostly correct tone marks.
- #L07: Can write down in Pinyin any Chinese word with correct tone marks after listening to its correct pronunciation.
- #L08: Can copy short phrases on everyday subjects by hand without hesitation - e.g. names of institutions.

It is not to be expected that all Learning Objectives will align, especially where different methodologies are used. The complexity of Chinese writing is well documented in the literature (Guder A., 2015). GSL and GSE Learning Objectives were primarily calibrated using teacher judgements so this may have impacted on the specific ratings they gave to writing Learning Objectives at the lowest levels of proficiency.

7. Conclusions

Based on the analyses reported above, a list of common Learning Objectives in Chinese were calibrated on the GSL and a list of newly added Chinese-language-specific Learning Objectives were also calibrated on the GSL. Learning Objectives from these two lists were compared to those in the GSL for European languages. In addition, comparisons were made to European Benchmarks for the Chinese Language for 15 Learning Objectives.

Convincing outcomes were obtained, which leads to the conclusion that, in general, Learning Objectives conveyed in Chinese could be put on the GSL, and the parameters are comparable to those in the GSL for European languages, with the exception of certain outliers. The investigation of the outliers indicates that the potential reason for some Learning Objectives to behave outside acceptable boundaries may be because of the nature of the Learning Objectives themselves rather than the languages that they are conveyed in. A fine-grained qualitative investigation may be required to further scrutinize the wording of those particular Learning Objectives and the contexts they may be used in.

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Appendix 1: Rater Demographics

Nationality	Count
Austrian	1
British	5
Chinese	11
Taiwanese	2
British/Taiwanese	1
Total	20

Gender	Count
Woman	16
Man	3
Prefer not to say	1
Total	20

Years teaching Chinese	Count
Less than 2 years	4
2-5 years	3
5-10 years	1
>10 years	12
Total	20

CEFR familiarity	Count
Haven't heard of it	1
Aware of it	3
Detailed knowledge	16
Total	20

HSK familiarity	Count
Haven't heard of it	0
Aware of it	1
Detailed knowledge	19
Total	20

EBCL familiarity	Count
Haven't heard of it	4
Aware of it	12
Detailed knowledge	4
Total	20

Other languages taught	*Count
English	12
Cantonese Chinese	1
German	1
Hindi	1
Korean	1
Spanish	1

^{*}Some participants had experience teaching more than one additional language. Seven participants did not have experience teaching other languages.

Age group(s) taught (Chinese)	Count		
Adults (18+)	20		
Upper Secondary/college/6th form (15-19)	10		
Lower Secondary (12-15)	9		
Upper Primary (9-12)	6		
Lower Primary (6-9)	3		
Pre-primary (3-5)	0		

Appendix 2: New Learning Objectives on the GSL

Learning Objective	SOURCE	SOURCE LEVEL (CEFR)	SKILL	GSL	GSL on CEFR
Can recognise the Pinyin symbols/ letters when pronounced.	SME		Listening	16	<a1< td=""></a1<>
Can identify the tones when pronounced.	SME		Listening	26	A1
Can recognise the Pinyin combinations of initials and finals.	SME		Listening	30	A2
Can identify the border of a word in Chinese in a sentence.	SME		Reading	33	A2
Can read and understand short Pinyin sentences on everyday subjects or in grammar model sentences.	EBCL	A2	Reading	35	A2
Can read and understand familiar words and sentences when written in Pinyin with tone marks.	EBCL	<a1< td=""><td>Reading</td><td>36</td><td>A2+</td></a1<>	Reading	36	A2+
Can recognize the component parts of a Chinese character.	SME		Reading	36	A2+
Can make references of the meaning of a unfamiliar character, using meaning radical as a clue.	SME		Reading	46	B1
Can pronounce Pinyin, including tones, accurately.	SME		Speaking	24	A1
Can read out any Pinyin syllable with correct pronunciation.	EBCL	A1+	Speaking	25	A1
Can ask for the writing of a character.	SME		Speaking	26	A1
Can explain the characters and the meaning of their own name.	SME		Speaking	37	A2+
Can pronounce tone sadhi, neutral tone correctly.	SME		Speaking	43	B1
Can make jokes in speaking using homonymic characters.	SME		Speaking	68	B2+
Can write a range of common jobs.	SME / GSE	A1	Writing	38	A2
Can write dates using Chinese characters.	SME		Writing	16	<a1< td=""></a1<>

Learning Objective	SOURCE	SOURCE LEVEL (CEFR)	SKILL	GSL	GSL on CEFR
Can copy familiar words and characters as well as unfamiliar characters in simple signs or names.	EBCL	A1	Writing	19	<a1< td=""></a1<>
Can write down his/her gender, nationality and any date (like one's birthday) by hand.	EBCL	A1	Writing	19	<a1< td=""></a1<>
Can write down in Pinyin any Chinese word with correct tone marks after listening to its correct pronunciation.	EBCL	A2	Writing	19	<a1< td=""></a1<>
Can copy short phrases on everyday subjects by hand without hesitation - e.g. names of institutions.	EBCL	A2	Writing	21	<a1< td=""></a1<>
Can write Chinese characters with the help of electronic devices.	EBCL	A1	Writing	23	A1
Can write down any character by hand after slow visual instruction (stroke by stroke).	EBCL	<a1< td=""><td>Writing</td><td>24</td><td>A1</td></a1<>	Writing	24	A1
Can write down most syllables in Pinyin including tone marks with reasonable accuracy if they are pronounced correctly.	EBCL	A1	Writing	28	A1
Can write down any lexical item or short phrase by hand after slow visual instruction (stroke by stroke).	EBCL	<a1< td=""><td>Writing</td><td>29</td><td>A1</td></a1<>	Writing	29	A1
Can write down words and short sentences in Pinyin with mostly correct tone marks.	EBCL	<a1< td=""><td>Writing</td><td>35</td><td>A2</td></a1<>	Writing	35	A2
Can write short sentences with standardized grammar in Pinyin on familiar topics.	EBCL	A2	Writing	35	A2
Can type characters and sentences with a computer using the Pinyin input method.	EBCL	A1+	Writing	38	A2+
Can write by hand with reasonable graphemic accuracy so that the written characters are understood by other readers or by an OCR device.	EBCL	A2	Writing	39	A2+



