Using Sentence Translation to Assess Bilingual Proficiency of Bhutanese ESL Learners

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Authors' contributions

This work was carried out in collaboration among all authors. Authors TOT and DC designed the study, performed the task and wrote the first draft of the manuscript. Authors CT and SWT managed the analysis of the story and literature searches. All authors read and approved the final manuscript.

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ABSTRACT

This study examined translation behaviours of adult Bhutanese learners of English as a second language (L2) to assess their level of bilingual proficiency. The study used a questionnaire on bilingual profile to first determine the participant's history, attitude, preferences and proficiency of both the participant's first language (Dzongkha) and their second language (English). In the main task, the participants were presented with English active and passive sentences that were either plausible or implausible and asked to translate them into Dzongkha. In the second task, the direction of translation was reversed, and participants were asked to translate from Dzongkha to English. The results indicated a relatively equal performance in both translation tasks, suggesting balanced bilingualism among the participants. Results of both tasks showed a high level of

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accuracy in terms of active plausible sentences and a low number for passive implausible sentences translation, implying that the participants found it challenging to translate sentences when syntactic input conflicted with semantic knowledge. The participant's tendency to perform literal translation of implausible sentences, rather than rejecting semantically implausible sentences indicated a moderate level of balanced bilinguality. Additionally, the participant's ability to translate implausible sentences with correct syntactic structure implies that, like native speakers, these adult second language learners have access to both syntactic as well as semantic routes during sentence processing.

1. INTRODUCTION

Bilingual education is a broad term that encompasses a variety of educational programs that use two or more languages to varying degrees. Cummins (2008) defines it as the use of two or more languages for instructional purposes at some point in a student's educational journey, while Gracia [1] refers to it as the use of two or more languages in the instruction and assessment of learners. Despite these definitional nuances, it is imperative to acknowledge that bilingual education is not a new concept within language pedagogy, dating back thousand of years (Mackey, 1978) as cited in Gracia, [2]. Despite its historical prevalence, the implementation of bilingual education programs vary in goals, language use, and are shaped by the sociocultural and historical context.

Early research in the United States favored monolingualism, suggesting bilingualism hindered cognitive development, while Canadian studies highlighted its benefits, demonstrating improved cognitive abilities among bilingual individuals [3,4]. Subsequent research by Bain and Yu (1982) and Hakuta and Diaz (1984) supported the positive effects of bilingualism, leading to the adoption of pedagogies promoting the use of second languages in educational settings. Today, there are a variety of bilingual education programs available, ranging from immersion to dual language programs. These programs vary in their goals, language use, and the amount of time students spend learning each language. The decision of when and how to use L1 in bilingual education is a complex one that should be made on a case-by-case basis, taking into account the needs of the students, the goals of the program, and the sociocultural context.

The aim of the study was to assess the bilingualism and proficiency levels of adult Bhutanese learners in their native language (L1 - Dzongkha) and second language (L2 - English) as well as gather evidence on their attitudes towards the two languages within Bhutan's multilingual educational context.

The next section provides an overview of bilingual education and the use of L1 in global instructions and specifically in Bhutan, where the present study is uniquely situated.

2 LITERATURE REVIEW

Bilingual education has been extensively discussed by Cummins and Swain [5], emphasizing theory, research, and practice in fostering bilingual proficiency. García [2] extends this discourse by offering a global perspective on bilingual education in the 21st century, highlighting diverse linguistic landscapes and educational challenges faced by bilingual learners worldwide.

The traditional approach to bilingual education often prioritizes the exclusion of the learner's first language (L1) to promote proficiency in the second language (L2) [6]. This is evident in methods like the Direct method, Audio-lingual method, and Communicative language teaching, advocating for the predominant use of the target language while discouraging L1 incorporation. This approach stems from the belief in language compartmentalization, exemplified by Cummins' Separate Underlying Proficiency Model of Bilingualism (SUP) [7], which suggests that L1 and L2 operate independently. Despite its prevalence, the SUP model lacks robust empirical support, yet it continues to influence contemporary bilingual education programs. In contrast, Cummins' interdependence hypothesis proposes leveraging both languages concurrently to enhance proficiency in L2 [7], supported by the Common Underlying Proficiency (CUP) model, which suggests a shared underlying proficiency across languages.

Cummins [7] underscores the benefits of bilingual instructional strategies that leverage learners' bilingual linguistic resources, advocating for integration of translation and code-switching. Gracia [2] similarly argues against the strict separation of languages, emphasizing the empowerment of bilingual learners through acknowledging translation and code-switching as integral aspects of their linguistic adeptness. As such, educators must acknowledge translation and code-switching as an integral aspect of the distinctive linguistic adeptness exhibited by bilingual individuals that not only mirrors the intricate multilingual reality but also empowers bilingual learners with a more comprehensive linguistic arsenal.

Early studies, such as those by Peal and Lambert [4], which examined the relationship between bilingualism and intelligence, found that bilingual individuals often exhibited cognitive advantages, challenging the notion that bilingualism might impede intellectual development. Contemporary research has built upon these findings, offering nuanced insights into the cognitive benefits of bilingualism. For example, Green [8] investigated the neural correlates of language control in bilinguals, while Luk, Bialystok, and Craik [9] examined the cognitive benefits of bilingualism across the lifespan.

Empirical research in bilingualism has often been conducted by investigating translation behaviour. Recent research underscores translation's efficacy as an instructional tool for L2 education. Within the realm of bilingualism, translation assumes a significant role as a cognitive and linguistic process employed by L2 speakers to navigate two languages.It offers insights into the intricate cognitive and linguistic transformations occurring within the learner's cognition. Unfortunately, these nuances are often overlooked in discussions concerning the cognitive processing of syntax, morphology, and pragmatics within the learner's mind. The significance of translation in bilingual behavior has been explored, with studies by Seleskovitch (1976), Danks and Griffin (1997), and Macizzo and Bajo (2004) highlighting its role as a cognitive and linguistic process employed by L2 speakers. These inquiries suggest that translated output can serve as a diagnostic tool, revealing learners' comprehension challenges. Further, Kroll and Steward (1994) propose that translation from L1 to L2 benefits from the stronger L1-concept linkage, potentially enhancing comprehension, while accurate translation from L2 to L1 indicates the learner's recognition and comprehension of L2 input, affirming translation's role in measuring learner comprehension during sentence processing.

Recent studies have delved deeper into the cognitive and neural mechanisms involved in bilingual language representation and processing. For instance, Ferreira, Bailey, and Ferraro [10] explored "good-enough" representations in language comprehension, shedding light on how bilinguals efficiently process language despite potential ambiguities. Further investigations into sentence processing by Ferreira et al. [11] and Lim and Christianson [12] have elucidated the interplay between syntax and semantics in language processing. Additionally, Clahsen and Felser [13] provided valuable insights into the continuity and shallow structures involved in language processing. Other research have continued to explore the cognitive mechanisms underlying bilingual language representation and processing. For example, Ferreira [11] investigated the misinterpretation of noncanonical sentences, while Hatzidaki, Pothos, and Emmanuel [14] examined bilingual language representation and cognitive processes in translation.

In contrast to first language (L1) acquisition, acquiring native-like fluency in a second language (L2) by adult learners is widely considered challenging, with conflicting viewpoints regarding L2 processing compared to L1. One perspective is the Good-enough language processing (GE) framework, positing two concurrent pathways: a syntactically-driven algorithmic route and a semantics-based heuristic route. This framework underscores the interplay between syntax and semantics in language processing, as evidenced by studies such as Ferreira et al.'s [15] investigation into implausible passive sentences. Another perspective is the Shallow Structure Hypothesis (SSH), suggesting that non-native language processing relies more on semantic cues than syntactic information. While some studies support this view, others, such as those by Lim and Christianson [12], suggest that L2 processing may mirror native language processing. Their research on Korean learners of English highlighted the parallelism between L2 and L1 processing, supporting the 'good-enough' framework [16].

2.1 Aim of the Study

The present inquiry seeks to analyse the status of bilingual education in Bhutan, specifically focusing on the educational context of Bhutanese learners proficient in Dzongkha. Despite the predominant use of English as the medium of instruction in Bhutanese schools, juxtaposed with the prevalence of Dzongkha as the primary language among the majority of students, there is a dearth of comprehensive research in this domain. Within the Bhutanese educational framework, a clear demarcation can be seen between English and Dzongkha [17,18]. While minimal translation from the learner's native language (L1 - Dzongkha) to the second language (L2 - English) is permissible at lower grade levels, this practice is rare and discouraged as students progress to higher grades. Additionally, students are encouraged to speak either English or Dzongkha, and the use of code-switching and code-mixing is discouraged. Such practices are often viewed as indicative of a lack of competence in both languages. Teachers in Bhutan may even prohibit the use of Dzongkha in an English classroom or vice versa. This approach suggests that Bhutan has adopted the monolingual approach to language teaching based on Cummins' [7] SUP model of bilingualism, which is often criticised for being unrealistic and for not taking into account the dynamic nature of bilingualism.

The research was conducted with the purpose of evaluating the levels of bilingualism and proficiency among adult Bhutanese learners of English in their native language (L1 - Dzongkha) and second language (L2 - English) [19]. It also sought to gather evidence on the functioning of Bhutanese adult learners' CUP, their relative proficiency in L1 and L2, and their attitudes towards the two languages. This assessment of the degree of learners' bilingualism serves as a valuable tool for classroom evaluation, providing teachers with important information about students' language abilities. Such information allows the teachers to tailor the curriculum, thereby fostering the concurrent acquisition of both languages within the classroom environment [20].

Recent research on bilingual sentence processing has strived to illuminate how bilinguals conceptualise, process, and decipher multiple languages in their mind. Building on the researchers such as Ferreira et al. [11] and Lim and Christianson [12], the present study sought to extend these insights by examining Bhutanese bilingual speakers proficient in both English and Dzongkha. The present study sought to determine if Bhutanese bilingual speakers process language in a way similar to monolingual speakers. To this end, the investigation delved into the participants' cognitive processing of active and passive sentence structures, exploring potential disparities between the two language processing frameworks. Moreover, the study aimed to decipher the influence of plausibility and implausibility on the participants' capacity to comprehend active and passive sentences. Drawing from contemporary bilingualism research, the primary focus of the study was to empirically test the hypothesis that bilingual learners process sentences in a manner similar to their monolingual counterparts, utilising both a heuristic and syntactic parsing mechanisms, within the good-enough framework.

3. METHODS

The use of translation exercises in a L2 classroom has the potential to elicit responses from learners that provide insights into their shared underlying proficiency. This study delves into the benefits of incorporating translation tasks to examine the degree of bilinguality in learners. The focus of this investigation centres on translation behaviour of adult Bhutanese ESL learners. The study design was adapted from Ferrira et al. [11] and Lim and Christianson [12].

3.1 Research Questions

In the study, we attempted to answer the following research questions:

1. Do ESL learners show equal accuracy in translating plausible and implausible sentences in active and passive voice?
2. Are their translation behaviours the same in L1 and L2?
3. Are their attitudes towards L1 and L2 similar?
4. Does performance on translation tasks help assess the degree of bilinguality of learners?

3.2 Participants

This study parallels the research conducted by Lim and Christianson [12], but it focuses on a group of ten Bhutanese individuals proficient in

both English and Dzongkha. These participants completed their secondary education in Bhutan and were granted government scholarships to pursue Bachelors of Science in Geology at Osmania University in Hyderabad. It is important to note that these participants have had at least thirteen years of education, providing them a solid foundation in both languages. The scholarships were awarded based on their performance in Grade 12 with marked weightage given to both English and Dzongkha marks, highlighting their strong language skills in comparison to other students in the country.

The study also considers the participants' native languages. Despite having various first languages, such as *Tsangla*, *Lhotsamkha*, and *Bumthangkha*, they are essentially multilingual rather than strictly bilingual. However, the research focuses solely on their ability to process sentences in English and Dzongkha. This focus stems from the pivotal role the two languages play in Bhutanese education. Dzongkha is the country's national language and the official language for official correspondence, while English is compulsory in Bhutanese schools from an early age and serves as the medium for most subjects. This means the participants can both read and write in both the languages. This contrasts with the participants' first languages,

which remain spoken with no literacy. In light of these considerations, for the purpose of this study, Dzongkha is classified as the participants' first language (L1), while English assumes the role of their second language (L2).

3.3 Tools and Task used

The study employed a bilingual profile questionnaire to assess participants' attitudes and relative usage of their two languages (L1 and L2), focusing on their degree of bilingualism. Additionally, a translation task from Ferreira [11] for both Dzongkha (L1) and English (L2). Was adapted. Presented below are detailed descriptions of these two tools and tasks.

3.3.1 Bilingual profile questionnaire

The participants were required to complete a bilingual profile questionnaire. This questionnaire aimed to explore their language history, proficiency levels, language preferences, and overall perceptions of the two languages. Each question had corresponding versions in both L1 and L2. Responses were rated on a Likert scale ranging from 1 to 5. Participants were instructed to indicate their associatedness on each aspect using this scale. For illustration, a sample question used in the questionnaire is provided:

IV. Language Proficiency
In this action, we would like you to rate your language proficiency by giving marks from 0 to 5.
1=not well at all   5=very well

23. A. I feel like myself when I speak English.	1. 2. 3. 4. 5
B. I feel like myself when I speak Dzongkha.	1. 2. 3. 4. 5

3.3.2 Translation tasks

In the main translation task, sentences identical to those used in Ferreira's [11] study was employed. However, the original sentences was divided into two distinct sets: Set A and Set B. Each set comprised 12 sentences. These sets were then randomised, ensuring that each set incorporated 12 sentences distributed across four categories: active-plausible, passive-plausible, active-implausible, and passive-implausible. The sentences were meticulously arranged so that every participant encountered three sets of both active and passive sentences, each in plausible and implausible scenarios. Notably, each participant was exposed to only one version of each sentence throughout the task. To maintain consistency, three short locative sentences (consisting of approximately 5-10 words) were included as fillers. A sample of the locative sentences employed in the task is provided for reference:

SET A
The car is in the garage.
The cups are in the cupboard.
The chair is near the door

In essence, each set encompassed a total of 15 sentences, comprising the original 12 sentences categorised across four different contexts and three filler sentences. These sets predominantly contained sentences featuring transitive verbs with direct objects. In Set A, participants were presented with sentences in their L2 (English). They were instructed to read the sentences in English and translate them into their L1 (Dzongkha). Thus, Set A involved translating a total of 15 active and passive sentences from English (L2) into Dzongkha (L1), inclusive of the filler sentences. Given below is a set of sample sentences from the task:

Set A	
a) The dog bit the man.	(active-plausible)
b) The doctor was sued by the lawyer.	(passive-plausible)
c) The student quizzed the teacher.	(active-implausible)
d) The owner was fed by the cat.	(passive-implausible)

For the subsequent task, participants were assigned Set B, which consisted of a different group of 12 active and passive sentences presented in either plausible or implausible contexts, similar to the approach taken from Ferreira [11]. As with Set A, this set also incorporated three different filler sentences. The key distinction was that the inputs were now provided in participants' L1 (Dzongkha). Participants were required to read the sentences in Dzongkha and translate them into their L2 (English). Consequently, participants translated a total of 30 sentences: 15 sentences from English (L2) to Dzongkha (L1), and 15 sentences from Dzongkha (L1) to English (L2).

By employing these two distinct sets, each encompassing different input languages, we were able to delve into participants' translation behaviours in both the languages. This approach facilitated a comprehensive examination of how participants navigated translation between the two languages.

3.4 Task Administration

The participants were administered the profile questionnaire on the first day of data collection. Following a two-day interval, participants were assigned the translation task in one language, followed by the task in the second language. Each participant individually engaged with the sentence translation task at their own pace and subsequently submitted their completed tasks to the researchers.

3.5 Method of Data Analyses

The questions in the bilingual profile questionnaire were subjected to analysis based on the percentage of affirmative responses. The mean score was computed for each learner and subsequently for the entire group. For the translation task, the sentences were evaluated according to the following criteria:

a. active or passive plausible sentence translation: accurate = 2; acceptable with few changes = 1; and inaccurate = 0

b. active or passive implausible sentence translation: no translation = 2; changed sentence to plausible in translation = 1; literal translation = 0

Accuracy scores were derived as the mean value per participant and then for the entire group. Additionally, Spearman's Rho was employed to establish correlations between profile scores and translation performance for the fourth research question.

4. RESULTS AND DISCUSSION

This following section will focus on the analysis and discussion of learners' bilingual profiles, encompassing their responses and performance in the translation tasks.

4.1 Participants' attitude towards L1 and L2

The table shows the overall score indicated by the learners for each category:

Table 1. Learners' overall knowledge about the languages

Categories	Dzongkha (L1)	English (L2)
Language History	76.92	63
Language Use	52.5	47
Language Proficiency	66	65
Language Preference	68.57	78.57
Language Attitudes	78	68
Total	58.43	52.47

The overall scores for each category presented in Table 1, depicts a range between 47% and 79% for the ten participants. In both English (L2) and Dzongkha (L1), the total scores across categories were comparable: 52.47% for English and 58.43% for Dzongkha. Notably, participants scored higher (76.92%) in their L1 concerning language history compared to their L2 (63%), indicating a stronger foundation in their L1. Despite this, language proficiency scores (65 for English and 66 for Dzongkha) suggested balanced bilingualism, irrespective of their L1 background. An interesting divergence emerged in language preference, with participants showing a preference for their L2 (78.57%) over their L1 (68.57%), while displaying a more favourable attitude toward their L1. Additionally, participants favoured using their L1 slightly more (52.5%) than their L2 (47%) in their language usage.

4.2 Task Performance

This section delves into participants' performance in the two distinct sets of translation tasks.

4.2.1 Overall performance in L1 and L2

The table below presents the overall performance in both L1 to L2 and L2 to L1 translation tasks:

Table 2. Overall performance in translation tasks

Total	L1 - L2 Translation	L2 – L1 Translation
Total (240)	70	65
Total in %	29.17	27.08

The data table illustrates that participants exhibited higher accuracy when translating from L1 (Dzongkha) to L2 (English). Specifically, the scores indicate 70 (29.17%) for L1-L2 translation and 65 (27.08%) for L2-L1 translation. This implies a slight proficiency advantage in L1-L2 translation.

Across both translation tasks, an average accuracy of 28% emerges, reflecting a relatively low performance level. This outcome prompts consideration of potential factors, including (i) task unfamiliarity or (ii) task difficulty. If unfamiliarity with the procedure contributed to the challenge faced by learners, it underscores a limitation in the study's design. However, it is important to acknowledge that the absence of direct feedback from participants on their task experience limits our assertion. Alternatively, task difficulty could explain the lower performance, yet an assessment of the chosen sentences' types, tokens, and structural complexity suggests that they should not have posed an undue challenge for the participants. For a comprehensive understanding of this lower task performance, an analysis of performance across the four sentence types is explored in the subsequent section.

4.2.2 Performance in translating plausible and implausible sentences in active and passive voice

Table 3 provides scores for accurately translated sentences across four conditions: active-plausible, passive-plausible, active-implausible, and passive-implausible.

Table 3. Performance in four task conditions

Condition	L1 - L2 Translation (% scores)	L2 – L1 Translation (% scores)
Active Plausible	60	46.67
Passive Plausible	45	45
Active - Implausible	3.3	5
Passive - Implausible	8.3	11.67

Notably, translation ease is found under L1 to L2 conditions, as indicated in Table 3. Moreover, the performance with plausible sentences stands at a relatively higher 50% accuracy, in contrast to a meagre 7% accuracy in the implausible sentence context —underscored by a disparity between plausible and implausible sentence translation behaviour. This discrepancy highlights the translation behaviour: plausible sentences attain 50% accuracy, surpassing the overall 28% accuracy in the tasks (refer to Table 2).

From the Table, it can be seen that the proportion of correct translation was far greater for active sentences than for passive sentences. In L2 active-plausible sentence translation, participants are 60% more accurate compared to 45% in passive-plausible sentence translations. Conversely, the translation of L2 to L1 active and passive sentences reveals minimal score differences—46.67% in active plausible and 45%

in passive plausible sentences. This suggests participants encountered less difficulty translating active plausible sentences from L1 to L2 compared to L2 to L1. The stark contrast between active-plausible and active-implausible L2 sentences is striking, showcasing an almost 57% difference (60% and. 3.3%). Similarly, a considerable disparity is evident between passive-plausible and passive-implausible sentences in both translation tasks. While passive-plausible sentences yield a 45% accuracy rate, passive-implausible sentences experience a notable drop to 8.3%.

The results highlight participants' challenges with implausible conditions in both translation tasks, revealing the influence of semantic implausibility on syntactic representation, thereby causing translation difficulty. This substantial contrast between plausible and implausible sentence translation behaviour aligns with findings by Ferreira [11] and Lim and Christianson [12], emphasising a propensity for mistranslating implausible sentences compared to straightforward plausible ones. Furthermore, the data indicates that Bhutanese learners exhibit slightly more ease translating from their L1 (Dzongkha) to L2 (English) than vice versa. This is congruent with Kroll and Stewart's (1994) proposition that comprehension is smoother when translating from the learner's L1 to L2, owing to stronger connections between L1 and concepts in the participant's mind. The findings corroborate this idea, indicating a stronger link between concepts and the learner's L1, facilitating comprehension and contributing to a slightly higher number of accurate L1-L2 translations. Any errors in L2 translations could be attributed to the participants' difficulties in L2 grammar or lexicon challenges. Conversely, translating from the learner's L2 (English) to their L1 (Dzongkha) presents difficulties, possibly due to comprehension challenges in their L2. Despite their L1 lexical and morphosyntax knowledge, participants encountered challenges in translating sentences from L2 to L1, resulting in slightly higher numbers of errors. However, the distinction between L1-L2 and L2-L1 translation is marginal, less than 2%, indicating a consistent level of difficulty across both directions. This suggests participants' balanced proficiency in both languages.

While participants' balance in both languages is evident, the degree of binguality is discerned through their performance in translating implausible sentences. The findings underscore a lower score for implausible sentence translation compared to plausible sentences, consistent across both languages. This is indicative of a moderate level of bilingualism among participants. Given the prevalence of literal translations for semantically improbable sentences (95% for L1-L2 and 92% for L2-L1), participants seem unable to reject sentences based on implausibility, suggesting a moderate level of binguality. This implies that the participants treated the task primarily as a translation exercise, without prioritising semantic plausibility. The performance of the learners on the translation task enables us to ascertain that the participants are moderately balanced bilinguals. With a higher degree of bilingualism, they would have been capable of rejecting implausible sentences.

Additionally, it is noteworthy that while most participants provided literal translations, they maintained the morphosyntactic structure of the original sentences. This observation offers explicit evidence of participants' access to the syntactic route during L2 sentence processing. Contrary to the Shallow Structure Hypothesis, which posits adult L2 learners underuse syntactic structures due to 'less detailed' syntactic representations, this study's findings align with Lim and Christianson [12], suggesting that L2 processing is not inherently 'shallow' from a syntactic perspective. Furthermore, when translating passive sentences in both L2-L1 and L1-L2 contexts, participants typically maintained the sentence's meaning while opting to alter passive structures to canonical active forms. This pattern indicates that participants comprehended the input but exhibited less experience constructing passive sentences in both their L1 (Dzongkha) and L2 (English). Consequently, translated output predominantly featured active forms. This underscores potential limitations in participants' passive construction skills across both languages, suggesting a need for more focused classroom exercises to enhance their passive construction proficiency.

A limitation of this study is that it did not consider individual proficiency levels in the two languages. While the bilingual profile questionnaire included self-rated proficiency, no actual proficiency tests were conducted. Assessing learners' proficiency would have clarified how syntax and plausible information were influenced by proficiency during translation. Further, a single translation task that focuses may not be able comprehensively

reflect the participants' overall translation competency. Further exploration could involve analysing learners' translated output errors, differentiating between lexical and morphosyntactic errors.

4. CONCLUSION

In conclusion, the study's findings reveal that participants exhibit a stronger affinity towards their L1 (Dzongkha) in terms of attitude, yet their preference leans towards L2 (English). Their enhanced ease in translating active plausible sentences relative to passive implausible ones aligns with prior bilingual research, indicating that adult second language learners possess access to both syntactic and semantic processing routes during sentence comprehension. The participants' comparable performance in translation tasks from L1 to L2 and vice versa corroborates their balanced bilingual profile, affirming a moderate level of bilingualism. While higher levels of bilinguality might provide richer insights into the impact of plausibility on translation behaviour, participants' inability to reject semantically implausible sentences show that the learners are yet to achieve it.

CONSENT

As per international standard or university standard, all participants 'written consent was sought, collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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