Data-Driven *Text Adaptation* for Academic Reading Materials

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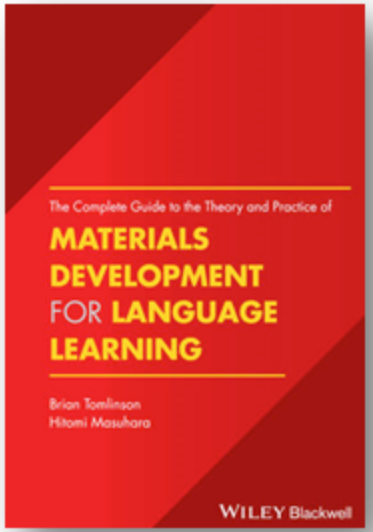
Text Adaptation

Adaptation



"Materials adaptation is a general term for the process that involves ***making changes*** to existing materials to ***better suit*** specific learners, teachers and contexts for the purpose of facilitating effective learning."

Tomlinson, B., & Masuhara, H. (2018). *The complete guide to the theory and practice of materials development for language learning*. Hoboken, NJ: Wiley-Blackwell.

Text Adaptation in our context

is to help teachers to make necessary ***linguistic adaptation*** to authentic texts of academic English reading to ensure the ***text complexity*** is suitable for learners at **expected proficiency levels**

Jin, T., & Lu, X. (2018). A data-driven approach to text adaptation in teaching material preparation: Design, implementation and teacher professional development. *TESOL Quarterly*, *52*(2), 457-467.

Outline

Part I text complexity

Concept 1 *Complexity Indices*

Part II linguistic adaptation

Concept 2 *Lexical Profiles*

Concept 3 *Syntactic Profiles*

Concept 1
Complexity Indices

Project 1

Matching Text

- The text, **Case A**, is selected from *Science*.
- Can you **match** **Case A** to ***proficiency levels*** of Chinese EFL learners in terms of text complexity?
- Please share with us the level you matched, as well as **your reasons** for doing so.

Case A

Autonomous Vehicles

REPORTS | SOCIOLOGY

The social dilemma of autonomous vehicles

Jean-François Bonnefon[1], Azim Shariff[2,*], Iyad Rahwan[3,†]
+ See all authors and affiliations

Science 24 Jun 2016:
Vol. 352, Issue 6293, pp. 1573-1576
DOI: 10.1126/science.aaf2654

Codes of conduct in autonomous vehicles

When it becomes possible to program decision-making based on moral principles into machines, will self-interest or the public good predominate? In a series of surveys, Bonnefon *et al.* found that even though participants approve of autonomous vehicles that might sacrifice passengers to save others, respondents would prefer not to ride in such vehicles (see the Perspective by Greene). Respondents would also not approve regulations mandating self-sacrifice, and such regulations would make them less willing to buy an autonomous vehicle.

Science, this issue p. **1573**; see also p. **1514**

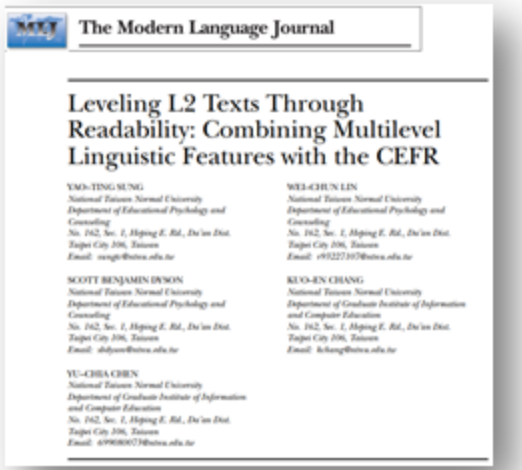
Matching Text

Chinese EFL learners (typical stages)	roughly equivalent to CEFR	tick the level you match for Case A
primary graduate	A2	
junior secondary	A2+	
senior secondary	B1	
collegiate basic	B2	
collegiate intermediate	B2+	
collegiate advanced	C1	

Project 1

Matching Text

The Leveling Issue



The Modern Language Journal

Leveling L2 Texts Through Readability: Combining Multilevel Linguistic Features with the CEFR

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Matching texts to particular proficiency levels is ***challenging***, even for experienced teachers

Sung, Y. T., Lin, W. C., Dyson, S. B., Chang, K. E., & Chen, Y. C. (2015). Leveling L2 texts through readability: Combining multilevel linguistic features with the CEFR. *Modern Language Journal, 99*, 371–391.

Data-Driven Measures

With the advent of corpus techniques, ***numerous data-driven measures*** are now available for characterizing text complexity

Jin, T., & Lu, X. (2018). A data-driven approach to text adaptation in teaching material preparation: Design, implementation and teacher professional development. *TESOL Quarterly*, *52*(2), 457-467.

Educational Researcher

Coh-Metrix

Providing Multilevel Analyses of Text Characteristics

Arthur C. Graesser, Danielle S. McNamara, Jonna M. Kulikowich,

First Published June 1, 2011 | Research Article | Check for updates
https://doi.org/10.3102/0013189X11413260

Article information

Article Information

Volume: 40 issue: 5, page(s): 223-234
Article first published online: June 1, 2011; Issue published: June 1, 2011
Received: April 01, 2011; Revisions received: May 06, 2011; Accepted: May 08, 2011

Complexity Indices

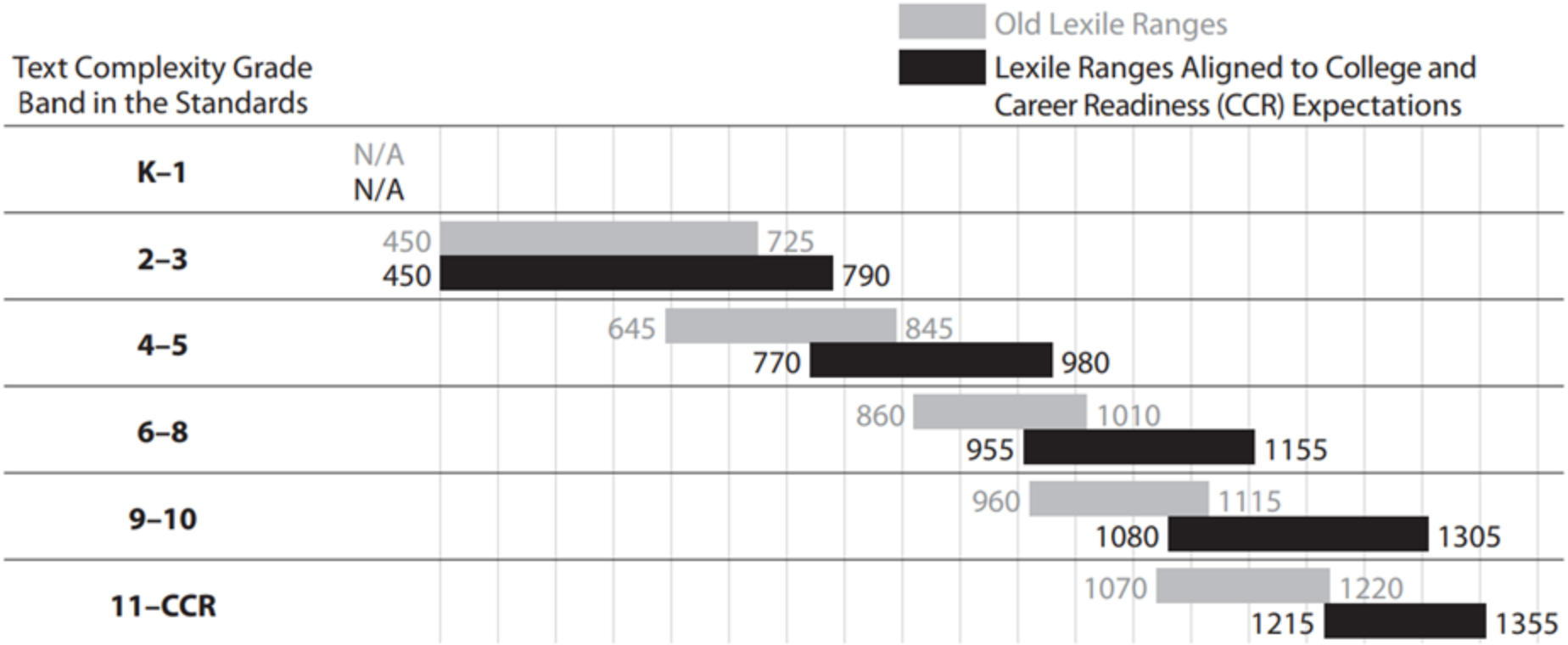
While not every aspect of text complexity (e.g., cultural knowledge) can be assessed, the quantifiable indices based on data-driven linguistic measures have ***proven useful*** for helping teachers determine the complexity levels of texts

Jin, T., & Lu, X. (2018). A data-driven approach to text adaptation in teaching material preparation: Design, implementation and teacher professional development. *TESOL Quarterly*, *52*(2), 457-467.

Lexile

One typical example is ***Lexile***, in which a text complexity ***staircase*** is introduced that recommends accelerated levels from Grade 2 to Grade 12

Hiebert, E. H., & Mesmer, H. A. E. (2013). Upping the ante of text complexity in the Common Core State Standards: Examining its potential impact on young readers. *Educational Researcher*, *42*(1), 44-51.



a text complexity **staircase** is introduced
that recommends **accelerated levels** from Grade 2 to Grade 12
http://journals.sagepub.com/doi/pdf/10.3102/0013189X12459802

Concept 1
Complexity Indices

a range of ***quantifiable indices*** based on linguistic measures, in which a ***text complexity staircase*** is introduced to help teachers determine the complexity levels of texts

Our Solution

1 Benchmark Corpus

We constructed a large-scale ***benchmark corpus*** comprised of text samples representing the proficiency levels at six educational stages including ***primary graduate***, ***junior secondary***, ***senior secondary***, ***collegiate basic***, ***collegiate intermediate***, ***collegiate advanced***

Text samples include a *unique collection* ***from*** *teaching materials* ***and*** *exam papers*

educational stages	***teaching materials***	***exam papers***
primary graduate	the texts used in ***teaching materials*** for different grade levels in the English language curricular approved by the Chinese Ministry of Education	the texts employed in ***exam papers*** including *Senior High School Entrance Examination*, *College Entrance Examination*, *College English Test*, *Postgraduate Entrance Examination* etc.
junior secondary		
senior secondary		
collegiate basic		
collegiate intermediate		
collegiate advanced		

Our Solution

2 Linguistic Measures

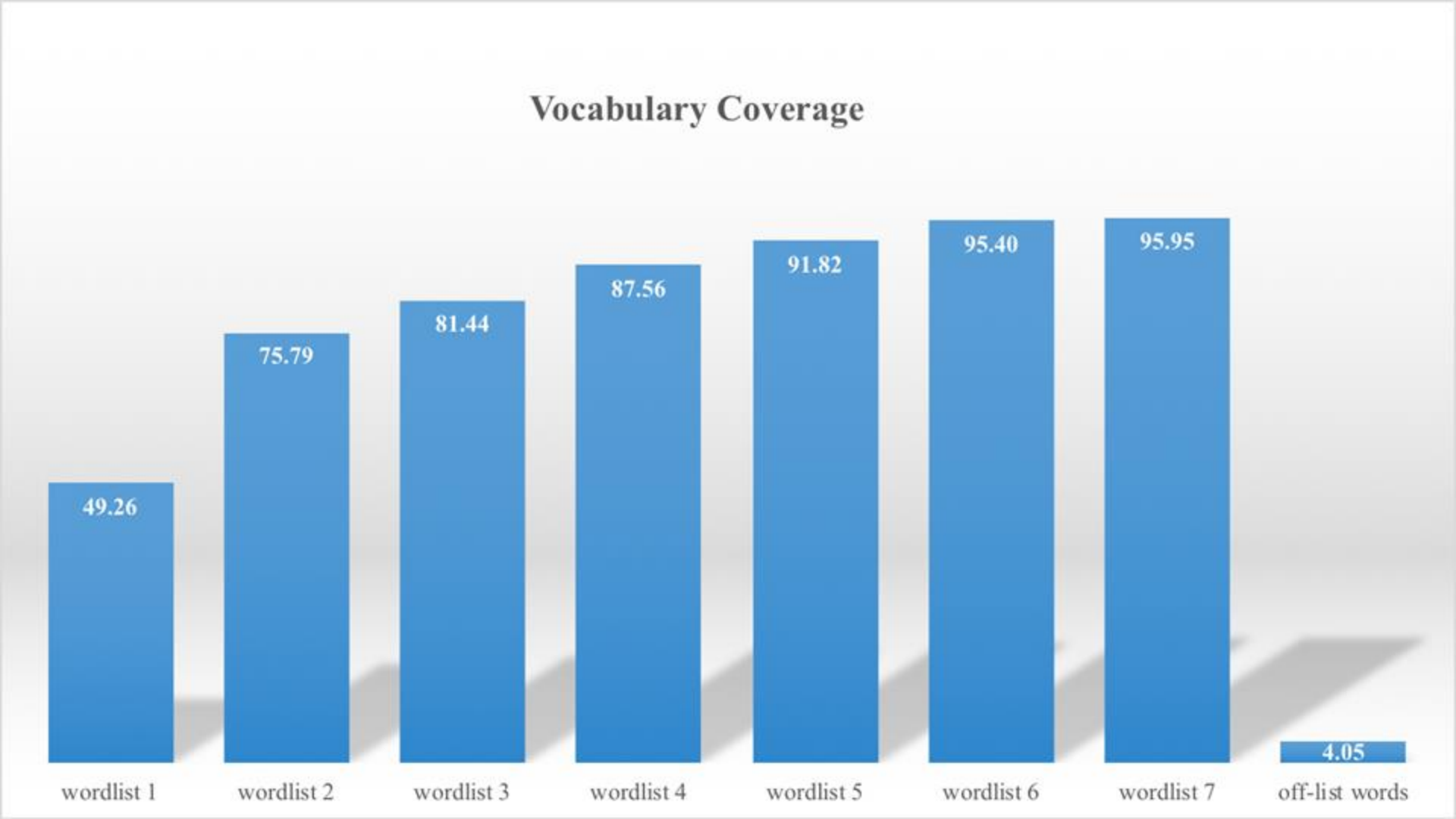
We employed **15** linguistic measures which can represent the construct of text complexity and be meaningful to Chinese EFL teachers, including ***lexical profiles*** **(8)**, ***syntactic profiles*** **(6)**, and ***text length*** **(1)**.

lexical profiles

- running words of a text are compared against ***vocabulary lists*** provided in China's national English curriculum standards for different proficiency levels
- percentages of a text's running words ***covered by vocabulary lists*** produce the lexical profiles of a text (see Jin, Li & Li, 2016)

vocabulary lists in curriculum standards

- **wordlist 1** *primary graduate*
- **wordlist 2** *junior secondary*
- **wordlist 3** *senior secondary* (a)
- **wordlist 4** *senior secondary* (b)
- **wordlist 5** collegiate basic
- **wordlist 6** collegiate intermediate
- **wordlist 7** collegiate advanced


Vocabulary Coverage
49.26
75.79
81.44
87.56
91.82
95.40
95.95
4.05
wordlist 1
wordlist 2
wordlist 3
wordlist 4
wordlist 5
wordlist 6
wordlist 7
off-list words

tesol QUARTERLY

tesol international association

BRIEF REPORTS AND SUMMARIES

Vocabulary Coverage of Reading Tests: Gaps Between Teaching and Testing

Tan Jin, Yunting Li, Baichuan Li

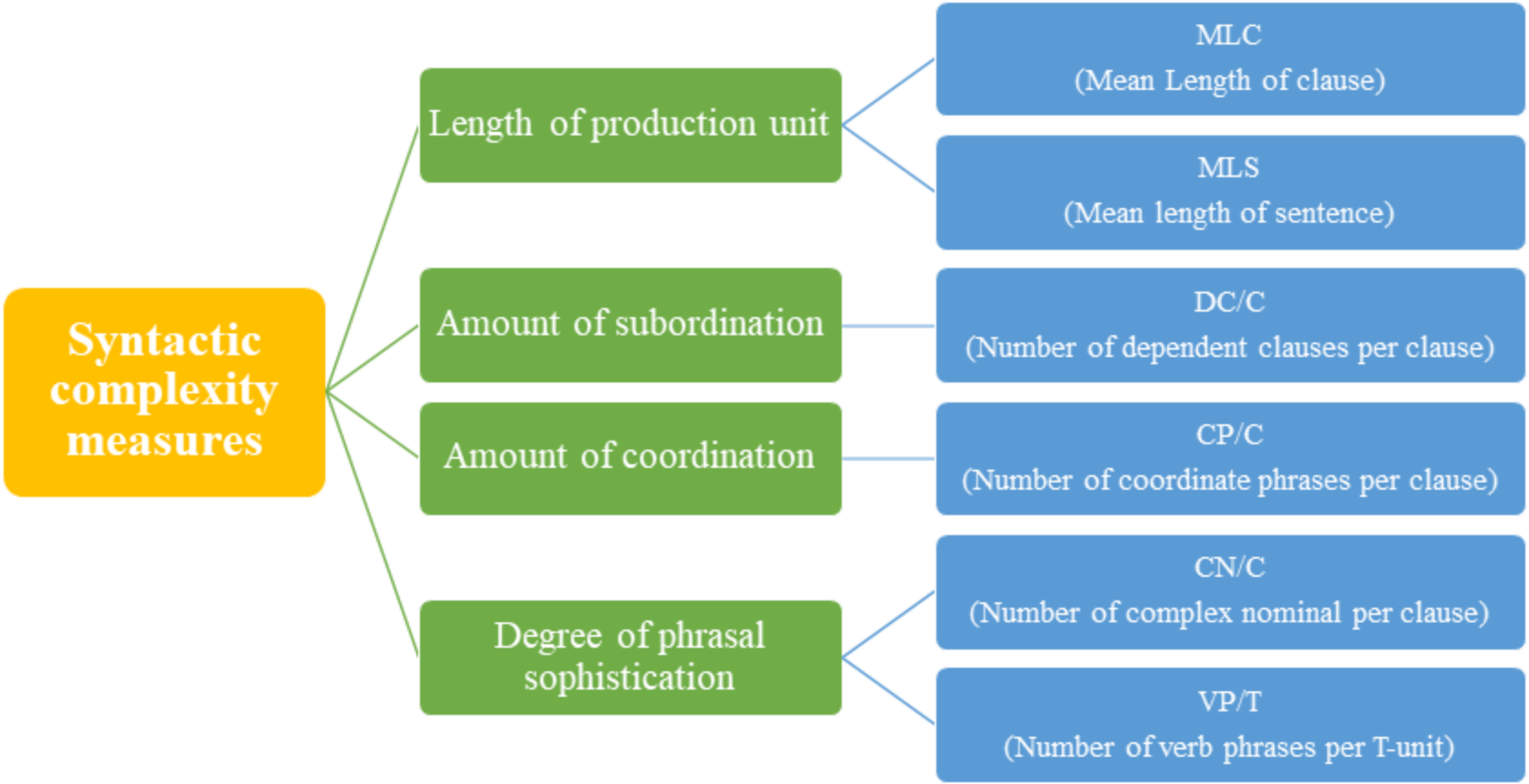
First published: 09 December 2016 | https://doi.org/10.1002/tesq.324 | Cited by: 2

Jin, T., Li, Y., & Li, B. (2016). Vocabulary coverage of reading tests: Gaps between teaching and testing. *TESOL Quarterly, 50(4)*, 955-964.

syntactic profiles

- ***L2 Syntactic Complexity Analyzer*** (L2SCA; Lu, 2017) is used to analyze the syntactic structures of the sentences in a text
- **6 specific measures** perceived to be ***useful*** and ***meaningful*** by Chinese EFL teachers have been selected to generate the syntactic profiles

Lu, X. (2017). Automated measurement of syntactic complexity in corpus-based L2 writing research and implications for writing assessment. *Language Testing*, *34*(4), 493-511.



Lu, X. (2017). Automated measurement of syntactic complexity in corpus-based L2 writing research and implications for writing assessment. *Language Testing*, *34*(4), 493-511.

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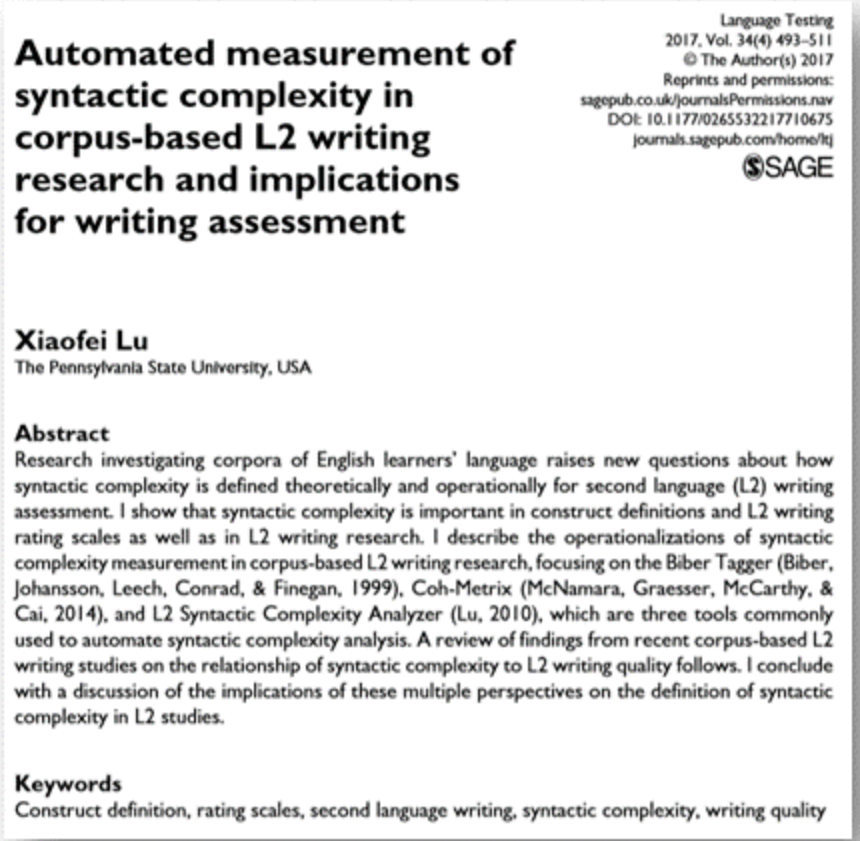

Language Testing
2017, Vol. 34(4) 493–511

DOI: 10.1177/0265532217710675
journals.sagepub.com/home/ltj
SAGE

Automated measurement of syntactic complexity in corpus-based L2 writing research and implications for writing assessment

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Abstract
Research investigating corpora of English learners' language raises new questions about how syntactic complexity is defined theoretically and operationally for second language (L2) writing assessment. I show that syntactic complexity is important in construct definitions and L2 writing rating scales as well as in L2 writing research. I describe the operationalizations of syntactic complexity measurement in corpus-based L2 writing research, focusing on the Biber Tagger (Biber, Johansson, Leech, Conrad, & Finegan, 1999), Coh-Metrix (McNamara, Graesser, McCarthy, & Cai, 2014), and L2 Syntactic Complexity Analyzer (Lu, 2010), which are three tools commonly used to automate syntactic complexity analysis. A review of findings from recent corpus-based L2 writing studies on the relationship of syntactic complexity to L2 writing quality follows. I conclude with a discussion of the implications of these multiple perspectives on the definition of syntactic complexity in L2 studies.

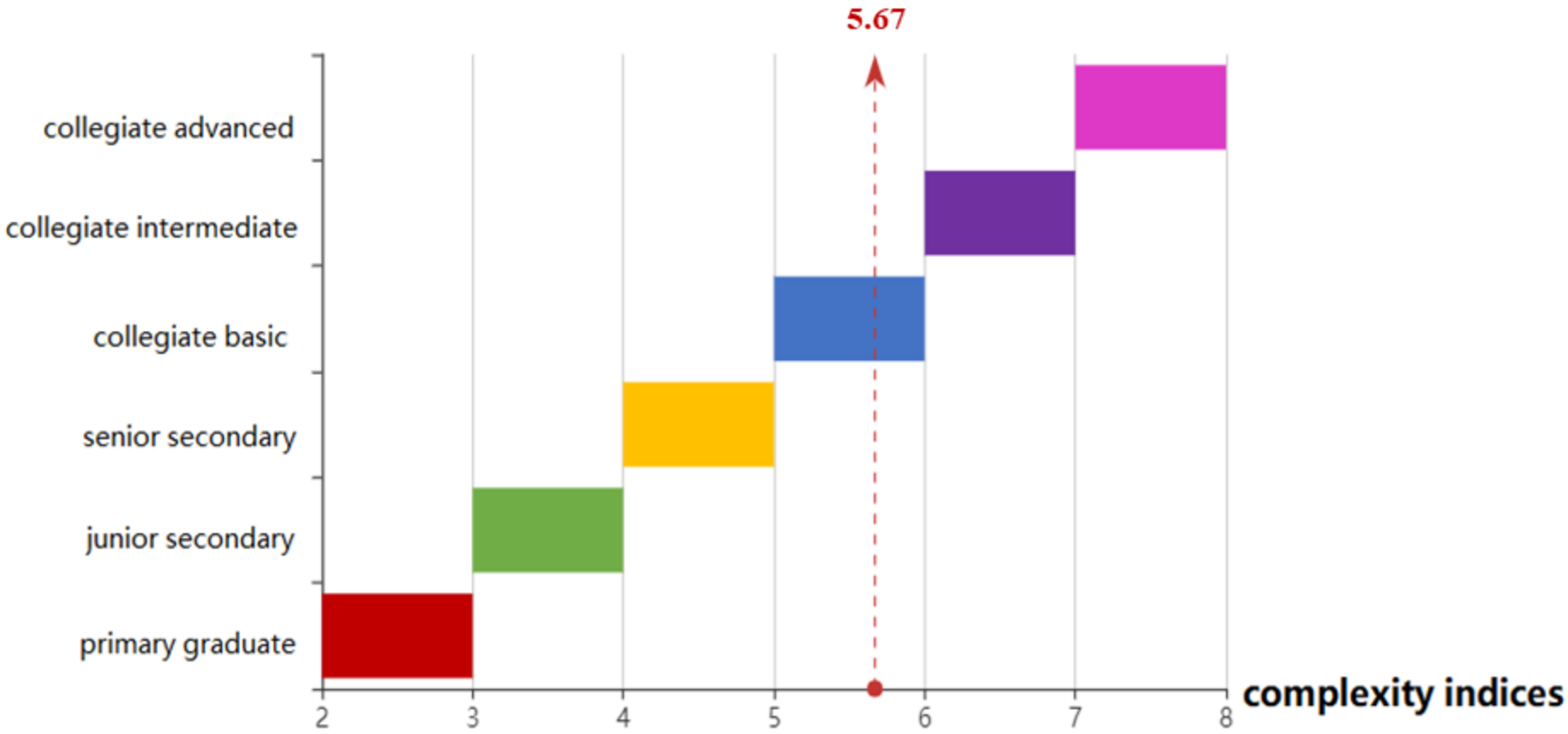
Keywords
Construct definition, rating scales, second language writing, syntactic complexity, writing quality

Our Solution

3 Complexity Indices

A machine learning algorithm, '***random forest***', was employed, with the **15 linguistic measures** adopted, to examine the text samples in the **benchmark corpus**, producing the **complexity indices** in the Chinese context

Based on the *complexity indices*, a **text complexity staircase** is introduced to help teachers determine the complexity levels of texts **in the Chinese context**



the red arrow in the middle points to the complexity level of a text

Project 1

Matching Text

Case A

Autonomous Vehicles

REPORTS | SOCIOLOGY

The social dilemma of autonomous vehicles

Jean-François Bonnefon[1], Azim Shariff[2,*], Iyad Rahwan[3,†]
+ See all authors and affiliations

Science 24 Jun 2016:
Vol. 352, Issue 6293, pp. 1573-1576
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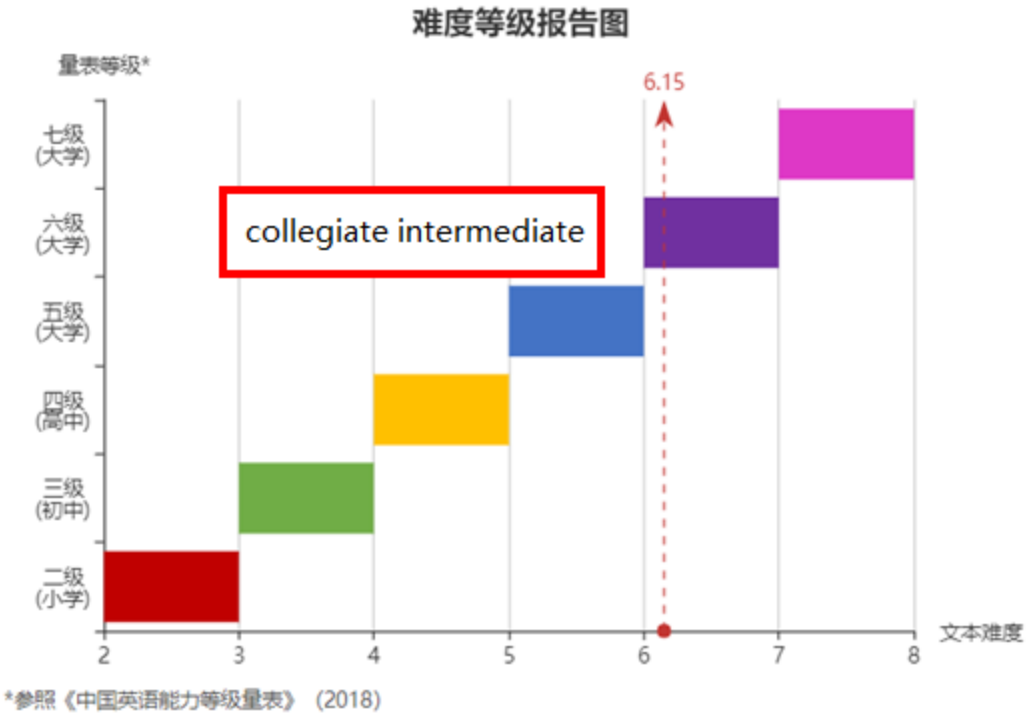
Codes of conduct in autonomous vehicles

When it becomes possible to program decision-making based on moral principles into machines, will self-interest or the public good predominate? In a series of surveys, Bonnefon *et al.* found that even though participants approve of autonomous vehicles that might sacrifice passengers to save others, respondents would prefer not to ride in such vehicles (see the Perspective by Greene). Respondents would also not approve regulations mandating self-sacrifice, and such regulations would make them less willing to buy an autonomous vehicle.

Science, this issue p. **1573**; see also p. **1514**

英语阅读分级指难针



*参照《中国英语能力等级量表》（2018）

Concept 1 Summary

- based on the ***15 linguistic measures*** from *lexical profiles*, *syntactic profiles* and *text length*
- the ***complexity index*** of the text, **Case A** *autonomous vehicles*

is **most likely**, ***in the Chinese context***, **comparable to**

- the text samples from the ***collegiate intermediate level*** in the **benchmark corpus**

Concept 2
Lexical Profiles

complexity index

of the text, **Case A**

autonomous vehicles

is at the **collegiate**

intermediate level

Science

The social dilemma of autonomous vehicles

Jean-François Bonnefon[1], Azim Shariff[2,*], Iyad Rahwan[3,†]

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Abstract

Autonomous vehicles (AVs) should reduce traffic accidents, but they will sometimes have to choose between two evils, such as running over pedestrians or sacrificing themselves and their passenger to save the pedestrians. Defining the algorithms that will help AVs make these moral decisions is a formidable challenge. We found that participants in six Amazon Mechanical Turk studies approved of utilitarian AVs (that is, AVs that sacrifice their passengers for the greater good) and would like others to buy them, but they would themselves prefer to ride in AVs that protect their passengers at all costs. The study participants disapprove of enforcing utilitarian regulations for AVs and would be less willing to buy such an AV. Accordingly, regulating for utilitarian algorithms may paradoxically increase casualties by postponing the adoption of a safer technology.

Case A

ETHICS

Which kind of

linguistic adaptation

is needed

if **Case A** is to be

used for **collegiate**

basic level

Science

The social dilemma of autonomous vehicles

Jean-François Bonnefon[1], Azim Shariff[2,*], Iyad Rahwan[3,†]

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Case A

ETHICS

We conducted a **survey**
among teachers and students,
and the most important **concern** is …

creating a wordlist containing the words that most students at the ***collegiate basic level*** (*most are freshmen or sophomores*) **may not be familiar with**

Project 2

Creating Wordlist

- One paragraph is selected from **Case A**.
- Can you **underline the words** that you think are challenging to most students at the ***collegiate basic level*** (freshmen or sophomores)?
- Please sort the words you identified by frequency of use, with **higher frequency first**.

Figuring out how to build ethical autonomous machines is one of the thorniest challenges in artificial intelligence today (***22***). As we are about to endow millions of vehicles with autonomy, a serious consideration of algorithmic morality has never been more urgent. Our data-driven approach highlights how the field of experimental ethics can provide key insights into the moral, cultural, and legal standards that people expect from autonomous driving algorithms. For the time being, there seems to be no easy way to design algorithms that would reconcile moral values and personal self-interest—let alone account for different cultures with various moral attitudes regarding life-life trade-offs (***23***)—but public opinion and social pressure may very well shift as this conversation progresses.

Bonnefon, J. F., Shariff, A., & Rahwan, I. (2016).
The social dilemma of autonomous vehicles. *Science*, *352*(6293), 1573-1576.

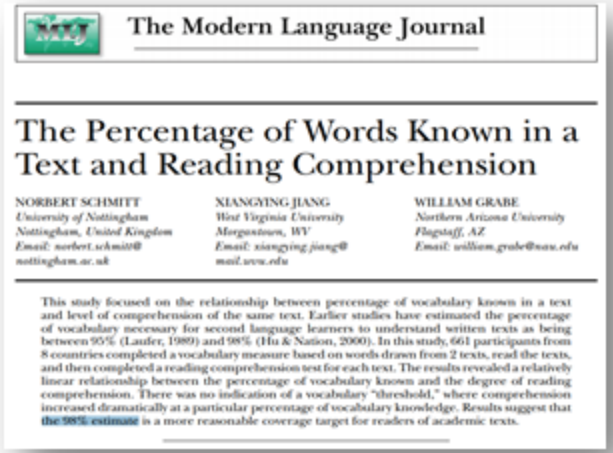
Creating Wordlist

rank	word	rank	word	rank	Word
1		5		9	
2		6		10	
3		7			
4		8			

Project 2

Creating Wordlist

The Percentage Issue



The Modern Language Journal

The Percentage of Words Known in a Text and Reading Comprehension

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This study focused on the relationship between percentage of vocabulary known in a text and level of comprehension of the same text. Earlier studies have estimated the percentage of vocabulary necessary for second language learners to understand written texts as being between 95% (Laufer, 1989) and 98% (Hu & Nation, 2000). In this study, 661 participants from 8 countries completed a vocabulary measure based on words drawn from 2 texts, read the texts, and then completed a reading comprehension test for each text. The results revealed a relatively linear relationship between the percentage of vocabulary known and the degree of reading comprehension. There was no indication of a vocabulary "threshold," where comprehension increased dramatically at a particular percentage of vocabulary knowledge. Results suggest that the 98% estimate is a more reasonable coverage target for readers of academic texts.

no need to know all words;

< 2% unknown words

is a **reasonable** target for reading materials

Schmitt, N., Jiang, X., & Grabe, W. (2011). The percentage of words known in a text and reading comprehension. *The Modern Language Journal*, *95*(1), 26-43.

Concept 2
Lexical Profiles

- running words of a text are compared against ***vocabulary lists*** provided in China's national English curriculum standards for different proficiency levels
- percentages of a text's running words ***covered by vocabulary lists*** produce the lexical profiles of a text (see Jin, Li & Li, 2016)

Our Solution

1 Predicting Words

Using the ***lexical profiles***, we can easily **predict the unknown words** for students at different proficiency levels in the Chinese context.

Figuring out how to build ethical autonomous machines is one of the thorniest challenges in artificial intelligence today (***22***). As we are about to endow millions of vehicles with autonomy, a serious consideration of algorithmic morality has never been more urgent. Our data-driven approach highlights how the field of experimental ethics can provide key insights into the moral, cultural, and legal standards that people expect from autonomous driving algorithms. For the time being, there seems to be no easy way to design algorithms that would reconcile moral values and personal self-interest—let alone account for different cultures with various moral attitudes regarding life-life trade-offs (***23***)—but public opinion and social pressure may very well shift as this conversation progresses.

Bonnefon, J. F., Shariff, A., & Rahwan, I. (2016).
The social dilemma of autonomous vehicles. *Science*, *352*(6293), 1573-1576.

Predicting unknown words in red for senior secondary

Figuring out how to build ethical[3+18] autonomous machines is one of the thorniest[0+4] challenges in artificial intelligence[14+53] today (22). As we are about to endow[0+2] millions of vehicles with autonomy[1+6], a serious consideration of algorithmic morality has never been more urgent. Our data-driven approach highlights how the field of experimental ethics[1+5] can provide key insights into the moral, cultural, and legal standards that people expect from autonomous driving algorithms[0+1]. For the time being, there seems to be no easy way to design algorithms[0+1] that would reconcile[0+2] moral values and personal self-interest—let alone account for different cultures with various moral attitudes regarding life-life trade-offs (23)—but public opinion and social pressure may very well shift as this conversation progresses.

Predicting unknown words in red for collegiate basic

Figuring out how to build ethical[3+18] autonomous machines is one of the thorniest[0+4] challenges in artificial intelligence today (22). As we are about to endow[0+2] millions of vehicles with autonomy[1+6], a serious consideration of algorithmic morality has never been more urgent. Our data-driven approach highlights how the field of experimental ethics[1+5] can provide key insights into the moral, cultural, and legal standards that people expect from autonomous driving algorithms[0+1]. For the time being, there seems to be no easy way to design algorithms[0+1] that would reconcile moral values and personal self-interest—let alone account for different cultures with various moral attitudes regarding life-life trade-offs (23)—but public opinion and social pressure may very well shift as this conversation progresses.

Predicting unknown words in red for collegiate intermediate

Figuring out how to build ethical[3+18] autonomous machines is one of the thorniest challenges in artificial intelligence today (22). As we are about to endow millions of vehicles with autonomy, a serious consideration of algorithmic morality has never been more urgent. Our data-driven approach highlights how the field of experimental ethics[1+5] can provide key insights into the moral, cultural, and legal standards that people expect from autonomous driving algorithms[0+1]. For the time being, there seems to be no easy way to design algorithms[0+1] that would reconcile moral values and personal self-interest—let alone account for different cultures with various moral attitudes regarding life-life trade-offs (23)—but public opinion and social pressure may very well shift as this conversation progresses.

Our Solution

2 Prioritizing Words

We provide the ***benchmark frequency*** of each unknown word in the benchmark corpus ***at the upper right corner*** – this information is highly useful in helping to ***prioritize and rank*** the unknown words in creating a wordlist

Predicting unknown words in red for collegiate basic

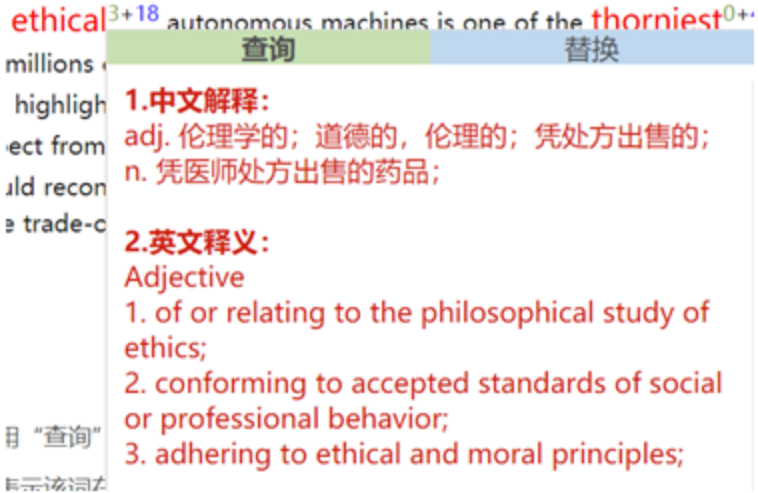
Figuring out how to build ethical[3+18] autonomous machines is one of the thorniest[0+4] challenges in artificial intelligence today (22). As we are about to endow[0+2] millions of vehicles with autonomy[1+6], a serious consideration of algorithmic morality has never been more urgent. Our data-driven approach highlights how the field of experimental ethics[1+5] can provide key insights into the moral, cultural, and legal standards that people expect from autonomous driving algorithms[0+1]. For the time being, there seems to be no easy way to design algorithms[0+1] that would reconcile moral values and personal self-interest—let alone account for different cultures with various moral attitudes regarding life-life trade-offs (23)—but public opinion and social pressure may very well shift as this conversation progresses.

Please note the upper right corner of the unknown words in red

Our Solution

3 Creating A Wordlist

- based on the ranking, we can easily verify that the **total percentage** of the unknown words included in the wordlist is **smaller than 2%**
- unknown words are provided with **annotations** including Chinese and English explanations, example sentences, synonyms and antonyms, etc.



Please note that unknown words are provided with **annotations** including ***Chinese and English explanations, example sentences, synonyms and antonyms***, etc.

Project 2

Creating Wordlist

- One paragraph is selected from **Case A**.
- Can you **underline the words** that you think are challenging to most students at the ***collegiate basic level*** (freshmen or sophomores)?
- Please sort the words you identified by frequency of use, with **high frequency first**.

Figuring out how to build ethical autonomous machines is one of the thorniest challenges in artificial intelligence today (***22***). As we are about to endow millions of vehicles with autonomy, a serious consideration of algorithmic morality has never been more urgent. Our data-driven approach highlights how the field of experimental ethics can provide key insights into the moral, cultural, and legal standards that people expect from autonomous driving algorithms. For the time being, there seems to be no easy way to design algorithms that would reconcile moral values and personal self-interest—let alone account for different cultures with various moral attitudes regarding life-life trade-offs (***23***)—but public opinion and social pressure may very well shift as this conversation progresses.

Bonnefon, J. F., Shariff, A., & Rahwan, I. (2016).
The social dilemma of autonomous vehicles. *Science*, *352*(6293), 1573-1576.

The wordlist automatically created from the paragraph selected from **Case A**

rank	word	benchmark frequency	text frequency	coverage	cumulative coverage	wordlist
1	ethical	21	1	0.86	0.86	off-list
2	autonomy	7	1	0.86	1.72	collegiate intermediate
3	ethics	6	1	0.86	2.59	off-list
4	thorn	4	1	0.86	3.45	collegiate intermediate
5	endow	2	1	0.86	4.31	collegiate intermediate
6	algorithm	1	2	1.72	6.03	off-list

Concept 2 Summary

- Using *lexical profiles*, the unknown words are **predicted** for students at different proficiency levels in the Chinese context
- each unknown word is **prioritized and ranked** based on the benchmark frequency
- the total percentage of the unknown words included in the wordlist is suggested to be **smaller than 2%**

Concept 3
Syntactic Profiles

complexity index

of the text, **Case A**

autonomous vehicles

is at the **collegiate**

intermediate level

Science

The social dilemma of autonomous vehicles

Jean-François Bonnefon[1], Azim Shariff[2,*], Iyad Rahwan[3,†]

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Science 24 Jun 2016:
Vol. 352, Issue 6293, pp. 1573-1576
DOI: 10.1126/science.aaf2654

Codes of conduct in autonomous vehicles

When it becomes possible to program decision-making based on moral principles into machines, will self-interest or the public good predominate? In a series of surveys, Bonnefon *et al.* found that even though participants approve of autonomous vehicles that might sacrifice passengers to save others, respondents would prefer not to ride in such vehicles (see the Perspective by Greene). Respondents would also not approve regulations mandating self-sacrifice, and such regulations would make them less willing to buy an autonomous vehicle.

Abstract

Autonomous vehicles (AVs) should reduce traffic accidents, but they will sometimes have to choose between two evils, such as running over pedestrians or sacrificing themselves and their passenger to save the pedestrians. Defining the algorithms that will help AVs make these moral decisions is a formidable challenge. We found that participants in six Amazon Mechanical Turk studies approved of utilitarian AVs (that is, AVs that sacrifice their passengers for the greater good) and would like others to buy them, but they would themselves prefer to ride in AVs that protect their passengers at all costs. The study participants disapprove of enforcing utilitarian regulations for AVs and would be less willing to buy such an AV. Accordingly, regulating for utilitarian algorithms may paradoxically increase casualties by postponing the adoption of a safer technology.

Case 3

ETHICS

Case 3

ETHICS

Which kinds of ***linguistic adaptation*** ***are needed*** if **Case A** is to be used for **collegiate** **basic level?**

Science

The social dilemma of autonomous vehicles

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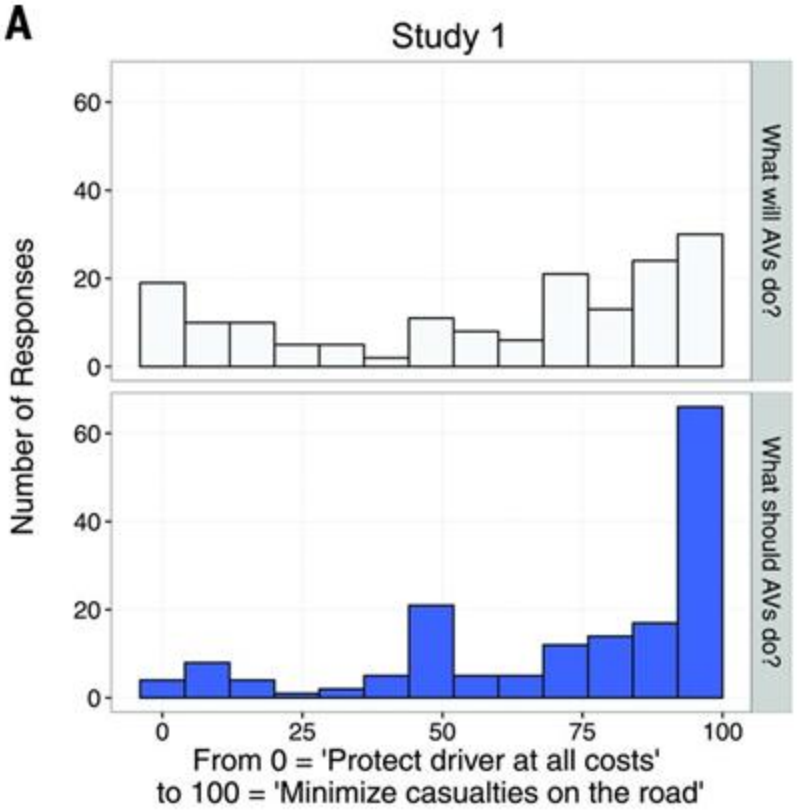
We conducted a **survey** among teachers and students, and the second **concern** is …

college students are not familiar with
the ***syntactic structures*** employed
in **interpreting data** from **Tables** and **Figures**

Project 3

Analyzing Structure

- One paragraph interpreting Fig. 2A is selected from **Case A**.
- Can you ***identify the syntactic structures*** that you think are challenging to college students (freshmen or sophomores)?
- Please share with us the structures you've identified, as well as **your reasons** for doing so..



Bonnefon, J. F., Shariff, A., & Rahwan, I. (2016).
The social dilemma of autonomous vehicles. *Science*, *352*(6293), 1573-1576.

In study one (n = 182 participants), 76% of participants thought that it would be more moral for AVs to sacrifice one passenger rather than kill 10 pedestrians [with a 95% confidence interval (CI) of 69 to 82]. These same participants were later asked to rate which was the most moral way to program AVs, on a scale from 0 (protect the passenger at all costs) to 100 (minimize the number of casualties). They overwhelmingly expressed a moral preference for utilitarian AVs programmed to minimize the number of casualties (median = 85) (**Fig. 2A**). However, participants were less certain that AVs would be programmed in a utilitarian manner (67% thought so, with a median rating of 70). Thus, participants were not worried about AVs being too utilitarian, as often portrayed in science-fiction works. If anything, they imagined future AVs as being less utilitarian than they should be.

Bonnefon, J. F., Shariff, A., & Rahwan, I. (2016).
The social dilemma of autonomous vehicles. *Science*, *352*(6293), 1573-1576.

Project 3

Analyzing Structure

One undergraduate student analyzed the ***syntactic structures*** as below:

1. In study ... (n = ... participants), ... of participants ***thought that*** it would be more ... for ... to ... rather than ... [***with*** a 95 confidence interval (CI) of ... to ...].
2. These ... participants were later asked to rate ***which was*** the most ... way to ..., on a scale from ... to ....
3. They overwhelmingly ***expressed a ... preference for*** ... (Fig. ...).
4. However, participants ***were less certain that*** ... would be ... in a ... manner (... thought so, with a median rating of ...).
5. Thus, participants were not worried about ... ***being*** ..., ***as often portrayed in*** ...

Concept 3
Syntactic Profiles

- syntactic structures of a text are analyzed using ***L2 Syntactic Complexity Analyzer*** (L2SCA; Lu, 2017)
- To help Chinese EFL teachers analyze syntactic structures, **5 kinds of annotations** are provided: *the longest sentence, dependent clauses, coordinate phrases, complex nominals, non-finite verb phrases*

Lu, X. (2017). Automated measurement of syntactic complexity in corpus-based L2 writing research and implications for writing assessment. *Language Testing*, *34*(4), 493-511.

Work in Progress

1 The Longest Sentence

In study one (n = 182 participants), 76of participants thought that it would be more moral for AVs to sacrifice one passenger rather than kill 10 pedestrians [with a 95confidence interval (CI) of 69 to 82]. These same participants were later asked to rate which was the most moral way to program AVs, on a scale from 0 (protect the passenger at all costs) to 100 (minimize the number of casualties). They overwhelmingly expressed a moral preference for utilitarian AVs programmed to minimize the number of casualties (median = 85) (Fig. 2A). However,

*Longer sentences generally contain **more information*** and are ***harder to process***.
*The longest sentence in the text is **underlined** so that the teacher may shorten it if necessary.*

2 Dependent Clauses

In study one (n = 182 participants), 76of participants thought that it would be more moral for AVs to sacrifice one passenger rather than kill 10 pedestrians [with a 95confidence interval (CI) of 69 to 82]. These same participants were later asked to rate which was the most moral way to program AVs, on a scale from 0 (protect the passenger at all costs) to 100 (minimize the number of casualties). They overwhelmingly expressed a moral preference for utilitarian AVs programmed to minimize the number of casualties (median = 85) (Fig. 2A). However, participants were less certain that AVs would be programmed in a utilitarian manner (67thought so, with a median rating of 70). Thus, participants were not worried about AVs being too utilitarian, as often portrayed in science-fiction works. If anything, they imagined future AVs as being less utilitarian than they should be.

Subordination constitutes ***a second dimension*** *of syntactic complexity.*
Here, ***the first finite verb of each finite dependent clause*** *is highlighted. If necessary, a teacher may* ***reduce one or more*** *finite dependent clauses to an independent clause for easier processing.*

3 Coordinate Phrases

In study one (n = 182 participants), 76of participants thought that it would be more moral for AVs to sacrifice one passenger rather than kill 10 pedestrians [with a 95confidence interval (CI) of 69 to 82]. These same participants were later asked to rate which was the most moral way to program AVs, on a scale from 0 (protect the passenger at all costs) to 100 (minimize the number of casualties). They overwhelmingly expressed a moral preference for utilitarian AVs programmed to minimize the number of casualties (median = 85) (Fig. 2A). However, participants were less certain that AVs would be programmed in a utilitarian manner (67thought so, with a median rating of 70). Thus, participants were not worried about AVs being too utilitarian, as often portrayed in science-fiction works. If anything, they imagined future AVs as being less utilitarian than they should be.

*Phrasal coordination constitutes **a third dimension** of syntactic complexity.*
***No coordinate phrase** is found in this text, but had there been one or more coordinate noun, verb, or adjectival phrases, they **would have been highlighted**.*

4 Complex Nominals

In study one (n = 182 participants), 76of participants thought that it would be more moral for AVs to sacrifice one passenger rather than kill 10 pedestrians [with a 95confidence interval (CI) of 69 to 82]. These same participants were later asked to rate which was the most moral way to program AVs, on a scale from 0 (protect the passenger at all costs) to 100 (minimize the number of casualties). They overwhelmingly expressed a moral preference for utilitarian AVs programmed to minimize the number of casualties (median = 85) (Fig. 2A). However, participants were less certain that AVs would be programmed in a utilitarian manner (67thought so, with a median rating of 70). Thus, participants were not worried about AVs being too utilitarian, as often portrayed in science-fiction works. If anything, they imagined future AVs as being less utilitarian than they should be.

*Complex nominals, i.e., noun phrases with one more modifiers, such as an adjective, a post-modifying prepositional phrase, or a relative clause, are **characteristic** of academic writing.*
*At the same time, they may also be **difficult to process**.*
*Here, **the head nouns** of the complex nominals in the texts are highlighted.*

In study one (n = 182 participants), 76of participants thought that it would be more moral for AVs to sacrifice one passenger rather than kill 10 pedestrians [with a 95confidence interval (CI) of 69 to 82]. These same participants were later asked to rate which was the most moral way to program AVs, on a scale from 0 (protect the passenger at all costs) to 100 (minimize the number of casualties). They overwhelmingly expressed a moral preference for utilitarian AVs programmed to minimize the number of casualties (median = 85) (Fig. 2A). However, participants were less certain that AVs would be programmed in a utilitarian manner (67thought so, with a median rating of 70). Thus, participants were not worried about AVs being too utilitarian, as often portrayed in science-fiction works. If anything, they imagined future AVs as being less utilitarian than they should be.

*Notice that there may be **occasional errors** in the analysis, and automatic identification of **the boundaries** of complex nominals is more error-prone. There, the highlighting serves as **an aid to the teacher in identifying** complex nominals and their boundaries.*

5 Non-finite Verb Phrases

In study one (n = 182 participants), 76of participants thought that it would be more moral for AVs to sacrifice one passenger rather than kill 10 pedestrians [with a 95confidence interval (CI) of 69 to 82]. These same participants were later asked to rate which was the most moral way to program AVs, on a scale from 0 (protect the passenger at all costs) to 100 (minimize the number of casualties). They overwhelmingly expressed a moral preference for utilitarian AVs programmed to minimize the number of casualties (median = 85) (Fig. 2A). However, participants were less certain that AVs would be programmed in a utilitarian manner (67thought so, with a median rating of 70). Thus, participants were not worried about AVs being too utilitarian, as often portrayed in science-fiction works. If anything, they imagined future AVs as being less utilitarian than they should be.

Finally, we also highlight ***non-finite verb phrases****,*
including ***infinitives****,* ***present participle****, and* ***past participle****.*

Concept 3 Recommendation

- In future work, ***syntactic profiles*** can be further investigated in order to help teachers analyze the syntactic structures of an academic reading text **more accurately and effectively**
- In addition to wordlists, **a phrasal expressions list** can be created to facilitate the automated analysis of academic reading texts for students at different proficiency levels

using our online **free** tool
for ***text adaptation***

Open your browser

Enter

LanguageData.net

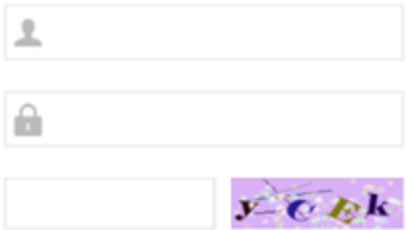
you will get the website shown on the right

click on the logo directly in ***the middle below***

You will get access to ***our tool for text adaptation***

英语阅读分级指难针

主持人： 金 檀、陆小飞、郭 凯、李百川



请注册/登录后使用指难针 (使用手册)

研制基础： 词汇缺口 (2016) | 句法档案 (2017) | 难度调控 (2018)

Jin, T., Lu, X., Guo K., & Li, B. (2018). *Eng-Editor: A data-driven tool for English text adaptation.* Guangzhou: LanguageData (languagedata.net/tester).

If you use it for the first time, please click the ***register*** button

Now you can fill in your ***relevant information***

Enter ***verification code*** and click ***register*** to log in

Next, you will get this webpage. Paste the text you want to analyze into the ***middle box***

Enter ***verification code*** and click ***start analysis***

The tool will jump to the ***user center***

Wait a few seconds until the ***wait*** in the operation status bar to change to ***view***

Click ***view*** to see the results

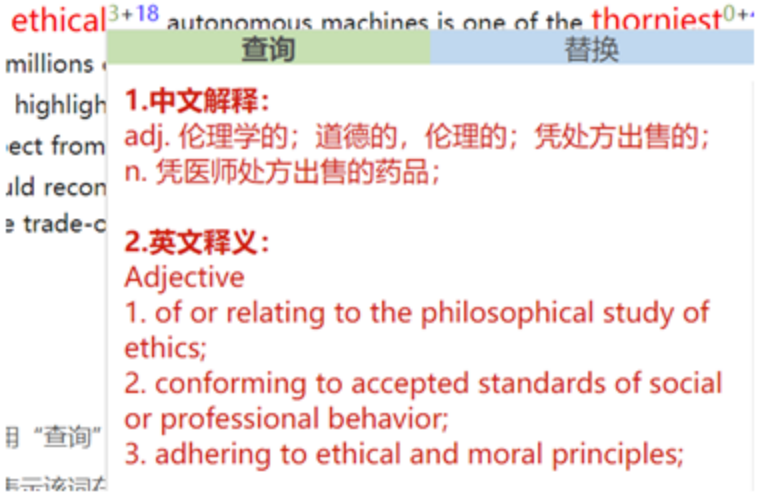
Now you will get the webpage of ***lexical profiles***

You can
select a wordlist
of one proficiency level
in the Chinese context
for predicting
unknown words in red

Predicting unknown words in red for collegiate basic

Figuring out how to build ethical[3+18] autonomous machines is one of the thorniest[0+4] challenges in artificial intelligence today (22). As we are about to endow[0+2] millions of vehicles with autonomy[1+6], a serious consideration of algorithmic morality has never been more urgent. Our data-driven approach highlights how the field of experimental ethics[1+5] can provide key insights into the moral, cultural, and legal standards that people expect from autonomous driving algorithms[0+1]. For the time being, there seems to be no easy way to design algorithms[0+1] that would reconcile moral values and personal self-interest—let alone account for different cultures with various moral attitudes regarding life-life trade-offs (23)—but public opinion and social pressure may very well shift as this conversation progresses.

Please note the upper right corner of the unknown words in red



left click on the word in red will get the **annotations** automatically including ***Chinese and English explanations, example sentences, synonyms and antonyms***, etc.

Click to get the new ***wordlist*** you created

Click ***next*** to enter the webpage for ***syntactic profiles***

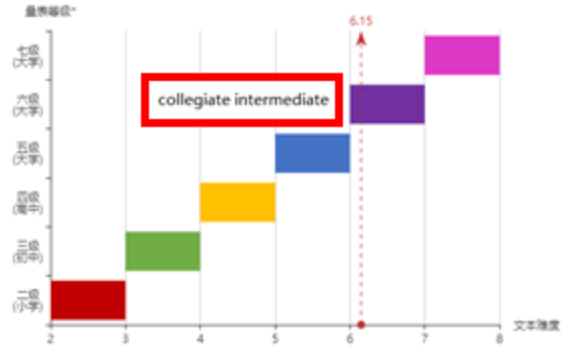
Now you arrive at the webpage of ***syntactic profiles***

Click ***next*** for the webpage of ***complexity indices***

Finally, you will arrive at the webpage of ***complexity indices***

英语阅读分级指难针

难度等级报告图



*参照《中国英语能力等级量表》(2018)

难度指标报告表

类别	量化指标	对应等级
词汇难度	7.48	七级 (大学)
句法难度	4.30	四级 (高中)
文本难度	6.15	六级 (大学)

引用请注明出处：

金煦、陈小飞、郭凯、李西川 (2018). "英语阅读分级指难针". 广州：语言数据网 (languagedata.net/tester).

Jin, T., Lu, X., Guo, K., & Li, B. (2018). *Eng-Editor: An online English text evaluation and adaptation system.* Guangzhou: LanguageData (languagedata.net/tester).

Case A

Autonomous Vehicles

REPORTS | SOCIOLOGY

The social dilemma of autonomous vehicles

Jean-François Bonnefon[1], Azim Shariff[2,*], Iyad Rahwan[3,†]
+ See all authors and affiliations

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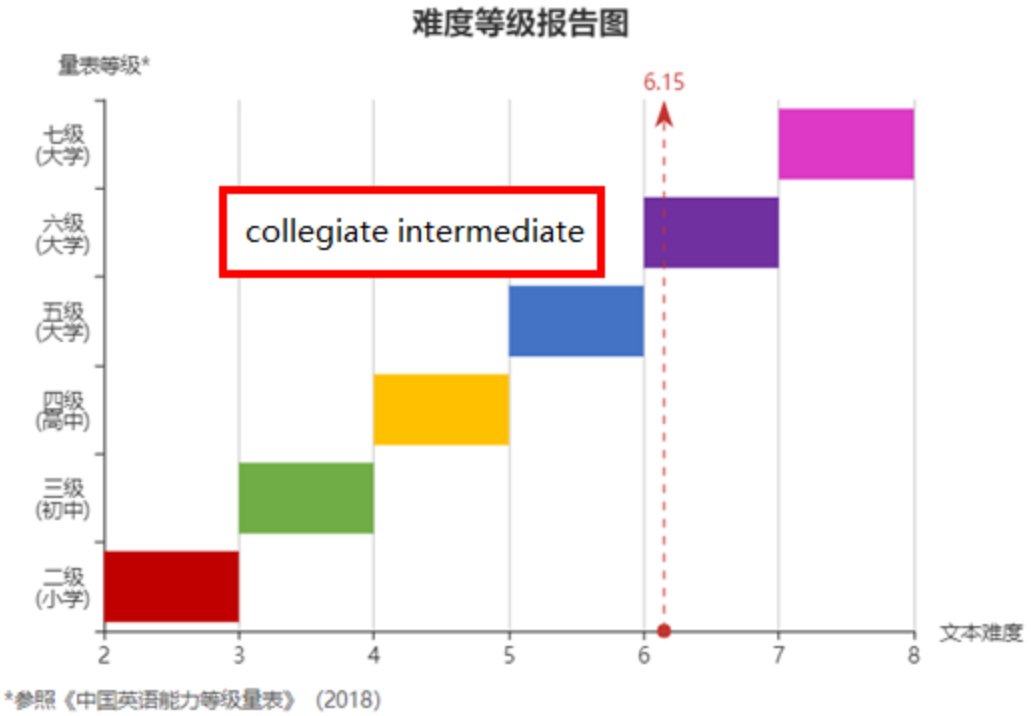
Science, this issue p. **1573**; see also p. **1514**

英语阅读分级指难针



*参照《中国英语能力等级量表》（2018）

for ***more details***,
please visit our
Online Guidelines

Outline

Part I text complexity

Concept 1 *Complexity Indices*

Part II linguistic adaptation

Concept 2 *Lexical Profiles*

Concept 3 *Syntactic Profiles*

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