

# Exploring comparison constructions in Ndebele and Mandarin: The storyboard *The Twin Dilemma*\*

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**Abstract:** This paper introduces the storyboard “The Twin Dilemma,” which was created to investigate how languages encode comparisons, and in particular, comparative constructions. The storyboard aims to elicit different kinds of comparison constructions to inform linguistic analysis. We present two narrations of the storyboard, first from Ndebele (Niger-Congo, Bantu; Zimbabwe), and then from Mandarin Chinese, along with some initial hypotheses as to the syntactic and semantic analysis of the comparative in these languages.

**Keywords:** comparison, comparatives, degree semantics, Ndebele, Mandarin Chinese

## 1 Introduction

Languages vary as to the constructions they use to encode comparisons and employ a number of different strategies to talk about the extent to which entities possess a certain property like age or height. In English, these constructions are built around gradable adjectives like *old* or *tall* and include the following:

- (1) The comparative construction
  - a. Predicative comparative
    - i. Cecilia is taller than Verna.
    - ii. Verna is shorter than Cecilia.
  - b. Adverbial comparative
    - i. Cecilia runs faster than Verna.
    - ii. Verna runs slower than Cecilia.
  - c. Attributive comparative
    - i. Cecilia is a better musician than Verna.
    - ii. Verna is a worse musician than Cecilia.

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- d. Contextual comparative
  - i. Cecilia is taller!
  - ii. Verna is shorter!
- e. Differential comparative
  - i. Marilyn is seven years older than Verna.
  - ii. Verna is seven years younger than Marilyn.
- (2) Comparison with a degree
  - a. Cecilia is taller than 180cm.
  - b. Cecilia is shorter than 190cm.
- (3) Positive constructions
  - a. Cecilia is tall.
  - b. Verna is young.
- (4) Superlative constructions
  - a. Cecilia is the tallest.
  - b. Verna is the youngest.
- (5) Equative constructions
  - a. Unmodified equative
    - i. Verna is as old as Cecilia.
  - b. Factorial phrase equative
    - i. Marilyn is twice as old as Verna.
- (6) Degree questions
  - a. How old is Verna?
- (7) Measure constructions
  - a. Verna is ten years old.
  - b. Cecilia is that old, too.
- (8) Differential degree questions
  - a. How much taller is Cecilia than Verna?

Among these constructions, the comparative in (1) has featured most prominently in the research literature. The comparative in English encodes an ordering relation (that is, greater or less than) between two individuals or an individual and a degree with respect to some property. For instance, in (1a-i), Cecilia  $>_{\text{HEIGHT}}$  Verna. Whether this ordering relation is made obvious from the construction with dedicated morphosyntax (i.e., explicitly encoded) or is ambiguous and has to be inferred (i.e., implicitly encoded) is however a major point of cross-linguistic variation (Kennedy 2007; Beck et al. 2009; Bochnak 2015, Davis and Mellesmoen 2019; Hohaus and Bochnak 2020).

We introduce in this paper a storyboard that has been designed not only to survey the inventory of comparison constructions in a language and their morphosyntax, but also to provide an initial set of data that inform the semantic analysis, particularly with respect to whether a language adopts an explicit or an implicit strategy for comparison. Ultimately, the analysis of the language's strategy for comparison will require further follow-up elicitation, but the storyboard provides valuable initial data.

This storyboard was produced as part of a language documentation project,<sup>1</sup> and it was used with two languages, Ndebele (Niger-Congo, Bantu; Zimbabwe) and Mandarin Chinese (Sino-Tibetan; China). Based on the data elicited with our storyboard, we propose that both languages adopt the explicit strategy for the comparative, each having a dedicated morphosyntactic form for comparison. It should be mentioned here that our contribution is predominantly methodological, and we do not offer conclusive empirical or analytical contributions to the study of Ndebele or Mandarin.

Our paper is structured as follows: Firstly, we will provide some more background on comparison constructions and on both languages in §2, followed by a brief review of our methodology in §3. An overview of the storyboard we created to elicit comparison constructions is given in §4, before we present the Ndebele and Mandarin narrations with a discussion of the data in §5 and §6, respectively. We briefly overview both sets of data in §7, before concluding in §8.

## 2 Linguistic background

### 2.1 Background on the comparative construction

In this section, we will provide some background on the typology of the comparative construction, illustrated in (1) above. Stassen (1985) identifies a number of distinct morphosyntactic strategies that languages can use to form the comparative. The most important types in this typology include the particle comparative, the EXCEED-type comparative and the conjoined comparative.

The particle comparative uses a morphological particle within a single clause to create a comparison, as shown in (9). Crucially, for us, the morpheme *-er* specifies an ordering relation. We will refer to *Lucy* as the comparee NP and to *Luke* as the standard. While the comparee NP and the comparative predicate (in this case 'high') are typically obligatory, the standard does not need to be present if it is retrievable from the discourse context, as in (1d) above.

(10) Lucy jumped higher than Luke.

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<sup>1</sup> Research for this project was approved under the School of Arts, Languages, and Cultures Research Ethics Policy at the University of Manchester for low-risk projects. The language consultants, RG (Ndebele) and QZ (Mandarin), gave informed consent to participate in this research.

The second type, the EXCEED-type, encodes a greater-than ordering relation in a verb that would translate as ‘to exceed,’ or ‘to pass,’ where the comparison standard is the complement, as in the Ndebele example in (10).<sup>234</sup>

- (11) U Cecilia m’dala u-kwedlul-a u Verna  
 1 Cecilia 1SM.old 1SM-exceed-FV 1 Verna  
 ‘Cecilia is older than Verna.’  
 (Lit.) ‘Cecilia is old, exceeding Verna.’ (elicited data, acceptability judgement task)

The final type mentioned here is the conjoined comparative, which contrasts two distinct clauses, one containing the comparee NP and the other the standard NP. This can be seen in (12), an example from Motu (Austronesian, Oceanic; Papua New Guinea).

- (12) Mary-na lata to Frank-na kwadoḡi  
 Mary-TOP tall but Frank-TOP short  
 ‘Mary is tall but Frank is short.’  
 (Beck et al. 2009:47)

The cross-linguistic semantics of these different comparatives has been the focus of a significant body of research in the past 20 years (see Hohaus and Bochnak 2020 for a recent overview). Most importantly for the purposes of this paper, languages seem to vary as to whether their comparative makes reference to degrees and explicitly encodes the ordering relation between the comparee and the standard; or whether the semantics of the construction is vague, and the ordering relation remains implicit. This difference can be seen below, where we sketch analyses of the comparative construction in (13) under both the explicit (14) and implicit (15) strategies.

- (13) Lucy is taller than Luke.

- (14) The interpretation of the comparative under the explicit strategy:  
 HEIGHT(Lucy) > HEIGHT(Luke)  
 ‘Lucy’s height degree exceeds Luke’s height degree.’

- (15) The interpretation of the comparative under the implicit strategy:  
 TALL(Lucy) & ¬TALL(Luke)  
 ‘Lucy is considered tall in the context and Luke is not.’  
 (↔ Lucy is taller than Luke.)

<sup>2</sup> Ndebele data were glossed by one of the authors, Siena Weingartz. Any mistakes are her own.

<sup>3</sup> Abbreviations used in glosses: 1–15 (in Ndebele narration): noun classes; 1, 2, 3 (in Mandarin narration): 1st/2nd/3rd person; ADJ: adjective; AUG: augment; AUX: auxiliary; CAUS: causative; CAN: possibility marker; CONT: continuous; COMP: complementizer; COP: copula; DEM: demonstrative; DIST: distal; FV: final vowel; IMM: immediate; INF: infinitive; INT: intensifier; LOC: locative; NEG: negative; OM: object marker; PL: plural; POSS: possessive; PRES: present tense marker; PROG: progressive; PRON: pronoun; PST: past; Q: question particle; REL: relative clause marker; SG: singular; SM: subject marker; SUBJ: subjunctive; TOP: topic

<sup>4</sup> Unless otherwise stated, all data are original and elicited by way of translation or production task.

While (15) is a viable analysis for the interpretation of the conjoined comparative in Motu (Beck et al. 2009), it is not the primary analysis for English (von Stechow 1984). For Motu, (14) is not a feasible analysis given its syntactic structure and the absence of dedicated morphology for degree (Beck et al. 2009).

It is important to take into account that there is not necessarily a one-to-one mapping between the form and meaning, that is, between the type of comparative used and the semantic strategy a language employs (explicit or implicit); analysing this mapping in a specific language has proven far from trivial. Despite this, there are multiple indicators of which strategy a language adopts, some of which are more overt than others. One of the most salient is the syntax of the comparison constructions. If the syntax is that of a conjoined comparative, and the interpretation relies on the unmarked form of a property concept (for example, tall), then the language adopts the implicit strategy. In the presence of a dedicated morphosyntactic form, like *more* in English, it is a matter of analysis as to whether the form is indicative of the explicit or implicit strategy: that is, does *more* encode '>' or '&-?' schematically speaking? (see in particular Deal and Hohaus 2019).

As shown in the introduction, English comparatives allow for the difference between the comparee and the standard to be specified by a measure phrase (see (1e), for example). It is however unclear how such a measure phrase would be interpreted under the implicit strategy, which relies on assigning the comparee a certain property, but not the standard. Therefore, whether a language allows for differential comparatives (that is, using a measure phrase to specify the difference between individuals) has been taken to be a major diagnostic in determining whether the language requires a degree-based analysis, and in turn, adopts an explicit or implicit strategy. *The Twin Dilemma* storyboard was designed to allow an initial classification of the language under investigation both in the morphosyntactic as well as the semantic typology of comparatives.

## 2.2 Background on Ndebele

Ndebele is a Nguni language spoken mainly in Zimbabwe, Southern Africa by around 1,610,000 speakers (Eberhard, Simons and Fennig 2020). While Ndebele is not classified as endangered (Moseley 2010), it is under-researched and under-represented in the available literature. The Ethnologue classifies Zimbabwean Ndebele as having a large speaker population, and is used for wider communication, for example in mass media (Eberhard, Simons and Fennig 2020). Note that it is also an official language of Zimbabwe.

The basic word order in Ndebele is subject-verb-object (SVO). The verb consists of a root and a final vowel (FV), and gains affixes to show tense, modality, aspect, etc. Subject and object markers are prefixed to the verb, creating a verb-internal SOV order as in (16). As shown in (15), *-thand-* 'to love', is the verbal root with the typical *-a* as the FV. The present progressive prefix *-ya-* marks the tense and aspect, preceded by the subject marker *zi-* and followed by the object marker *-m-*.

- (16) Izi-nja zi-ya-m-thand-a um-fana.  
9-dog 9SM-PROG-1OM-love-FV 1-boy  
'The dogs love the boy.' (based on Sibanda 2004: 24, our translation)

In §5, we will describe and analyse Ndebele comparatives in more depth—something not yet well-documented.

### 2.3 Background on Mandarin Chinese

Mandarin Chinese belongs to the Sino-Tibetan language family and is part of a group of Sinitic (Chinese) languages which are spoken mostly across Northern and South-Western China. With around 920 million native speakers, Mandarin Chinese is regarded as a national language and well-documented (Eberhard, Simons and Fennig 2020).

As in Ndebele, the basic word order of Mandarin Chinese is subject-verb-object (SVO), as in (17) (Light 1979). Although the word order of Mandarin Chinese is rather flexible, it is undoubtedly considered to be a VO language (Sun and Wang 2015).

- (17) Ta      mai shu      le.  
3.SG.M sell book(s) PFV  
'He sold book(s).'
- (based on Light 1979:150)

Mandarin Chinese is typologically categorized as an isolating language which has almost no inflection (Yu and Zhang 2019). Generally, the case-marking pattern of Mandarin Chinese is a neutral pattern (Comrie 2013), under which the subject and object are morphologically unmarked, as can be seen in (18) and (19).

- (18) Ren      lai      le.  
person come PFV  
'The person came.'

- (19) Zhangsan kua      Lisi le      ma?  
Zhangsan praise Lisi PFV Q  
'Did Zhangsan praise Lisi?'
- (based on Li and Thompson 1981:20)

Unlike in Ndebele, comparison constructions (and in particular the comparative) in Mandarin Chinese have featured in the linguistic research literature (see, for instance, Krasikova 2008; Liu 2010; Erlewine 2018). However, we believe that the data elicited with the help of our storyboard will be valuable not only because the resulting data set offers a survey of the inventory of comparison constructions in the language, but also because the storyboard allows for the elicitation of parallel data sets from different languages. In §6, we will examine the ways that Mandarin Chinese can form its comparatives, and the morphology it employs to encode the superlative.

### 3 Methodology

In this section, we first briefly review the use of storyboards for targeted production in the fieldwork setting. We will then explain the rationale behind *The Twin Dilemma* storyboard and document some of the stages of its creation.

As explained by Burton and Matthewson (2015), storyboards consist of a script in the contact language and a set of matching picture panels. In linguistic fieldwork, storyboards are used to collect production data following the informal protocol in (20).

- (20) a. Based on the script, the researcher tells the story in the contact language showing the language consultant the matching pictures.
- b. With the help of the picture panels, the language consultant retells the story in their own words.
- c. The consultant approves a transcribed version of their story (provided they are literate in their language).

Through the use of a storyboard, there is little interference from the contact language (Matthewson 2011). Retelling a story means the elicitation is provided in a natural and more spontaneous manner than asking for translations of a list of sentences, for example. Furthermore, for follow-up elicitation after the narration, further data—crucially, negative data—can be gathered. Turning now to the motivation behind *The Twin Dilemma* storyboard; the grammar of comparison is not well-researched in many languages, and varies (see §2.1 above). *The Twin Dilemma* is, to our knowledge, the first storyboard that systematically explores many different kinds of comparison constructions. Other storyboards,<sup>5</sup> such as *What Matters* (Bogal-Allbritten, Coppock, and Nouri-Hosseini 2018) and *The Beekeeper* (Dorreen et al. 2017) provide some prompts that involve comparisons, but the primary aim of the former is superlatives, whereas the aim of the latter is colour adjectives; they do not elicit a large inventory of comparatives (and crucially not the data required for a typological classification of comparative constructions in a language). In contrast, Table 1 shows the constructions that are targeted by *The Twin Dilemma* storyboard. Note that the individual panels target a certain construction, but do not necessarily guarantee the elicitation of the particular construction; hence follow-up elicitation and subsequent analysis are vital. We highlight the inclusion of the differential comparative and of a differential degree question, which provide crucial evidence for the analysis of the comparative as using either the explicit or the implicit strategy.

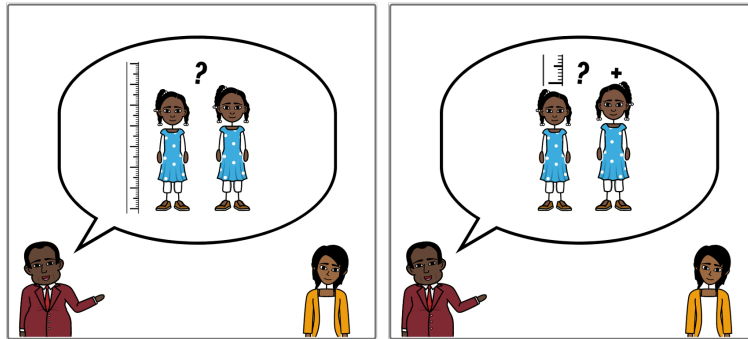
**Table 1:** Constructions targeted in the *The Twin Dilemma* storyboard

<b>Comparison construction</b>	<b>Corresponding panels in <i>The Twin Dilemma</i></b>
Predicative comparative	E
Adverbial comparative	K
Attributive comparative	I
Contextual comparative	D
The positive	A, N
The superlative (predicative, adverbial)	H, L
The equative	J
Differential degree question	F

Working to create an enjoyable storyboard that clearly demonstrated the comparatives we aimed to elicit presented us with some challenges. This meant that we had to rework certain panels in order to ensure that our storyboard was as effective as possible. For example, the differential degree question was difficult to visualise in a manner that would ensure this particular construction was produced. The development of this panel is shown in Figure 1. The image on the left is the original panel for the differential degree question. The ruler and question mark were not enough for a speaker

<sup>5</sup> *Totem Field Storyboards* (URL: <<http://totemfieldstoryboards.org/>> last accessed 22 June 2020).

to remember the original prompt and produce the right type of question. During piloting, other questions this panel elicited included *Who is taller, Cecilia or Verna?* (a plain *wh*-question with a contextual comparative), *Is Verna taller than Cecilia?* (a yes-no question with a predicative phrasal comparative) and *How tall are the twins?* (a degree question). By adding the plus symbol and shorter ruler, we managed to elicit the target question.



**Figure 1:** Original and revised storyboard Panel <E> “How much taller is Cecilia than Verna?”

To create the storyboard panels, we used *StoryboardThat*,<sup>6</sup> an online platform which supplied us with the necessary characters, symbols, backgrounds, and diversity that we wanted to include. We designed three versions of *The Twin Dilemma*, changing the twins’ names and their ethnic groups in the hope that a language consultant would feel more comfortable with a storyboard that reflects their culture and/or heritage. We use the African version in the next section to introduce the storyboard in more detail.

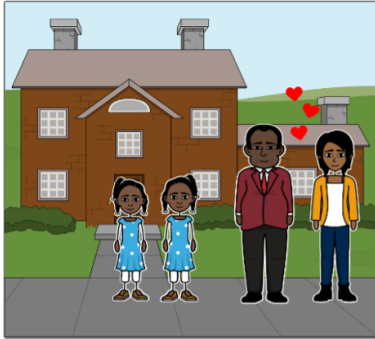
#### 4 The Storyboard *The Twin Dilemma*

Below, we introduce one version of the storyboard, throughout which we highlight the comparison constructions that could be elicited from the use of this storyboard. Note that there are no panels that explicitly elicit the positive construction with a gradable predicate in a predicative position (*Dad is tall*, for example), but only in an attributive position (Panels A and O). The fieldworkers are expected to have already obtained some knowledge of gradable predicates in predicative positions.

<sup>6</sup> StoryboardThat (URL: <<https://www.storyboardthat.com/>>)



<A>



Cecilia and Verna are twins. They live with their parents in a big house.

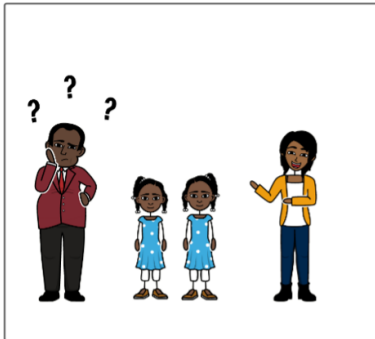
*By beginning with the adjective 'big' we can find the base form of an adjective, and whether it can syntactically appear as a modifier inside a noun phrase.*

<B>



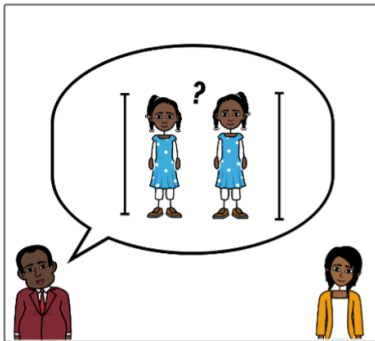
One day, Mom was talking about the twins...

<C>



But Dad couldn't remember which twin was Cecilia and which twin was Verna!

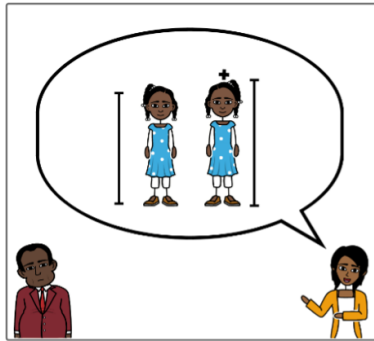
<D>



"Who is taller?" asked Dad,

*This question is an example of a contextual comparative, where the comparison standard is implicit, understood as '... than the other one,' and retrievable from the utterance context.*

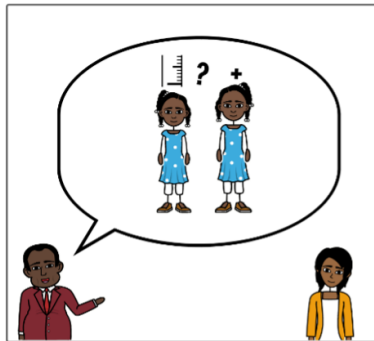
<E>



“Cecilia is taller than Verna,” Mom replied.

*This panel elicits a predicative comparative with a phrasal standard, allowing the language to demonstrate one of the most basic forms of comparison.*

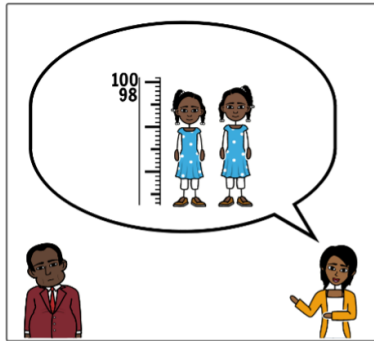
<F>



“But how much taller is Cecilia than Verna?” Dad asked.

*This is a differential degree question and provides evidence for whether the language in question employs the explicit or implicit strategy to encode comparison.*

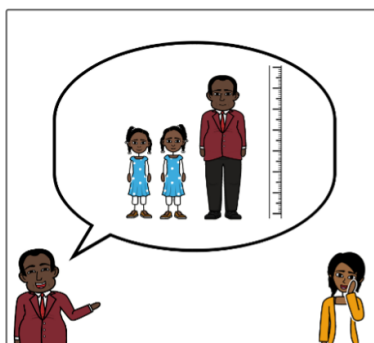
<G>



“Cecilia is two cm taller than Verna,” Mom said.

*The answer provides a differential comparative, where the measure phrase is used to specify the height difference between the twins. Again, the produced construction informs a semantic analysis of the underlying strategy used in the comparative, with differential comparatives being compatible only with the explicit strategy. Consultants are expected to produce paraphrases or no differential comparative at all if the comparison in the target language uses the implicit strategy.*

<H>



“But I’m the tallest!” Dad laughed,

*The superlative is offered by this panel. This panel could potentially also elicit a predicative comparative where the standard is ‘than everyone’ or ‘than the twins.’*

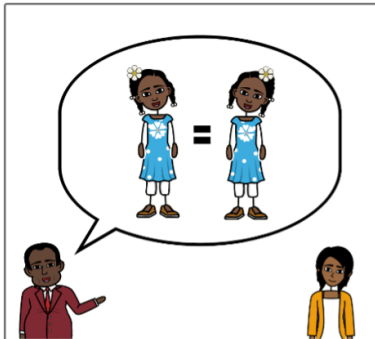
<I>



“Hm, well Cecilia is a better musician than Verna,” Mom said.

*This panel aims to elicit an attributive comparative. By using ‘musician,’ it is hoped an adverbial (‘better singer/sings better,’ for example) can be avoided.*

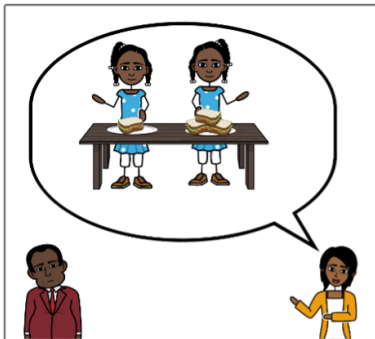
<J>



“But Verna is as pretty as Cecilia,” Dad reminded her.

*The equative arises here, and it is worth noting whether a native speaker uses the form as mentioned here, or suggests a reciprocal in the standard, that is, “they are as pretty as each other.”*

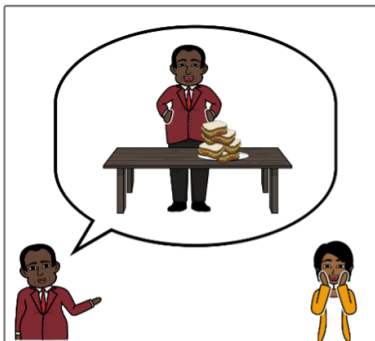
<K>



“Yes. Hm, Cecilia eats more than Verna,” Mom said.

*We intended this panel to elicit an adverbial comparative, but the English prompt also potentially allows for an attributive analysis, as in “Cecilia eats more food than Verna.”*

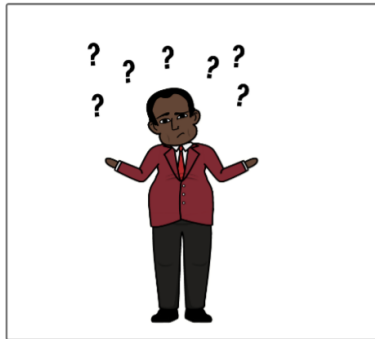
<L>



“But I eat the most!” Dad laughed.

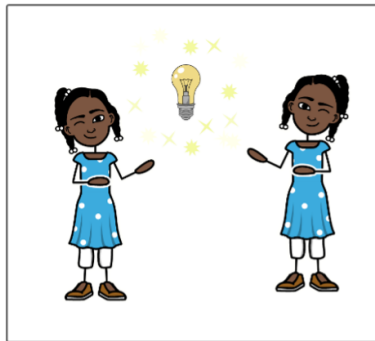
*Again, the superlative, but not in a predicative position as in <H>.*

<M>



Dad still didn't know which twin was Cecilia and which twin was Verna.

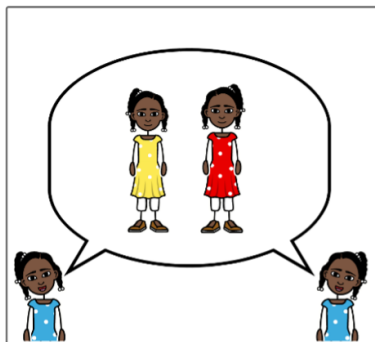
<N>



Cecilia and Verna had a great idea!

*This panel could elicit the positive form of a gradable predicate, similarly to <A>.*

<O>



"We could wear different-coloured dresses," the twins suggested.

<P>



Now Dad knows which twin is Cecilia and which twin is Verna!

## 5 Ndebele

### 5.1 The Story in Ndebele: *Inkinga Yama Mawele* 'Twin Puzzle'

Below, we present the results from *The Twin Dilemma* narrated and written in Ndebele by RG (age 59), a native speaker from Zimbabwe, Southern Africa. RG lived in Zimbabwe from birth and

moved to England at the age of 37 years. She spoke the closely-related Ndebele and Zulu at home and learnt English in school from the age of six.

Note that the literal translations are given in order to convey which kind of construction is used in Ndebele. The bold print highlights the construction that was targeted by the prompt.

(21) RG's Ndebele Narration

- a. <A>: U Cecilia lo Verna ama-wele. Ba-hlal-a la-ba-zali babo  
 1 Cecilia and Verna 6-twin 2SM-live-FV with-2-parent 2.POSS.PRON  
**endlini en-kulu**  
**9.LOC.house 9.ADJ-large**  
 'Cecilia and Verna are twins. They live with their parents in a **big house**.'
- b. <B>: Aba-zali babo ba-be-khulum-a nga-bo  
 2-parent 2.POSS.PRON 2.SM-PST.CONT-speak-FV about-2.PRON  
 'Their parents were talking about them.'
- c. <C>: U-baba wa-ye-nga-sa-khumbul-i u-kuthi u Cecilia ngowuphi  
 1-father PST-CAN-NEG-still-remember-NEG AUG-15.COMP 1 Cecilia which.one.is  
 njalo u Verna ngowuphi njengo-ba be-fanan-a.  
 and also 1 Verna which.one.is like-2.PRON PST.CONT-be.same-FV  
 'Dad still couldn't remember which one is Cecilia and which one is Verna since they look alike.'
- d. <D>: U-baba wa-se-buz-a u-kuthi ngu-bani omude u-kwedlul-a  
 1-father PST-now-ask-FV AUG-15.COMP COP-who 1.ADJ.tall 1SM-exceed-FV  
**o-munye phakathi kwa-bo bobabili.**  
**1.REL-another between to-2.PRON 2.pron-two**  
 'Dad then asked **who is taller between the two of them**.'  
 (Lit.) 'Dad then asked **who is it who is tall exceeding the other between the two of them**.'
- e. <E>: U-mama wa-phendul-a wa-thi u Cecilia mude u-kwedlul-a u Verna.  
 1-mother PST-reply-FV PST-say 1 Cecilia 1SM.tall SM-exceed-FV 1 Verna  
 'Mama replied and said **Cecilia is tall, exceeding Verna**.'
- f. <F>: U-baba wa-phendul-a wa-thi mude oku-nganani ku-lo Verna.  
 1-father PST-reply-FV PST-say 1SM.tall 15-how.much LOC-1.DEM Verna  
 'Dad replied (and) said **how much taller is she than Verna**.'  
 (Lit.) 'Dad replied (and) said **she is tall how much [in terms of measurement] on Verna**.'
- g. <G>: U-mama wa-thi um-e-dlul-a ngama sentimitha ama-bili.  
 1-mother PST-say 1SM-?<sup>8</sup>-exceed-FV by centimetre 6.ADJ-two  
 'Mama said **she exceeds by two centimetres**.'

<sup>8</sup> This particle may be present for phonological reasons, but we do not have enough data to know if it has any grammatical effect.

- h. <H>: U-baba wa-hlekelel-a esithi yena ngu-ye omude ku-labo  
 1-father PST-chuckle-FV saying 1.PRON COP-1.PRON 1.ADJ.tall LOC-2.DEM  
**boba-bili.**  
**2.PRON-two**  
 ‘Dad chuckled, saying **it is he who is taller than both of them.**’
- i. <I>: U-mama wa-qhubek-a wa-thi u Cecilia u-ye-nelis-a uku-dlala  
 1-mother PST-continue-FV PST-say 1 Cecilia 1SM-PRES-be.able-FV 15-play  
**ama-chacho ngcono ku-lo Verna.**  
**6-instrument better LOC-1.DEM Verna**  
 ‘Mama continued (and) said **Cecilia is able to play instruments better than Verna.**’
- j. <J>: U-baba wa-khumbuz-a u-mama ukubana ama-nkazana woma-bili  
 1-father PST-remind-FV 1-mother 15.REL 6-girl 6.PRON-two  
**ma-hle kakhulu oku-fananayo.**  
**6.ADJ-beautiful very 15.ADJ-similar**  
 ‘Dad reminded Mama that **the two girls are both very beautiful in the same way.**’
- k. <K>: U-mama wa-se-phind-a wa-thi u Cecilia u-ya-dla u-kwedlul-a  
 1-mother PST-now-repeat-FV PST-say 1 Cecilia 1SB-PROG-eat 1SM-exceed-FV  
**u Verna.**  
**1 Verna**  
 ‘Mama then added **Cecilia eats more than Verna (exceeding her).**’
- l. <L>: U-baba wa-buy-a wa-hlekelel-a esithi yena ngu-ye o-dla  
 1-father PST-reply-FV PST-chuckle-FV saying 1.PRON COP-1.PRON 1.REL-eat  
**u-kwedlul-a bo-nke.**  
**1SM-exceed-FV 2-all**  
 ‘Dad replied (and) chuckled, saying **it is he who eats more than everyone (exceeding all).**’
- m. <M>: Konke lo-khu a-k-um-siz-anga u-baba ngoba wayeloke engazi  
 all DEM-15 NEG.PST-15SM-1OM-help-NEG 1-father because he.still.did.not.know  
 u-kuthi u Cecilia ngowuphi njalo u Verna ngowuphi phakathi  
 AUG-15.COMP 1 Cecilia which.one.is and also 1 Verna which.one.is between  
 kwa-wo ama-wele.  
 15.POSS-6.PRON 6-twin  
 ‘All of this did not help Dad because he still did not know which one is Cecilia and also which one is Verna between the twins.’
- n. <N>: Ama-wele ba-cabang-a in-dlela e-nga-siz-a u-baba wabo  
 6-twin 2SM.PST-think-FV 9-way 9.REL-CAN-help-FV 1-father 2.POSS.PRON  
 ukubana a-be-hlukan-is-e, azi u-kuthi u Verna ngowuphi  
 to 1SM-2-separate-CAUS-SUBJ know AUG-15.COMP 1 Verna which.one.is  
 njalo u Cecilia ngowuphi.  
 and also 1 Cecilia which.one.is  
 ‘The twins thought of a way that might help their dad to distinguish<sup>9</sup> which one is Verna and which one is Cecilia.’

- o. <O>: Ba-pha um-bono wo-kuthi kumbe ba-nga-gqoka izi-gqok e-zi-fananayo  
 2.PST-give 1-idea 6SM-15.COMP maybe 2SM-CAN-wear 8-dress REL-8.ADJ-similar  
 kodwa zi-tshiyen-e um-bala wazo.  
 but 8SM-be.different-SUBJ 1-colour 8.POSS.PRON  
 ‘They gave the idea that maybe they could wear dresses which are similar but are different  
 in their colour.’
- p. <P>: U-baba **wa-thokoz-a** **kakhulu** ngoba lokho k-wa-m-siz-a  
 1-father **1SM.PST-be.happy-FV** **very** because 15.DEM.DIST 15SM-PST-1OM-help-FV  
 kakhulu u-kuthi azi uku-be-hlukan-is-a.  
 much AUG-15.COMP know 15-2-separate-CAUS-FV  
 ‘Dad was **very happy** because that helped him a lot to distinguish them.’

## 5.2 Discussion of Ndebele

Using the data elicited from the storyboard plus data from additional elicitation, we describe here two different morphosyntactic strategies that Ndebele employs to form a comparative proper (the construction found in (1), at the beginning). We argue that the semantics of both of these strategies relies on the explicit strategy. We will end this section with a brief survey of the other comparison constructions (for example, superlatives) elicited by the storyboard.

Ndebele comparatives come in two different shapes morphosyntactically. First, in the typology of Stassen (1985), the language has an EXCEED-type comparative that schematically can be represented as in (22). Secondly, Ndebele uses a locative comparative whose schematic representation is in (23). The EXCEED-type comparative is a serial verb construction in which the comparee is the subject and the standard the object. Within the locative comparative, the standard is introduced by a locative preposition that translates to ‘on’ or ‘in.’ Note that (23) is built around the unmarked form of the gradable predicate and there is no piece of morphology that translates to ‘more.’<sup>10</sup>

(22) Ndebele EXCEED-type comparative:

[[subject comparee][[gradable predicate + EXCEED][object standard]]]

(23) Ndebele locative comparative:

[[subject comparee][gradable predicate[P<sub>LOC</sub> standard]]]

The motivation behind glossing *kwedlula* as ‘exceed’ comes from speaker intuitions and production tasks. When asked to use *kwedlula*, a speaker produced the following sentence with the corresponding translation:

<sup>9</sup> ‘Distinguish’ is formed by the two words, *abehlukanise*, a form of ‘separate,’ and *azi* ‘know.’

<sup>10</sup> We are aware of one case where a comparative has been lexicalised, namely *ngcono* ‘better’ as seen in Panel I. Note however that *ngcono* cannot be analysed as comparative morphology, that is, corresponding to English *-er* or *more*.

- (24) Ngi-za kwedlula Verna  
 1SG-FUT pass Verna  
 ‘I will pass Verna.’

After being asked in what sense one could use this phrase, she confirmed it was felicitous in contexts such as winning a race or achieving better academically. Similarly, the reason for glossing *kulo* as a locative also comes from a production task. A speaker produced the following when asked to use *kulo* in sentences:

- (25) Ba-hambe ku-lo udaka  
 2-walk.IMM.PST LOC-1.DEM muddy.grounds  
 ‘They walked on muddy grounds.’

Regarding the mapping between form and meaning, an interesting question for the analysis concerns the locus of the ordering relation. Is it plausibly encoded in the preposition ‘on’ or does the presence of a standard phrase license a covert element that introduces the greater-than relation? While we leave the details of the analysis for future work, we briefly discuss here one difference between the two comparatives that is also relevant for their semantic analysis: although the storyboard did not test *less-than* comparatives, it is worth noting that to express the *less-than* relation in Ndebele, only the locative comparative is acceptable (26a), and the EXCEED-type comparative is not (26b).

- (26) a. U Verna um-fitshane ku-lo Cecilia.  
 1 Verna 1-small LOC-1.DEM Cecilia  
 ‘Verna is shorter than Cecilia’  
 Lit.: ‘Verna is small on Cecilia’
- b. #U Verna um-fitshane u-kwedlul-a u Cecilia.  
 1 Verna 1-small 1SM-exceed-FV 1 Cecilia  
 Intended: ‘Verna is shorter than Cecilia’

Examples of the locative and EXCEED-type comparative are in (27a) and (27b) respectively. Examples of the locative comparative in the Ndebele narration of *The Twin Dilemma* are found in Panels F, H and I. EXCEED-type comparatives in the storyboard were produced for Panels D, E, G, K and L.

- (27) a. U Marilyn um-dala ku-la u Verna.  
 1 Marilyn 1-old LOC-1.DEM 1 Verna  
 ‘Marilyn is older than Verna.’  
 (Lit.) ‘Marilyn is old on Verna.’
- b. U Marilyn um-dala u-kwedlul-a u Verna.  
 1 Marilyn 1-old 1SM-exceed-FV 1 Verna  
 ‘Marilyn is older than Verna.’  
 (Lit.) ‘Marilyn is old, exceeding Verna.’

(Both pieces of data elicited by way of translation task)



Turning to the semantics of the two comparative constructions, the examples from the storyboard allow us to propose an initial analysis. The EXCEED-type comparative in Panel G supports a differential measure phrase (*ngama sentimitha amabili* ‘by two centimetres’). Only an analysis that makes reference to degrees and explicitly encodes the ordering relation with dedicated morphosyntax allows for differential measure phrases. Additional evidence for such an analysis (that is, a degree-ful language and the use of the explicit strategy) in the case of the locative comparative comes from the differential degree question produced for Panel F.

In light of the more frequent occurrences of the EXCEED-type comparative, the data may be taken to suggest a preference for this kind over the locative comparative. This echoes the distinction between primary and secondary constructions that Stassen (1985) introduces, although the storyboard does not provide comprehensive enough results to commit to the EXCEED-type as a primary construction and the locative comparative as a secondary construction since both seem to be available, and acceptable. Indeed, in follow-up elicitation for Ndebele using individual panels as context, we confirmed that where a locative or EXCEED-type comparative was given, the other would also be acceptable. However, RG mentioned that due to it being a story, she mainly opted for the EXCEED-type comparative. The reason for this could be the associated register, but this has not been closely examined. We conclude that both types of comparatives can be used interchangeably in expressing the greater-than relation.

Examples that were given as a response to the differential degree question prompt<sup>11</sup> (Panel F) are shown in (28a) and (28b), using the EXCEED-type comparative and the locative comparative respectively, demonstrating both are allowed. Notably, the phrase *how much* occurs between the gradable predicate and *ukwedlula* ‘exceed’ and *kulo* ‘on/in’. Follow-up elicitations and further research are necessary to establish whether this can occur in other structures, for example can the measure phrase in a differential comparative also occur between the gradable predicate and *ukwedlula* ‘exceed’ or *kulo* ‘on/in’?<sup>12</sup>

- (28) a. U Cecilia mude oku-nganani u-kwedlul-a u Verna?  
 1 Cecilia 1SM.tall 15-how much 1SM-exceed-FV 1 Verna  
 ‘How much taller is Cecilia than Verna?’
- b. U Cecilia mude oku-nganani ku-lo Verna?  
 1 Cecilia 1SM.tall 15-how much LOC-1.DEM Verna  
 ‘How much taller is Cecilia than Verna?’

Beyond the comparative proper, we can offer the following observations about comparison constructions in the language: regarding the positive construction, Panel A elicited the base form of the gradable predicate. When this gradable concept is used in an attributive position, for example ‘a big house’, it follows the noun in Ndebele.

Eliciting an attributive comparative through Panel I (‘a better musician’), where the gradable concept is in its comparative form rather than its base form, was not successful as the consultant produced an adverbial construction instead that translates to ‘Cecilia is able to play instruments better than Verna.’ The examples in (29a) and (29b) suggest that ‘better’ can be used predicatively,

<sup>11</sup> Note that to analyse this construction fully to determine whether this is a true differential degree question, the canonical syntax of questions in Ndebele would have to be researched.

<sup>12</sup> With thanks to a reviewer for noting the surprising structure.

but further follow-up elicitation is needed to determine whether attributive comparatives are possible in Ndebele.

- (29) a. U-baba u-se-ngcono.  
 1-father 1-now-better  
 ‘My father is feeling better.’
- b. Ku-ngcono uku-hlek-a kulo ku-khal-a.  
 it-better 15-laugh-FV LOC-1.DEM 15-cry-FV  
 ‘It is better to laugh than to cry.’

(Both pieces of data elicited by way of production task)

Neither Panel H nor Panel L elicited a distinct superlative construction but rather, the superlative interpretation is here built transparently from a comparative, namely ‘It is he who is tall on both of them’ (Panel L) and ‘He exceeds all of them in eating’ (Panel H). For the equative in Panel J, Ndebele uses vocabulary that translates to ‘similar’ or ‘same’ and a construction that translates to ‘They are very pretty in the same way.’ Again, follow-up elicitation and analysis will have to determine whether the interpretation and underlying composition are comparable to the English construction.

## 6 Mandarin Chinese

### 6.1 The Story in Mandarin Chinese: Shuangbaotai Kunjing ‘Twins Problem’

The data in (30) detail the narration of QZ (age 20) in Mandarin Chinese, transcribed by one of the authors, a native speaker of Mandarin.<sup>13</sup> The narrator grew up in Zhenzhou, China and moved to England to study a year ago. He has been learning English in school from the age of seven and speaks Mandarin at home.

- (30) QZ’s Mandarin Chinese narration
- a. <A>: Xiaohong he Xiaofang shi yidui shuang-baotai. Tamen he fumu  
 Cecilia and Verna are one.pair.(of) two-twin 3.PL.PRON with parents  
 zhu zai yizuo da fangzi li.  
 live LOC one.COUNT big house inside  
 ‘Cecilia and Verna are a pair of twins. They live with (their) parents in a big house.’
- b. <B>: Yitian tamen de fumu zai tanlun tamen.  
 One day 3.PL.PRON POSS parents PROG talk 3.PL.PRON  
 ‘One day, their parents were talking (about) them.’
- c. <C>: Baba ji<bu>qī nage shi Xiaohong nage shi Xiaofang.  
 Dad remember<NEG> which.one is Cecilia which.one is Verna  
 ‘Dad can’t recall which one is Cecilia (and) which one is Verna.’

<sup>13</sup> Please note that in Mandarin Chinese it is much more common to use Pinyin names than English ones and therefore our language consultant referred to Cecilia as Xiaohong and Verna as Xiaofang in his elicitation. The translations hold the English names in the hope it will be easier for the reader to link the prompts to the translations.

- d. <D>: Baba wen **shei geng gao ne.**  
Dad ask COP-who INT ADJ.tall Q  
'Dad asked **who is the taller (one).**'
- e. <E>: Mama shuo **Xiaohong bi Xiaofang gao.**  
Mom say Cecilia BI Verna tall  
'Mom said that **Cecilia is taller than Verna.**'
- f. <F>: Baba wen **Xiaohong bi Xiaofang gao duoshao ne.**  
Dad ask Cecilia BI Verna tall how.much Q  
'Dad asked, **'How much taller is Cecilia than Verna?'**'
- g. <G>: Mama huida **Xiaohong bi Xiaofang gao liang gongfen.**  
Mom reply Cecilia BI Verna tall two.COUNT centimetre  
'Mom replied, **'Cecilia is two centimetres taller than Verna.'**'
- h. <H>: Baba xiaozhe shuo danshi **wo zui gao.**  
Dad chuckle.PROG say but 1.SG.PRON most ADJ.tall  
'Chuckling, Dad said, **'But I (am) the tallest.'**'
- i. <I>: Mama shuo Xiaohong bi Xiaofang geng shanchang yinyue.  
Mom say Cecilia BI Verna INT do.well.in music  
'Mom said **Cecilia does better in music than Verna.**'
- j. <J>: Danshi **tamen yiyang piaoliang.**  
But 3.PL.PRON same pretty  
(Dad said) **'But they are pretty (in the) same (way).'**'
- k. <K>: Mama shuo **Xiaohong bi Xiaofang chide gengduo.**  
Mom say Cecilia BI Verna eat INT+PART  
'Mom said **Cecilia eats more than Verna.**'
- l. <L>: Baba xiaozhe huida danshi **wo chide zuiduo.**  
Dad chuckle.PROG reply but 1.SG.PRON eat most+PART  
'Chuckling, Dad replied, **'But I eat the most.'**'
- m. <M>: Baba haishi fen<bu>qing nage shi Xiaohong nage shi Xiaofang.  
Dad still distinguish<NEG> which.one is Cecilia which.one is Verna  
'Dad still couldn't tell which one is Cecilia and which one is Verna.'
- n. <N>: Zhe dui shuang-baotai youle **yige juemiaode xiangfa.**  
DEM pair two-twin have one.COUNT great idea  
'This pair (of) twins had **a great idea!**'
- o. <O>: Women keyi tongguo chuan butong yanse de yifulai bangzhu nimen  
1.PL.PRON can by wear different colour AUX clothes help.INF 2.PL.PRON  
fenbian.  
distinguish  
'We can help you distinguish (us) by wearing clothes of different colours.'

- p. <P>: Baba zhongyu neng fenqing nage shi Xiaohong nage shi Xiaofang  
 Dad finally can distinguish which.one is Cecilia which.one is Verna  
 le.  
 AUX  
 ‘Dad can finally tell (now) which one is Cecilia and which one is Verna.’

## 6.2 Discussion of Mandarin Chinese

The discussion of the data elicited for Mandarin Chinese follows the same structure as the previous section: we will first describe the structure of the comparative and then make a suggestion as to its semantic analysis. Similarly to the discussion of the Ndebele data, we end the section by surveying the other comparison constructions elicited with the storyboard.

For Mandarin Chinese, *The Twin Dilemma* storyboard elicited four instances of the so-called BI-comparative that has featured prominently in the syntactic and semantic research literature (see Erlewine 2018 and references therein). This comparative schematically has the surface structure in (31), with the particle *bi* introducing the standard of the comparison. In the typology of Stassen (1985), this construction can be classified as a particle comparative.

- (31) [[<sub>subject</sub> comparee ] [[ BI standard ] gradable predicate]]

Examples of this comparative from the storyboard include the sentences prompted by Panels E, F, G, and I; they are repeated in (32)-(35) below. Note that the gradable predicate in this type of comparative remains in its unmarked form. This comparative construction can occur with differential degree questions (33) as well as in differential measure phrases (34).

- (32) Xiaohong bi Xiaofang gao.  
 Cecilia BI Verna tall  
 ‘Cecilia is taller than Verna.’
- (33) Xiaohong bi Xiaofang gao duoshao ne.  
 Cecilia BI Verna tall how.much Q  
 ‘How much taller than Verna is Cecilia?’
- (34) Xiaohong bi Xiaofang gao liang gongfen.  
 Cecilia BI Verna tall two.COUNT centimeter  
 ‘Cecilia is two centimetres taller than Verna.’
- (35) Xiaohong bi Xiaofang geng shanchang yinyue.  
 Cecilia BI Verna INT do.well.in music  
 ‘Cecilia does better in music than Verna.’

Following von Stechow (1984), Beck et al. (2009) and Hohaus and Bochnak (2020), these data support a degree-based analysis of the BI-comparative under which the grammar adopts an explicit comparison strategy. Erlewine (2018) suggests such an analysis: under his analysis, *bi* not only marks the standard of the comparison but also encodes the *greater-than* relation, as is indicated by the ungrammaticality of (37). That is, if *bi* only encodes the standard of the comparison and we assume the presence of a covert comparative operator, we would then expect a comparative interpretation of (37). However, since the comparative interpretation is actually ungrammatical, we argue the greater-than relation to be embedded in *bi* (See (36)), as Erlewine (2018) suggests (see also Grano and Kennedy 2012).

(36) Yuchan bi Mali gao.  
 John BI Mary tall  
 ‘John is taller than Mary.’<sup>14</sup>

(37) \*Yuchan gao Mali  
 John tall Mary  
 Intended: ‘John is taller than Mary.’

Note however that our storyboard (and more specifically, Panel D) elicited a different type of structure for the contextual comparative, which we repeat in (38). Here, the intensifier *geng* ‘even more, further’ seems to ultimately indicate the comparative interpretation. (The literal translation appears to mislead readers to incorrectly assume that there is an intensified comparative interpretation here, whereas the language consultant does not necessarily know if either of the twins is particularly tall.) An additional example of a contextual comparative is in (38). As we can see from the sentence elicited for Panel K in (40) below, *geng* ‘even more, further’ can also co-occur with *bi*. The semantic analysis of (38-40) would thus be an interesting topic for future research.

(38) Baba wen shei geng gao ne.  
 Dad ask COP-who INT ADJ.tall Q  
 ‘Dad asked who is the taller one.’ Lit. ‘Dad asked who is very tall.’

(39) Context: ‘Who is taller, John or Mary?’  
 Yuchan geng gao  
 John INT tall  
 ‘John is taller.’

(40) Mama shuo Xiaohong bi Xiaofang chide gengduo.  
 Mom say Cecilia BI Verna eat INT+PART  
 ‘Mom said Cecilia eats more than Verna.’

<sup>14</sup> All uncited Mandarin data is created by two of the authors (both native speakers of Mandarin Chinese).

Without going into greater detail here, Erlewine (2018)'s analysis predicts that BI-comparatives cannot be used attributively. While our storyboard has not yet elicited negative evidence, we found that Panel I failed to elicit an attributive comparative, but rather an adverbial comparative. The language consultant's responses to Panels A and N show that outside of the comparative, adjectives in Mandarin Chinese can be used in an attributive position, preceding the noun.

On the topic of different strategies for the comparative in Mandarin Chinese, it is worth noting that Mandarin also has constructions that receive an implicit analysis (see Krasikova 2008; Erlewine 2007). One such example is a conjoined comparative, shown in (40), although these were not offered by our language consultant in the *Twin Dilemma* narration.

- (41) Lisi gao, Zhangsan ai.  
Lisi tall Zhangsan short  
'Lisi is taller than Zhangsan.' (Krasikova 2008:267)

Turning to the other comparison constructions elicited by the storyboard, Panels H and L allow us to identify *zui* as a potential candidate for superlative morphology in the language. Panel J elicited *yi yang* as a potential candidate for functional morphology to express the equative, yielding a sentence that translates to 'They are pretty in the same way.' See Grano and Kennedy (2012) and Liu (1969) for data on Mandarin superlatives and equatives. Throughout the narration, the Mandarin data indicates a preference for the BI-comparative whilst utilising specific morphology for encoding the equative or superlative constructions.

## 7 Taking Stock

Here, we present an overview of results from the narrations and offer some thoughts on the methodology. We suggest that both languages' comparative constructions can be characterised as using the explicit strategy. In §5.2, we saw that Ndebele has two comparative constructions, an EXCEED-type comparative and a locative comparative. In §6.2, we briefly examined the particle comparative of Mandarin Chinese, and other morphology used to encode comparison.

We found that the storyboard *The Twin Dilemma* was successful in eliciting the majority of targeted constructions, offering data for different types of comparative constructions. In Table 2, we provide an overview of the different comparison constructions given for the Ndebele and Mandarin Chinese storyboard narrations. Through eliciting both a differential comparative and a differential degree question, we were able to form an initial hypothesis as to the semantic analysis of the comparative along the explicit-implicit distinction.

The superlative constructions provided us with the superlative morphology in Mandarin Chinese. We also found similarities in how both languages encode the equative, with both languages combining an adjective with a word that translates to 'similar' or 'same.' Finally, the targeted attributive comparative was not produced in either language, suggesting this construction could be dispreferred.

**Table 2:** Comparison constructions elicited for Ndebele and Mandarin Chinese

Construction	Panel	Ndebele	Mandarin Chinese
Adjective in positive form, used attributively	A	Noun-adjective	Adjective-noun
Contextual comparative	D	EXCEED-type comparative	Intensifier plus adjective ( <i>geng</i> ‘even more, further’)
Predicative comparative	E	EXCEED-type comparative	particle BI-comparative
Differential degree question	F	Locative comparative	particle BI-comparative
Differential comparative	G	EXCEED-type comparative	particle BI-comparative
Superlative, used predicatively	H	Locative comparative	Adjective + <i>zui</i> ‘most’
Attributive comparative (not produced)	I	Predicative locative comparative	Adverbial particle comparative with BI
Equative comparative	J	Adjective + <i>kakhulu okufananayo</i> ‘very similar’	<i>yiYang</i> ‘same’ + adjective
Adverbial comparative	K	EXCEED-type comparative	particle BI-comparative + <i>geng</i> ‘even more, further’
Superlative, used adverbially	L	EXCEED-type comparative	<i>zuiduo</i> ‘the most’
Adjective in positive form, used attributively	N	N/A	Adjective-noun

In neither narrative did the consultant struggle to remember the plot, suggesting the storyboard was interesting enough to maintain a speaker’s interest, and clear enough to convey the intended meaning. One issue that arose was remembering which twin was taller or a better musician, effectively, which twin was the comparee and which was the comparison standard. This was resolved fairly quickly by explaining that Cecilia was always first in the comparison and thus the comparee.

## 8 Concluding remarks

In this paper, we have introduced *The Twin Dilemma* storyboard and showcased two sets of data that were collected with the help of the storyboard. We hope to have shown that this storyboard is a good starting point for examining the inventory of comparison constructions in a language. It is designed to prompt the production of a variety of different types of comparison constructions, with a particular focus on different types of comparatives. The data collected will allow the linguist to form a first set of hypotheses regarding the typological classification of the morphosyntactic strategy a language employs for the comparative (following Stassen 1985) and regarding the semantic analysis of the comparative and thus the distinction between the implicit and the explicit strategy.

As with all storyboards, their use in the fieldwork setting will need to be combined with follow-up elicitation which is crucial for collecting negative evidence (see also Matthewson 2004, 2011). Some additional suggestions for follow-up elicitation include the positive construction (42) and comparatives with the less-than relation like (43), which might differ in their morphosyntax from comparatives with the positive antonym, as we have seen for Ndebele above.

(42) Dad is tall.

(43) Verna is shorter than Cecilia.

Follow-up elicitation should also include measure phrase constructions like (44) and ordinary degree questions like (45), as languages have been reported to systematically differ as to whether the gradable predicate can directly combine with a measure phrase or a question word (see Beck et al. 2009, among others). In addition, factorial phrase equatives like (46) will only be available in languages where the equative construction makes explicit reference to degree scales, just like the differential comparatives discussed above.

(44) Cecilia is nine years old.

(45) How old is Cecilia?

(46) Marilyn is twice as old as Cecilia.

On the more syntactic side, some further ideas for follow-up elicitations include another adverbial comparative as in (47a). This example ensures the comparison does not rely on quantity like (47b) from Panel K, where ‘more’ could be analysed as quantifying the complement of the verb ‘eat’.

(47) a. Cecilia runs faster than Verna.

b. Cecilia eats more than Verna.

Illustrated in (48) is another follow-up elicitation which looks at how comparisons are constructed when the comparison standard is within an embedded clause, and crucially expresses a different comparative predicate, such as *long* vs. *wide* in (48a).

(48) a. The drawbridge is longer [than the moat is wide].

b. More people live in Liverpool [than live in Manchester].

Turning to the data collected for Ndebele and Mandarin Chinese with *The Twin Dilemma* storyboard, both languages use comparatives that employ the explicit strategy to encode their greater-than comparison. Interestingly, the Mandarin narration encoded the superlative through dedicated morphology, whereas the Ndebele narration used the locative comparative and the EXCEED-type comparative for this. We hope to pursue a more detailed syntactic and semantic analysis of the comparison constructions in these languages in future research.



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