New elicitation materials for degree abstraction and a guide to their use, illustrated with Mooré*

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Abstract: In concert with typological work on the semantic properties of the grammar of degree across a diverse set of languages, a suite of cross-linguistically applicable elicitation materials has arisen. This paper adds to that body of work, contributing storyboards and other elicitation materials designed to elicit structures involving degree abstraction. The paper also shows the results of these materials for Mooré, a Gur language of Burkina Faso that has been claimed to lack degree abstraction. Along with illustrating how the storyboard can be put to use, the results provide further insight into the case of Mooré, and the status of the Degree Abstraction Parameter. The initial assessment that it lacks degree abstraction remains tenable. However, independent properties of the language can explain why the established probes for degree abstraction will fail to yield evidence for it. The variation can thus be explained without recourse to such a parameter.

Keywords: degree abstraction, Mooré, elicitation materials, comparatives, fieldwork, Gur

1 Introduction

Entities and events can in principle be measured along a vast diversity of dimensions. Some of these dimensions can be described in a single English word, like 'height', 'speed', and 'beauty'. Like many if not all other languages, however, English allows for arbitrarily complex characterization of dimensions. Consider the following variant on Russell's (1905) example:

(1) Your yacht is larger than I thought it was.

This example makes reference to a dimension of measurement corresponding to length in the speaker's mind: to measure a given object x along this dimension is to specify the (maximum) degree d such that the speaker thought x was d-long. The dimension-description can be made arbitrarily complex; consider *Your yacht is larger than I thought Zahra said it was*, or *Your yacht is larger than I thought Zahra said Okrah pretended it was*, etc.

Constructions like this one have been analyzed using the device of *degree abstraction* – a tool that languages can use in order to describe dimensions of arbitrary complexity. In a theoretical framework that makes use of Logical Form (LF) and traces, degree abstraction can be defined as a configuration at LF at which a lambda abstraction operator binds a trace that is interpreted as a variable over degrees (usually indicated as type d, for 'degree'). In the case at hand, the relevant configuration at LF would look roughly as follows:

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(2) ... than [λd_i I thought it was ~~d_i long~~]

This sort of analysis presupposes of course that the grammar of the language in question makes reference to degrees, as first suggested for English comparatives by Cresswell (1976), and assumed or advocated for in much subsequent work (e.g. Heim 1985, Kennedy 1997, von Stechow 1984). There are degree-less alternative analyses of English comparatives; Klein (1980) offers a prominent example in this category. While Klein's analysis is not widely adopted for English, it is thought to be suited to other languages. Beck, Krasikova, Fleischer, Gergel, Hofstetter, Savelsberg, Vanderelst, and Villalta (2009) posit a Degree Semantics Parameter [DSP] regulating whether a language has degree semantics; proposed examples of [−DSP] languages include Motu (Beck et al. 2009), Washo (Bochnak 2015),and Nez Perce (Deal and Hohaus 2019), among others.

Beck, Oda, and Sugisaki (2004) argue that the analysis of comparatives sketched in (2) does not apply to Japanese *yori*-comparatives. They argue that Japanese lacks degree operators of the type described there, and "probably lacks abstraction over degree variables in the syntax altogether" (p. 289). Beck et al. (2009) develop this line of argument, proposing that some languages allow for degree abstraction and some do not. The variation is controlled by the DEGREE ABSTRACTION PARAMETER (DAP). According to this view, languages may have a positive or negative setting for this parameter; a [+DAP] language has abstraction over degree variables, while a [−DAP] language does not.

To determine whether a [+DSP] language has a positive or a negative setting of DAP, a list of diagnostics has been proposed in the literature (Beck et al. 2009, 2004, Berezovskaya and Hohaus 2015, Erlewine 2018, Howell 2013). The list can be divided into those which rely on comparative constructions, including the following (to be introduced in greater detail below):

1. Comparatives with clausal embedding standards
   (e.g. *Your yacht is larger than I thought it was*)

2. Subcomparatives
   (e.g. *The door is taller than the table is wide*)

3. Attributive comparatives
   (e.g. *John wrote a longer book than Mary*)

4. Adverbial comparatives
   (e.g. *John runs faster than Mary*)

5. Negative island effects
   (e.g. *#The door is wider than the table is not*)

6. Scope interactions between comparatives and modals
   (e.g. *Mary needs to drive faster than John*)

... and those which do not:

1. Direct measure phrase constructions
   (e.g. *John is 3 feet taller than Mary*)

2. Degree questions
   (e.g. *How tall is Mary?*)

3. Degree relatives
   (e.g. *Mary is amazed by how fast John can run*)

The languages Beck et al. (2009) identify as [+DSP] and [−DAP] are Japanese, Mandarin Chinese, Mooré, Samoan, Yorùbá, and Motu. Upon closer inspection, however, many of these languages have been shown to have degree abstraction, contrary to the original classification. Relevant works include Kennedy (2009), Shimoyama (2012) and Sudo (2015) for Japanese, Howell (2013) for Yorùbá, and Gong and Coppock (2024) for Mandarin, *pace* Krasikova (2008) and Erlewine (2018); see also Li and Sun (2025). Evidence for degree abstraction has also been found in P'urhepecha (Zyman 2015), Tswefap (Clem 2019), and multiple Salish languages (Davis and Mellesmoen 2019). Taken together, these studies raise the question of whether degree abstraction may in fact be universal, and call for a more careful and rigorous method of assessing the availability of degree abstraction in a given language.

This paper presents a set of elicitation materials, including two storyboards, designed for probing the availability of degree abstraction structures through linguistic fieldwork. We present our materials in §2. In §3, we show the results of applying them to the case of Mooré (Gur), a language that has previously been argued to lack degree abstraction.

2 Elicitation Materials

We designed two storyboards to elicit degree abstraction structures. The first allows a researcher to replicate the findings reported in Beck et al. (2009), or to apply the same diagnostics to a new language. The second targets degree abstraction structures involving scope interactions. We also designed materials for follow-up interviews on both attributive comparatives and degree relatives. The full versions of the storyboards and additional materials can be found in the appendix and can be downloaded from Open Science Framework (OSF) at https://doi.org/10.17605/OSF.IO/PU27J; in this section we highlight the main constructions of interest.

2.1 Storyboard 1: Mary's Many Demands

We designed two storyboards for our study that consist of a subset of diagnostics for degree abstraction. The first storyboard targets the following degree abstraction structures from Beck et al. (2009):

- clausal comparatives (e.g. *Bill is shorter than I thought*)
- subcomparatives (e.g. *The boat is wider than Mary is tall*)
- attributive comparatives (e.g. *Bill built a smaller boat than Robert*)
- degree questions (e.g. *How tall is Robert?*)

... and additionally targets:

- adverbial comparatives (e.g. *Bill runs faster than Robert*)
- degree relatives (e.g. *Mary is amazed by how fast John can run*)

In §3, we give an example of how the sentences elicited through this storyboard could be used as part of an investigation into degree abstraction in a given language, using Mooré as a case study. We defer a detailed discussion of the motivation for these diagnostics to that section. For attributive comparatives, we designed a follow-up study, discussed in more detail in §3.1.4. These materials can also be supplemented with the storyboard targeting comparative constructions presented by Empson, Ma, Weingartz, and Wu (2021).

We completed the paradigm with other degree structures that set a foundation for the interpretation of the data, although they do not directly bear on the question of degree abstraction. In particular, we elicited:

- simple positive sentences (e.g. *I like tall men*)
- adjectival comparatives (e.g. *Bill is shorter than John*)
- adverbial comparatives (e.g. *Bill runs faster than Robert*)
- superlatives (e.g. *I'm the tallest*)
- equatives (e.g. *Bill is as tall as you*)

... as well as:

- direct measure phrase constructions[1] (e.g. *Bill is 1.75m tall*)

The materials include gradable predicates with a range of syntactic and semantic properties, in order to allow a researcher to assess potential effects of variation along several dimensions: We included both adverbial and adjectival comparatives, both positive and negative antonyms, and both degree and quantity predicates (e.g. *big* vs. *many*).

We did not include sentences testing for negative island effects due to issues with this test pointed out by Gong and Coppock (2024). To explain briefly: Negative islands are observed in English sentences like the following.

(3) a. #Mary bought a more expensive book than no boy did.

b. #Mary bought a more expensive book than John didn't.

Example (4) is presented by Beck et al. (2009) to show that Mandarin displays no negative island effects.

(4) [$_{DP}$[$_{RC}$ John mai de] shu] bi [$_{DP}$[$_{RC}$ Bill mei mai de]] gui.
John buy DE book BI Bill NEG buy DE expensive
'John bought a more expensive book than the one Bill didn't buy.'
Literally: 'The book John bought is more expensive than the book Bill didn't buy.'

But this sentence has a definite description in it, and so is structurally quite different from the ones in (3). Its English back-translation is also acceptable, and this does not show that English lacks

[1] We take direct measure phrase constructions to be relevant for DSP, but not DAP, unless they are quantificational. As Gong and Coppock (2024:212) point out, "Unlike quantificational measure phrases..., a degree-denoting expression can saturate a degree argument directly through Function Application."

negative island effects. In general, examples like (4) do not show that the language lacks negative island effects. Only an acceptable example with negation in a clausal standard could show that. We are unable to imagine a context in which such a sentence could be felicitously uttered. Relatedly, given that negative island sentences are unacceptable in English, it is impractical to include them in a storyboard.[2]

The constructions we did include were woven together into a story about a beautiful woman (Mary), for whom three men (Robert, Bill, and John) are competing. They undergo various tests and as a result are compared along a number of dimensions. We acknowledge that this storyboard is quite long, and may not be possible to complete within a single session; fieldworkers may wish to shorten it or break it up over several sessions.

2.2 Storyboard 2: Two Sisters

The second storyboard was designed specifically to test scope interactions between comparatives and other scope-taking elements. As Heim (2001) showed, there are some types of scope ambiguities involving comparatives that give rise to truth-conditional effects. For sentences involving comparatives that are capable of such ambiguities, this storyboard builds up contexts to force one scope reading or the other. We considered two types of constructions where scope ambiguity is present:

- *less/fewer*-comparatives embedded under modal verbs
    - with a necessity modal: *Anna has to pay fewer coins than Julia*
    - with a possibility modal: *Pots can be less expensive than knives*
- and *exactly*-differentials (e.g. *Anna must pay exactly 2 more coins than Julia*)

The relevant theoretical background is discussed further in §3.1.3.

This story was about two women (Anna and Julia), going to the market and buying things for their families. This premise, too, affords many opportunities for comparison.

3 Application to Mooré

In this section, we illustrate the elicitation materials through a discussion of degree abstraction in Mooré, building on previous studies on the grammar of comparison in Mooré by Vanderelst (2007), reported in Beck et al. (2009). Mooré, also known as Mossi, is part of the Gur branch of the Niger-Congo family. It is one of the official languages of Burkina Faso, and is also spoken in several surrounding countries including Côte d'Ivoire, Ghana, Mali, Senegal and Togo. The number of speakers is estimated at 12,126,700 according to Ethnologue (2021), with 9,760,000 in Burkina Faso.

Our storyboard elicitations were conducted in August 2020 via video conferencing software.[3] Twelve native speakers of Mooré were recruited via LinkedIn and interviewed in six pairs. Most were located in Burkina Faso; one was located in Mali, and one in Ivory Coast. Participants were

[2] See Hofstetter 2013, Chapter 3 for a caveat regarding this empirical generalization, along with helpful discussion of negative island effects in general.

[3] The research was conducted under Boston University IRB protocol 5517X.

compensated via Western Union at $10/hour plus the cost of internet. One member of the pair was tasked with writing out the translation in a form distributed to the participants via Jotform, and the two speakers negotiated together what to write. Follow-up interviews were conducted with individual speakers in 2021 and 2022. The spellings were normalized to a consistent orthography for the purposes of this paper, although spelling variations that plausibly reflected phonological differences, such as the presence or absence of a final vowel (e.g. *banánd*/*banánde*), were maintained.

Interviews using the follow-up materials described above in §3.1.4 were conducted individually with a subset of the speakers who participated in the storyboard study via online web form. There were two versions, counterbalancing order of the internal- vs. external-correlate conditions. Two participants were recruited for each version.

3.1 Diagnostics involving comparatives

We begin with a discussion of the diagnostics involving comparatives (comparatives with clausal standards, subcomparatives, and attributive comparatives, adverbial comparatives, and scope interaction), and then move on to diagnostics involving degree questions and degree relatives. An important piece of background that is necessary to understand in the assessment of DAP in Mooré is how comparatives are formed in this language. The language is an 'exceed' language according to Stassen's (1985) classification. In particular, Mooré comparative constructions make use of the 'exceed' verb *yííd* in a serial verb construction following the gradable predicate, as exemplified in (5).[4,5]

(5) A Bill ya woko n yííd a John.
3SG Bill is long $ exceed 3SG John
'Bill is taller than John.'

This example exhibits one of three types of 'exceed'-verb constructions that Stassen (1985) identifies. The verb *yiid* very commonly appears in this serial verb construction (Stassen's exceed-1, serial verb), but it can also directly compare two nominals (Stassen's exceed-2, main verb), as in the following example:[6]

[4] Abbreviations: SG = singular, $ = serializing connector, C = complementizer, PAST = past tense, IMPF = imperfective, PFV = perfective, PL = plural, DEF = definite suffix, DET = determiner, A = affirmative, FUT = future, NEG = negation, S = subject, O = object, CL = classifier, PRT = particle, LNK = linker, FACT = factive, INF = infinitive. We use 3SG to gloss the proprial article *a* that occurs before proper names as it is homophonous with the third singular pronoun.

[5] Regarding what we are calling the affirmative marker, Pacchiarotti (2016) writes, in footnote 10, p. 66: "In the present paper I gloss -là as 'affirmative' (aff), and treat it as an allomorph of -à. The affirmative marker -à obligatorily appears on the verb if, and only if, the verb is in an affirmative declarative main clause. The allomorph -là occurs only when a set III object pronoun occurs in the verb. This same analysis was proposed by Manessy (1963). The appropriate glossing of this morpheme is, however, controversial. Alexandre (1953: 96) calls it a 'marker of indicative mood'; Peterson (1971: 112) a 'complement marker'; Canu (1974) a 'marker of realis mood'; Kabore (1985) a 'marker of modality'; and Nikièma (2003) a mark of the 'effectiveness and declaration of the process'.

[6] That *yal-m* is a noun rather than an adjective is shown by the fact that it is not preceded by a copula (unlike examples that will appear later with *yalga* 'tall'), and it is not followed by the serializing connector *n*, which is used to connect an adjective to the verb *yííd* 'exceed'.

(6) Kogl-g-ã yal-m yííd-a a Mary wóglm-ã
boat-CL-DEF wide-CL exceed-A 3SG Mary height-DEF
'The boat's width exceeds Mary's height.'

Another construction involving *yííd* that we found in our data used the complementizer *ti* rather than the serializing connector *n* to connect the two predicates:

(7) A Anna sõmb n yao wakɪre yɪbʊ̃́ tí yííd a Julia.
3SG Anna supposed.to $ pay money.unit three C exceed 3SG Julia
'Anna needs to pay three more coins than Julia.'

These cases may instantiate Stassen's third type of 'exceed' comparative (exceed-3), the subordinate type. In any case, the serializing type is far and away the most common in our data.

Other 'exceed' languages that have been explored before with regard to their degree system include Luganda (Bantu; Uganda; cf. Bochnak 2013), Yoruba (Niger-Congo; Nigeria; cf. Howell 2013), Tswefap (Narrow Grassfields; Cameroon; cf. Clem 2019), Ndebele (Bantu; Zimbabwe; cf. Weingartz 2021), Shan (Kra-Dai; Myanmar; cf. Moroney 2023), Kipsigis (Nilotic; Kenya; cf. Kouneli 2024), and Jula (Manding; Burkina Faso; cf. Struck and Kiemtoré 2024).

3.1.1 Comparatives with clause-embedding standards

In English comparatives, the standard following *than* can be a clause that itself embeds another clause, as in (8).

(8) Marie is richer than [λd I thought (she was) d-~~rich~~].
$\max(\lambda d$. Marie is d-rich$) > \max(\lambda d$. I thought she was d-rich$)$

Since the gradable predicate *rich* is embedded under the matrix verb *think*, the standard is clearly clausal. Hence degree abstraction is required to derive the complex degree description denoted by the standard clause, i.e., λd. I thought she was d-rich (Bresnan 1973, Chomsky 1977, Erlewine 2018).

Vanderelst (2007) reports that English clausal comparatives are translated into Mooré using a *sẽ*-construction, as shown in (9).

(9) A Marie ya rakãagre n yííd [mam sẽ da tẽe-d-a].
3SG Marie is rich $ exceed [1SG.S C PAST think-IMPF-A]
'Marie is richer than I thought.'

According to Peterson (1971), there are two types of *sẽ*-clauses in Mooré: relative clauses and factive nominalizations.[7] In the case of factive nominalizations, the *sẽ*-clause is akin to English *-ing* gerund. On that reading, *mam sẽ da tẽe-d-a* could be translated as 'my then-thinking'. A *sẽ*-clause can also modify a noun like a relative clause, but here there is no noun being modified by the *sẽ*-clause, so this example involves a factive nominalization. Importantly, this implies that the standard we find in (9) is nominal rather than clausal.

[7] Peterson (1971:293) gives the following *sẽ*-insertion rule where a sentential element hosting *sẽ* is dominated by a NP in both cases: "Insert *sẽ* as a right sister to the subject NP of any S which is immediately dominated by NP (i.e. it is a factive nominalization) or which is right sister to NOM under NOM."

To replicate Vanderelst's (2007) findings, we attempted to elicit comparatives with clause-embedding standards using our storyboard. We fished for different embedding verbs, including not only the propositional attitude verb 'think' but also strong and weak modal verbs such as 'have to' and 'be allowed to'. The results are consistent with Vanderelst's (2007) findings that the intended readings are expressed using the same *sẽ*-construction in the standard site.

(10) a. Prompt: 'Bill is shorter than I thought' [S1P10]

b. A Bill ya koɛɛga n yííd mam sẽ dá tɛ̃́e-d-a.
3SG Bill is short $ exceed 1SG.S C PAST think-IMPF-A
'Bill is shorter than what I thought.'

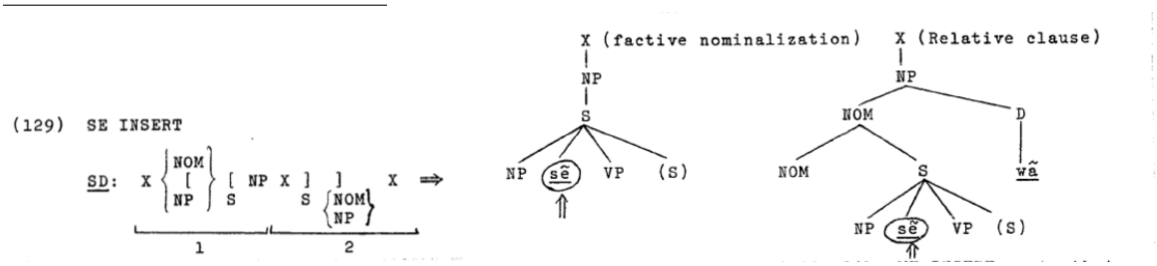
(11) a. Prompt: 'I collected more bananas than I had to!' [S1P20]

b. Mam sẽ páam-a yííd-a mam sẽ dá sɛgde n wa né.
1SG.S C collect-A exceed-A 1SG.S C PAST should $ come with
'My collecting (of bananas) exceeds what I should have come with.'

Note that (11) involves a comparison of quantity rather than degree. Quantity comparatives and superlatives present a unique set of analytical issues (Coppock, Bogal-Allbritten, and Nouri-Hosseini 2020, Hackl 2000, Penka 2015, Wellwood 2019), but these do not affect the point that the standard is a *sẽ*-nominalization in (11).

In none of our elicitation sessions did any of our participants translate these prompts using a clausal standard in Mooré. The most common strategy involved factive nominalizations similar to the ones illustrated above. Some participants used other creative strategies, like 'Wow, Bill is short!', but none of the translations used a structure that could be analyzed as involving a clausal standard. Under the assumption that there is generally a bias toward structurally analogous translations, these findings point to the conclusion that Mooré simply lacks clausal comparatives. In other words, the absence of clausal comparatives throughout all of the elicited translations of English clausal comparatives is conspicuous, and constitutes a form of indirect negative evidence.

Direct negative evidence would take the form of a judgment that a given sentence is ungrammatical. To get direct negative evidence about the existence of clausal comparatives in Mooré, then, we would have to construct an appropriate example sentence. What *would* clausal comparatives look like in Mooré, if they did exist? This question does not have a definitive answer, but we can at least report that the nominalizer *sẽ* is obligatory in (10a) and (11), according to judgments we obtained in our follow-up interviews. Could the unacceptability of *sẽ*-less versions of those sentences be due to a requirement for an embedding complementizer? Apparently not. There is a finite clause embedding complementizer *ti*, which cannot save the example:



(12) *A Bill ya koɛɛga n yííd (ti) mam dá tɛ́́e-d-a.
3SG Bill is short $ exceed C 1SG.S PAST think-IMPF-A
'Bill is shorter than that I thought.'

One possible interpretation of this variation between Mooré and English is, as suggested by Beck et al. (2009), that Mooré has a negative setting of the DAP, so that the language is incapable of forming the needed complex degree description at the standard site. However, it is also possible to account for this variation without appealing to a ban on degree abstraction. In particular, clausal standards can be ruled out in Mooré as a result of the subcategorization rule of the 'exceed' verb *yííd*, namely that it requires a nominal complement. Factive nominalizations provide a way of supplying an 'exceed' verb with a nominal complement while expressing a comparison involving a complex dimension involving propositional attitudes or modality. The availability of a non-clausal strategy for expressing this sort of comparison obviates the need for degree abstraction.

3.1.2 Subcomparatives

Comparative deletion is a type of ellipsis in which two quantities of the same sort are compared (Kennedy 2002:553):

(13) a. The galaxy contains more stars than the eye can see.
b. At that time, sea level was not as high as it later became.
c. My sister drives as carefully as I drive.

In comparative sub-deletion, quantities of different kinds are compared:

(14) a. Michael Jordan has more scoring titles than λd Dennis Rodman has ~~d-many~~ tattoos.
b. The shapes seem to be longer than λd they are ~~d~~-thick.
c. My sister drives as carefully as λd I drive ~~d~~-carelessly. (Kennedy 2002:554)

Comparative sub-deletion constructions (also known as 'subcomparatives') omit an amount or degree term from the clausal complement of *than* or *as*, leaving the associated lexical material. As shown in (14), a degree term is missing from the embedded clause in each example.

Both comparative deletion and comparative sub-deletion have been analyzed as involving *wh*-movement of a degree term (Bresnan 1973, Chomsky 1977, Heim 2001, Kennedy 1997). The *than*-phrase (*than Dennis Rodman has tattoos*) in (14a), for example, characterizes a degree d by way of a condition that it could meet: 'Dennis Rodman has d-many tattoos'. This degree description can be obtained with the help of a silent operator that serves to lambda-bind the degree argument of *many*.

(15) ... than [Op_i [λd [Dennis Rodman has d-many tattoos]]

Beck et al. (2004) use the absence of subcomparatives in Japanese as evidence against degree abstraction in that language, and Beck et al. (2009) apply this diagnostic more broadly.

Comparative sub-deletion constructions involve clausal standards, so this is another method of searching for degree abstraction in a comparative construction involving a clausal standard. The difference between this and the previous test is that the clausal standards do not themselves contain a clause-embedding verb.

Vanderelst (2007) finds that English subcomparatives like (14a) (cf. (16a)) are translated into Mooré with a *sẽ*-relative clause.

(16) a. Norbert wrote more books than λd Martine wrote ~~*d*-many~~ letters.

b. A Norbert gʊls-a liv-a rãmba tʊ yííd [lɛta a Martine sẽ gʊlse].
3SG Norbert wrote-A book.PL PL C exceed [letter.PL 3SG Martine C write]
'Norbert wrote books to exceed the letters that Marine wrote.'

The complement of *yííd* 'exceed' in (16b) is still nominal instead of clausal. This suggests that, unlike English subcomparatives, the Mooré sentence in (17) does not make use of clausal standards (which, again, require the forming of a complex degree argument out of a clause via degree abstraction).

Our storyboard contains subcomparatives like (14b) and (14c), which involve two distinct but commensurable predicates. These were translated into Mooré with nominalization constructions as well.

(17) a. Prompt: 'The boat is wider than Mary is tall.' [S1P36]

b. Koo-ma kogl-g-ã ya yaalga n yííd-a a Mari wóglm-ã.
water-CL boat-CL-DEF is wide $ exceed-A 3SG Mary height-DEF
'The boat is wider than Mary's height.'

In (17), the standard introduced by the 'exceed' verb *yííd* is a nominal formed with the nominalized degree predicate, *wóglum* 'height', instead of a clause with the degree adjective *wókò* 'long'.

The fact that a more direct translation of the English prompt is avoided by Mooré speakers is an indication that an analogous construction is not available in Mooré. Hence, translations of English subcomparatives provide no evidence of degree abstraction in the language. However, as comparative sub-deletion requires an underlyingly clausal structure, the lack of subcomparatives in Mooré can be viewed as an epiphenomenon of the lack of clausal comparatives.

Notice that even though Mooré lacks subcomparatives, it does have the ability to express what subcomparatives express, namely comparison across distinct dimensions – 'cross-dimensional comparison', as it were. It is important to keep in mind the distinction between 'having subcomparatives' and 'having the ability to express cross-dimensional comparison'. Clem (2019) offers (18) as an example of subcomparatives in Tswefap, another 'exceed'-language like Mooré.

(18) Chimi a seh n-tschege pa' nkhe Nkwehnwoh ne seh a.
Chimi FACT be.tall $-pass like rope Kuamo INF be.long like
'Chimi is taller than Kuamo's rope is long.'

While this example does express cross-dimensional comparison, it may not actually involve comparative sub-deletion. This example may instead involve either a *similative* like 'Chim is tall like Kuamo's rope is long', or a *degree relative* like 'how long Kuamo's rope is'. Ability to form degree relatives *is* evidence for degree abstraction, and therefore this example may nevertheless support the existence of degree abstraction in Tswefap, even though the example does not clearly show that the language has subcomparatives.

In fact, in assessing the presence or absence of degree abstraction in an 'exceed'-language, degree relatives are quite important to consider, because comparative standards may be syntactically

required to be nominal rather than clausal in such languages, obviating the possibility of degree abstraction structures relying on clausal standards. We will come back to the question of whether Mooré has degree relatives later.

3.1.3 Scope interaction

If degree operators are quantifiers, then they should be able to interact scopally with other scope-bearing items. They are so rare and difficult to detect that researchers had proposed grammatical systems ruling them out (Kennedy 1997, Rullmann 1995, von Stechow 1984). According to Heim (2001), however, truth-conditional effects of a scope difference can be detected in certain constructions (see also Krasikova 2010 and Beck 2012 on this issue).

Among the constructions Heim (2001) identifies as bearing detectable scope ambiguity are *less*-comparatives as in (19).

(19) a. *need > less*
[need [[fewer than Julia] [λ_1 [Anna buy t_1 bananas]]]]
'It is required that Anna buys fewer bananas than Julia.'

b. *less > need*
[fewer than Julia] [λ_1 [need [Anna buy t_1 bananas]]
'The required amount of bananas Anna must buy is fewer than that of Julia's.'

While the first reading states that Anna is not allowed to buy more bananas than Julia, the second reading says that Anna's minimal required amount is smaller than Julia's minimal required amount, but Anna is allowed to buy more bananas. As shown by the logical forms of the two possible readings of (19), to derive the second reading, i.e., the wide scope reading of the comparison, the DegP headed by the comparative operator must undergo QR to a position higher than the modal verb, leaving a trace of type *d* behind — degree abstraction.

In the storyboard, the context promoted the second reading; Anna and Julia are buying bananas for their children, and Anna has fewer children than Julia. There would be no negative consequence if Anna bought more bananas than Julia.[8] The corresponding *less*-comparatives in Mooré are expressed using the negated verb *ká tã* 'not reach':

(20) a. A Anna dá-t n da banánd tí ká tã a Julia dẽnda yé
3SG Anna want-IMPF $ buy banana C NEG reach 3SG Julia that.of NEG

b. A Anna sɛ̃gd da banánd sõore sẽ pa ta-a a Julia rẽnda
3SG Anna should buy banana number C NEG reach-A 3SG Julia the.one.of
'Anna needs to buy fewer bananas than Julia.' [S2P09]

[8] As was pointed out to us by a reviewer, experimental work by Schlotterbeck and Berezovskaya (2025) shows that the second reading of (19) is not easily accessed in German or English, even when the context promotes it. It may be useful to collect acceptability ratings of the target sentences in the context of our storyboard to check whether the prompts themselves are felicitous. But even if they are not completely felicitous in English, use of a different structure in the target language to express the context-aligned reading would suggest that an analogous structure in the target language (also) does not have the reading in question.

These circuitous paraphrases suggest that Mooré does not have English-like *less*-comparatives. However, the absence may be due to a similar reason as in Yoruba, namely that the language does not have a lexical item equivalent to English *less*.[9]

In our storyboard data, simpler comparatives of inferiority also commonly made use of negation plus *ta* 'reach'. For example, 'Bill is shorter than John' was translated by multiple pairs of consultants using negation, for example in:

(21) A Bill wogl-m-ã pa ta a John ye.
PM height-DEF NEG reach PM NEG
'Bill is less tall than John.'

This pattern suggests that the 'not reach' construction plays the role of *less* in the language.

Exactly-differentials are constructions that involve quantificational measure phrases modified by adverbs like *exactly* as shown below:

(22) Anna needs to pay exactly 3 more coins than Julia.

The sentence has two readings: a) it is required that Anna pays exactly 3 more coins than Julia; b) Anna needs to pay at least 3 more coins than Julia. The ambiguity is analyzed as a scopal ambiguity:

(23) a. need [exactly 3 more coins than Julia] [λ_1 [Anna pay t_1 coins]]
'It is required that Anna pays exactly 3 more coins than Julia.'

b. [exactly 3 more coins than Julia] [λ_1 [need Anna pay t_1 coins]]
'Anna needs to pay at least 3 more coins than Julia.'

When *need* takes scope over the comparative, we have reading (a); whereas when the comparative takes scope over *need*, we have reading (b). Reading (b), which is the wide scope reading of the comparative operator, requires a degree abstraction operator to take scope over the modal, hence can be used as evidence for degree abstraction.

We elicited the following sentences in Mooré via Storyboard 2 'Two Sisters', with English prompt *Anna must pay exactly 3 more coins than Julia*:

(24) a. A Anna sɛ́gd n yao-wa wakɩre yɩbʊ̃́ n yííd-a Julia.
3SG Anna should $ pay-DEM money.unit three $ exceed-A Julia
'Anna must pay 3 coins more than Julia.'

b. A Anna sɛ́gd n yao sẽ zeme wakɩre yɩbʊ̃́ n yííd a Julia.
3SG Anna should $ pay C be.equivalent money.unit three $ exceed 3SG Julia
'Anna should pay what is three coins more than Julia.'

Notice that these Mooré examples are missing an item corresponding to English *exactly*. In Yoruba, which is also an exceed-language, Howell (2013) argues that modified numeral measure phrases such as *exactly 5 pages* are unavailable in Yoruba, resulting the unacceptability of the corresponding of *exactly*-differentials. Without the *exactly*-item, the numeral in the sentence can receive an 'at

[9] A reviewer asks whether *ta* 'reach' patterns similarly to Yoruba *to*, which also means 'reach'. This is an interesting question that may be worth addressing in future research.

least' interpretation, one that is truth-conditionally the same as the second reading in (23b) (Heim 2001). We therefore did not find evidence from *exactly*-differentials for or against degree abstraction in Mooré.

3.1.4 Attributive comparatives

Attributive comparatives are constructions in which a comparative attributively modifies a nominal. English attributive comparatives are ambiguous between two readings; consider the following example:

(25) John bought a heavier dog than Mary.

This sentence has two sensible readings, as first discussed by Lerner and Pinkal (1995); see also Beck, Hohaus, and Tiemann (2012), Berezovskaya and Hohaus (2015), and Berezovskaya (2020). One compares the weight of the dog John bought to the one Mary bought, and the other conveys that John's dog is heavier than Mary herself. We will refer to the former (what Lerner and Pinkal (1995) call the 'wide reading') as the *external-correlate reading*, as the standard *Mary* has an external correlate, namely *John*, that does not contain the comparative morpheme. The latter reading (what Lerner and Pinkal (1995) call the 'narrow reading') is what we will refer to as the *internal-correlate reading*, with the standard *Mary* correlating with the DP [a heavier dog] containing the comparative morpheme.

The external-correlate reading of an attributive comparative is a good test for degree abstraction in an 'exceed' language, as it requires degree abstraction regardless of whether a clausal or a phrasal standard is assumed (Gong and Coppock 2024). In particular, given a phrasal analysis of comparatives *à la* Heim (1985), a complex degree gradable predicate (instead of a degree description) that is constrained by information from the matrix verb is formed via degree abstraction, as illustrated below:

(26) $\lambda d\,.\,\lambda x\,.\,x$ bought a d-heavy dog

Vanderelst (2007) reports that in a context supporting the external-correlate reading, the following sentences are not accepted, although the judgment is a bit unclear.

(27) Context (supports an external-correlate reading): Noemie bought an umbrella for 4000cfa. Martine bought one for 3000cfa.

%A	Noemie	ra-a	maasemtɩɩga	sẽ	yaa	toogo	n	yííd	a	Martine.
3SG	Noemie	buy-A	umbrella	C	is	expensive	$	exceed	3SG	Martine

Intended: 'Noemie bought a more expensive umbrella than Martine did.'

(28) Context (supports an external-correlate reading): Noemie bought a 90cm long umbrella. Martine bought a 60cm long one.

#A	Noemie	ra-a	maahamtɩɩ-woko	n	yííd	a	Martine.
3SG	Noemie	buy-A	umbrella-long	$	exceed	3SG	Martine

Intended: 'Noemie bought a longer umbrella than Martine did.'

These findings are mixed, but tend toward the conclusion that attributive comparatives do not have external-correlate readings in Mooré.

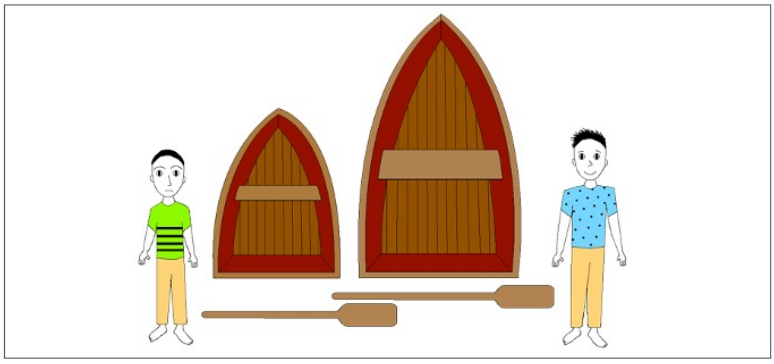


Figure 1: Image in Storyboard 1 'Mary's Many Demands' accompanying the sentence 'Robert built a smaller boat than Bill.'

Storyboard findings on attributive comparatives. We used Storyboard 1 'Mary's Many Demands' to probe further into the availability of external readings of attributive comparatives. As illustrated in Figure 1, the story involved two men, Robert and Bill, who both built a boat. Robert's boat was smaller than Bill's boat.[10] We asked for translations of 'Robert built a smaller boat than Bill', which should only have an external-correlate reading in this context. Our results were mixed. Some consultants (6/12 pairs) translated the sentence quite directly, with bare 'Bill' appearing as the complement of the 'exceed' verb, as in (29b).

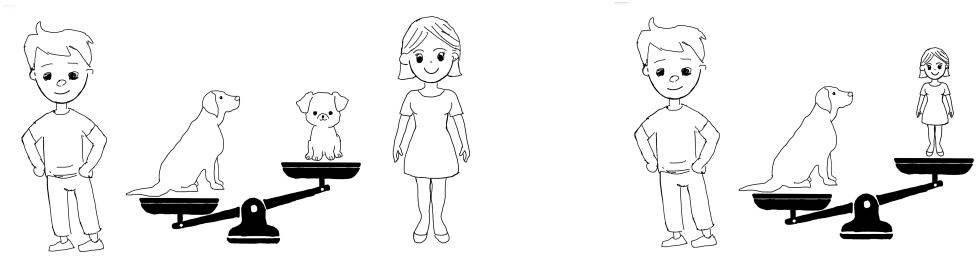
(29) a. Prompt: Robert built a smaller boat than Bill.

b. A Robert máán-a koo-ma kogl-g bila n yííd a Bill.
3SG Robert make-A water-CL boat-CL small $ exceed 3SG Bill
'Robert built a smaller boat than Bill.'

However, there is room for doubt whether the speaker was influenced by the English sentence provided in the storyboard and provided a direct but unnatural Mooré translation. Some speakers (3/12 pairs) provided translations using *rẽnda* 'the one of', as in the following:

(30) A Robert naan-a kogl-g sẽ pa ta-a a Bill rẽnda yé.
3SG Robert create-A boat-CL C NEG reach-A 3SG Bill the.one.of NEG
'Robert builds a boat that does not reach the one of Bill.'

[10] The editor points out that along the linear dimension displayed vertically in the image (height/length), Bill's boat is smaller than Bill. On this basis, the image could be construed as compatible with an internal-correlate reading, although the boat takes up a greater area and in that respect is larger than Bill. This issue could be fixed by making Bill's boat longer, to exceed Bill's height. Luckily, based on the Mooré translations we obtained, it seems that the context provided by the story independently favored an external-correlate reading through repeated comparison among the men.



Picture A (external) Picture B (internal)

Figure 2: The two pictures for 'Souleymane bought a heavier dog than Noemie.'

The speakers' effort to reconstruct the sentence with the extra nominal *rẽnda* 'the one of' casts doubt on the availability of English-like degree attributive comparatives in Mooré.[11]

Additional materials on attributive comparatives. To further probe into attributive comparatives, we developed the materials presented in §A.3. These materials not only test for attributive comparative constructions, but also more specifically for the reading of attributive comparatives that would necessitate degree abstraction, namely external-correlate readings. For example, the external-correlate reading of 'Souleymane bought a heavier dog than Noemie' is depicted in the left-hand panel of Figure 2; it can be paraphrased as 'Souleymane bought a heavier dog than Noemie bought'.

The materials in §A.3 include three gradable predicates: *heavy*, *tall*, and *expensive*. We created two pictures per gradable predicate, each depicting the scenario that targets a different reading.

In the interview, participants can be presented with a constructed sentence and asked:

- [Showing picture A] Is the given sentence a good way of describing the scenario shown in picture A? (Rating 1-5)
- [Showing picture A] If not, can you provide a sentence that describes the scenario in B?
- [Showing picture B] Can the same sentence be used in picture B? (Rating 1-5)
- [Showing picture B] If not, can you provide a sentence that describes the scenario in B?

[11] A reviewer asks whether there were other strategies. There were. For 'Robert builds a smaller boat than Bill,' there were several strategies involving nominalization, such as:

(i) A Bill sẽ páam-a yííd a Robert.
3SG Bill C collect-A exceed 3SG Robert
'Bill's collecting exceeds Robert['s].'

(ii) A Robert koo-ma kogl-g ya kidg n yííd-a Bill.
3SG Robert water-CL boat-CL is small $ exceed-A Bill
'Robert's boat is small to exceed Bill['s].'

One pair of consultants figured out a particularly simple and efficient solution:

(iii) A Robert máán-a kogl-g bila.
3SG Robert make-A boat-CL small
'Robert made a small boat.'

- [Showing picture A] Can your sentence be used to describe A?

For each sentence, we presented the speaker with only one of the two pictures at a time. See §A.3 for the full list of pictures and sentences.

Using these materials, we sent out an acceptability survey via Google forms to two speakers from the storyboard study for them to fill out on their own (asynchronously), and carried out an in-person interview using the same material with a third speaker over Zoom.

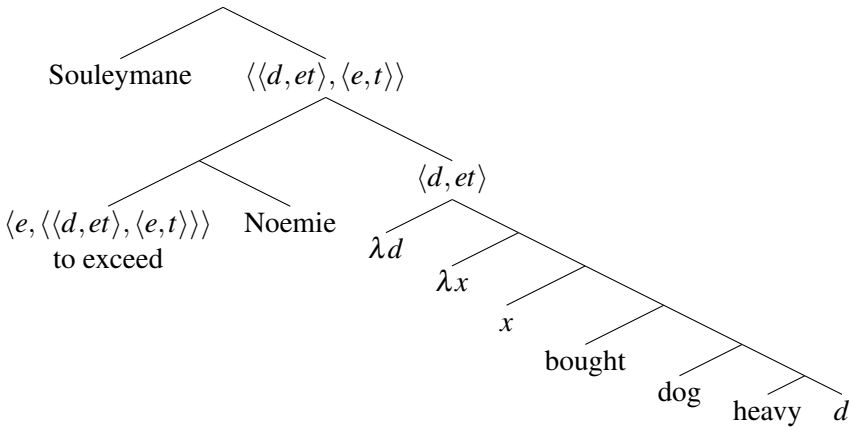
These investigations confirmed that Mooré attributive comparatives lack external-correlate readings. For the image in Figure 2, we found that the following sentence is acceptable with the internal-correlate scenario, and unacceptable with the external-correlate scenario.

(31) A Souleymane ra-a baaga zis n yííd a Noemie.
3SG Souleymane buy-A dog heavy $ exceed 3SG Noemie
'Souleymane bought a dog that is heavier than Noemie.'

Could the absence of external-correlate readings in Mooré attributive comparatives be attributed to a negative setting of the DAP? Maybe. Suppose, following much literature on the semantics of comparatives in 'exceed' languages, that *yííd* 'exceed' denotes a 3-place comparative operator, expecting a target, a standard, and a gradable predicate, in some order. Assume that that the comparative expects the standard (*Noemie* in (31)) first, and then the gradable predicate. Beck et al. (2012) argue that this analysis, roughly attributable to Heim (1985), is capable of deriving both the internal and the external readings of attributive comparatives, and that it differs in this respect from that of Kennedy (1997). For the internal-correlate reading, the predicate is the first one in the serial verb construction (*zis* 'heavy' in (31)), and everything can be interpreted *in situ*.

An external correlate reading of (31) could be generated with the help of degree abstraction. First, the standard *Noemie* undergoes QR, and then the comparative operator, together with the standard, tucks in beneath it, creating a parasitic scope configuration (see Heim 1985, Beck and Sauerland 2000, Kennedy and Stanley 2009 among others).

(32)



This LF produces an external-correlate reading, where Souleymane and Noemie are compared with respect to the property of how heavy of a dog they bought. In this derivation, the comparative operator takes scope over the VP, having left a degree trace in its initial position beside the gradable adjective 'heavy'. So degree abstraction is involved. A ban on degree abstraction would block this derivation.

On the other hand, under an analysis where *yííd* takes the gradable predicate (e.g. *zis* 'heavy') as an argument, it is mysterious why the serializing connector *n* (glossed $) appears between the two predicates *zis* 'heavy' and *yííd* 'exceed' in the serial verb construction. Pajancic (2017) suggests (indirectly, via an LFG analysis involving predicate-chaining) that the role of the serializing connector is to link two event predicates (which in a Montagovian framework would be of type $\langle v,t\rangle$), creating a complex predicate of eventualities (type $\langle v,t\rangle$). An LF for (31) is sketched below.

(33) [NP baaga [RC [$_{\langle v,t\rangle}$ [$_{\langle v,t\rangle}$ zis] n [$_{\langle v,t\rangle}$ yííd a Noemie]]]]

The corresponding syntax would be akin to coordination of two VPs, with the serializing connnector *n* as the head of the coordinating conjunction. If this analysis is on the right track, then there is no constituent containing the comparative morpheme (the 'exceed' verb, in this case) that functions as a degree quantifier. We therefore would not expect Quantifier Raising of *yííd* with its complement. Concomitantly, we would not expect external readings of attributive comparatives in this sort of language, due to the serial verb construction. No appeal to the degree abstraction parameter would then be necessary in order to explain the absence of external readings.

3.1.5 Adverbial comparatives

Berezovskaya and Hohaus (2015) argue that adverbial comparatives, as in *Mary plays the guitar better than me*, require degree abstraction. Storyboard 1 'Mary's Many Demands' includes adverbial comparatives and superlatives:

(34) Adverbial comparative
Bill runs faster than Robert.

(35) Adverbial superlatives
a. Who runs the fastest?
b. John runs the fastest.
c. I ran the fastest.

Observe that the superlatives in the English prompts involve relative readings rather than absolute readings, which has been argued to involve LF movement of the superlative element (Bumford 2018, Heim 1999): it is the runners who are being compared here. On an absolute reading, *the fastest* would refer to the fastest among some contextually relevant set of speeds, so *I ran the fastest* would be true in a scenario in which the speaker tied for fastest. No such reading is available for this sentence.

Some of the translations into Mooré that we obtained for the comparative involved a verb, followed by an adverb, followed by 'to exceed Robert':

(36) A Bill zoeta tʋlg n yííd a Robert
3SG Bill run fast $ exceed 3SG Robert
'Bill ran faster than Robert.'

It is possible that this structure involves degree abstraction, but we do not consider this unambiguous evidence for that conclusion. The problem is that it is not clear to us where *n yííd* attaches in this sentence: at the VP level ('run fast') or at the adverb level ('fast'). Under the former analysis, the sentence would be translated into English more literally as 'Bill ran fast more than Robert', and this is not a sentence of English that would require degree abstraction.

One indication that VP-level attachment is possible is that the adverb can be left out of structures like (36), as shown in one of the translations for the adverbial superlative. Superlatives are formed with a 'more than all' strategy, a combination of a comparative with a universal quantifier for the standard (very common typologically; see Stassen 1985, Bobaljik 2012, Coppock 2016).

(37) A John wudg n yííd-ã b fãã.
3SG John run $ exceed-A them all
'John runs the fastest.'
Lit. 'John runs to exceed them all.'

We leave it as a question for future research whether *n yííd* 'to exceed' can attach at the adverbial level.

We did also find superlatives containing an overt adverb:

(38) A John zoeta tʊlg n yííd-a.
3SG John run fast $ exceed-A
'John ran fast to exceed [all].'

This example also illustrates that the universal standard can be omitted in a superlative.

Furthermore, we note that some of the translations we obtained involved a nominalization of Bill's running:

(39) A Bill wudgdamẽ yííd-ã a Robert.
3SG Bill running exceed-A 3SG Robert
'Bill's running exceeds Robert's'

Superlatives elicited nominalization structures too:

(40) A John wudgdamẽ yííd b fãã.
3SG John running exceed them all
'John's running exceeds them all.'

(41) Mam zoessan n yííd-a.
1SG running $ exceed-A
'My running exceeds [all].'

These translations differ structurally quite a bit from the prompts, perhaps suggesting that that there may be some reason to avoid a more structurally faithful translation like (36).

3.2 Diagnostics not involving comparatives

The foregoing subsection reviewed the diagnostics involving comparatives: comparatives with clause-embedding standards, subcomparatives, attributive comparatives, and adverbial comparatives. We turn now to diagnostics that do not involve comparatives: degree questions and degree relatives.

3.2.1 Degree questions

Degree questions are prime candidates for degree abstraction. Questions in English involve overt movement that can be analyzed in terms of lambda abstraction (Groenendijk and Stokhof 1984, Heim 2001, Heim and Kratzer 1998), so a degree question should involve degree abstraction. In a degree question like (42), for example, the *wh*-phrase *how* leaves a trace at the degree slot next to the degree predicate *tall*. Movement of *how* triggers lambda abstraction, giving us a degree abstraction configuration.

(42) How tall is John?
[Q [λ_1 [John is t_1 tall]]]

Recognizing this, Beck et al. (2004) argue that Japanese lacks true degree questions, in support of their claim that degree abstraction is absent in Japanese (see Sudo 2015 for an opposing viewpoint).

Beck et al. (2009) argue Mandarin also lacks English-like degree questions. But as Erlewine (2018) points out, Mandarin is a *wh*-in-situ language, and this complicates the reasoning. Granted, there may be covert *wh*- movement at LF, but analyses of questions in Mandarin differ as to whether they assume covert *wh*- movement. Without *wh*- movement, there is no abstraction.

Mooré is also a *wh*-in-situ language. Here is a question-answer pair, showing that the question word and the part of the sentence that answers the question are in the same position:

(43) a. Yãm boondá wã tí bwẽ?
2PL call that LNK what
'What do you call that?'

b. Tónd boondá wã tí kúmba.
1PL call that LNK eggplant
'We call that eggplant.' (Lehr, Redden, and Balima 1966)

Wh- in situ appears to be the norm. The basic course in Mooré developed by the Foreign Service Institute (Lehr et al. 1966) has many examples of *wh*- questions in sample conversations, and they all have the *wh*- word *in situ*.

The degree questions elicited by Vanderelst (2007) are also *in situ*:

(44) A Martine ya-a wóko wãn-wãna?
PM is-A long how.much-how.much
'How tall is Martine?'

The questions we elicited through our storyboard had the *wh*- word *in situ* as well:

(45) a. A Robert wógl-m-ã ya wãna?
3SG Robert long-CL-DEF is how.much
'Robert's height is how much?'

b. A Robert ya wók wã́n-wã́n to?
3SG Robert is long how.much-how.much PRT
'Robert is how tall?'

Since there is no overt movement in these constructions, they do not provide any clear evidence for degree abstraction.

Interestingly, however, there is a construction in which the *wh* word can be fronted, along with the particle *la*, a copula that has also been analyzed as a focus marker (data from a follow-up interview with one of our consultants):

(46) Bwẽ la fo wa nɛ?
what is you bring with
'What did you bring?'

(47) Da-bʊr la buss-a loogd-a?
day-which is bus-DEF leave.IMPF-3SG
'On which day will the bus leave?'

But the degree *wh-* word *wãn(e)* 'how much' is accompanied by a preceding copula when it is fronted before *la*:

(48) Yaa wãn la kada soaba?
is how.much is this one
'How much is this one?' (Peace Corps Burkina Faso 2006)

This construction appears to be a cleft, with two short clauses joined together. The *wh-* word is *in situ* in the first of these clauses. Example (48) does not provide evidence for degree abstraction in the language, but the variation in copula usage raises questions that could potentially bear on the issue: Do the copula-less *la*-questions involve true *wh-* movement, or are they cleft constructions too? Is the copula obligatory in degree questions with *wãn(e)*? If so, could that be due to a ban on degree abstraction, preventing *wãn(e)* from participating in overt *wh-* movement? We leave these questions for future research.

3.2.2 Degree relatives

Howell (2013) uses degree relative constructions to demonstrate that Yoruba has binding of degree variables. Although comparative deletion (e.g. *The table is wider than the door is ~~wide~~*) is not permitted in Yoruba, Howell (2013) argues that clausal comparatives can be constructed using degree free relatives as illustrated below:

(49) Tabili yii gun ju bi omo yii se ga to lo.
table this be.long exceed how child this Q be.tall reach STD
'The table is longer than how tall the child is.' (Howell 2013:281)

As Howell (2013) points out, the *wh*-pronoun *bi* in (49) would undergo movement to the specifier of the relative CP under typical semantic accounts of *wh*-pronouns. The movement of *bi* would result in binding a trace of a type *d* argument, representing an instance of degree abstraction.

Since degree relatives provide positive evidence for degree abstraction in similar exceed-languages, we take them as a promising place for testing degree abstraction in Mooré. (The results reported in this section are not associated with any particular elicitation materials; they are based on simple text-based translation tasks.) The first place we looked at is degree free relatives. As shown in (50), degree free relatives are not translated into Mooré using an overt *wh*-item.

(50) Prompt: 'John will become however tall his father hoped he would become'
A John na yii wook wa a ba wã sẽn tẽe-d-a.
3SG John FUT be tall like 3SG father DET C think-IMPF-3SG
'John will be tall like what his father thought.'

The word *wa* is a similative, meaning 'like'; our consultant also mentioned that it has the same meaning as French *comme* ('like'). The morpheme is found in translations of adverbial equatives as well.

(51) Prompt: 'John runs as fast as birds fly.' [S1P27]
a. A John wudg-d-a wa luiili n yík-d-a.
3SG John run-IMPF-3SG like bird.PL $ fly-IMPF-A

b. A John zoe-t-a wala luiili sẽn yik-d-a.
3SG John run-IMPF-3SG like bird.PL C fly-IMPF-3SG
'John runs like birds flying.'

Further data with gradable adverbs confirms that Mooré speakers do not use *wh*-constructions in translating English degree free relatives. As shown below, the Mooré sentences provided by our consultants are formed with relative clauses involving a nominalized structure headed by the determiner *wã* and the morpheme *toto* 'manner'.

(52) Prompt: 'Mary is amazed by how fast John can run.' [S1P28]
a. a John n sẽ wudg toto wã ling-a a Mary.
3SG John $ C run manner DET surprise-3SG 3SG Mary
'The way John ran surprised Mary.'

b. t':a Mary sũur-ã yaa nõogo né a John n zoe-t toto wã.
C:3SG Mary heart-DEF is delicious with 3SG John $ run-IMPF manner DET
'and Mary is happy with the way John runs.'

It is plausible that the absence of *wh*-constructions in translations of degree free relatives is due to a general absence of free relatives in the language. Our further attempts to elicit non-degree free relatives in the language did not produce *wh*-constructions either.

(53) Prompt: 'I will eat what you will make.'
Mam na dii fo sen na maan a saba.
1SG FUT eat you C FUT make 3SG one
'I will eat the one that you will make.'

(54) Prompt: 'I will visit where you were born.'
Mam na wa bãng-a fo sẽn dog-ẽ wã.
1SG FUT come know-3SG you C born-LOC DET
'I will come to discover your birthplace.'

4 Summary and Conclusion

This paper has presented a new set of elicitation materials specifically designed to elicit structures involving degree abstraction. Five diagnostics for degree abstraction are included, including (i) comparatives with clausal embedding standards, (ii) subcomparatives, (iii) attributive comparatives, (iv) degree questions (v) degree relatives, and (vi) scope interaction. These elicitation materials were then tested against a known case in the literature, namely Mooré. The application of these materials has shed further light on the issue of degree abstraction as related to the case of Mooré, the value of positing the DAP as a parameter, and methodology in cross-linguistic semantics.

Is there degree abstraction in Mooré? The answer is likely to be "no", as none of the diagnostics turned up any clear evidence for degree abstraction in Mooré. However, are we in a position to really parameterize degree abstraction? The answer seems to be "no" too, as in each case, the absence of the construction could be due to independent factors. In particular, the lack of comparatives with clausal standards and subcomparatives are predicted by the subcategorization rule of the 'exceed' verb *yííd*. Therefore, not finding such comparatives does not motivate the proposal of DAP. Similarly, the absence of external-correlate attributives can be attributed to the semantic properties of serial verb constructions, and the failure to find degree relatives and scope interactions may be due to the lack of certain lexical items in the language.

This case study brings out a number of related larger, general points about methodology in cross-linguistic semantics. When the variable of interest is whether a given construction exists or not in the language, several challenges arise. One challenge is defining the construction. For example, what is a subcomparative? How many aspects of the construction can differ across languages before it's not the "same construction"? Clearly, as Beck et al. (2009) discuss, just because a sentence can serve as a translational equivalent for another doesn't mean that it instantiates the same construction. Different languages have different strategies for expressing, say, comparison; can, say, subcomparatives in principle be expressed using any of these strategies? As we have seen, the answer is not uniformly "yes"; if the strategy for expressing comparison does not involve a clausal standard, then the strategy cannot be used to form subcomparatives.

How to show that a construction is absent is another general challenge that this case study forces us to grapple with. Just because a storyboard with one construction fails to elicit the "same construction" in the target language of course does not mean that the construction does not exist. We maintain, however, that storyboards can provide indirect negative evidence. Especially when the source text is written out and visually accessible to the consultant during the interview, it is reasonable to expect consultants to have a default bias in favor of the structure of the source text. When six

out of six pairs of consultants avoid a construction contained in the prompt and instead creatively repackage the information, it starts to look improbable that a structurally analogous translation is available in the language.

Negative evidence can show more directly that a given strategy is unavailable. In the case of attributive comparatives, we supplemented the storyboard translations with acceptability judgments for sentences relative to pictures. The latter have the potential to provide direct negative evidence. The two data-collection strategies have complementary strengths, and can be paired together to paint a clearer picture than either could paint alone.

Another general challenge is in interpreting the absence of a given construction, supposing that it can indeed be shown to be absent. It is important to keep in mind the grammatical ecosystem of the language, as independent factors that may rule out the constructions under consideration. The case study of Mooré brings this out quite clearly; the absence of degree abstraction constructions is not conspicuous in light of general features of Mooré grammar. In other words, once independently motivated features of the grammar and vocabulary are taken into consideration, there is no additional explanatory gain from positing a degree abstraction parameter, as far as we can see. Still, even if it is not necessary to take as an axiom, the presence or absence of degree abstraction may be a dimension along which languages do vary.

For researchers interested in this topic, we hope we have provided a valuable set of elicitation materials and have illustrated how the resulting data can be interpreted, with specific application to Mooré. The results have refined our understanding of this particular case, solidifying previous results and placing them in the context of the syntax and semantics of Mooré degree system. As the evidence for the DAP continues to dwindle, we seek to encourage further scrutiny on the question of whether degree abstraction is a parameter along which languages vary, or rather a universally available mechanism of semantic composition.

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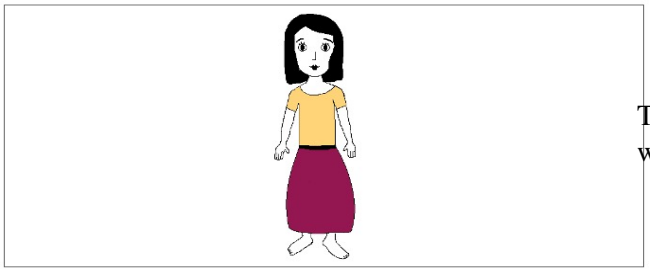
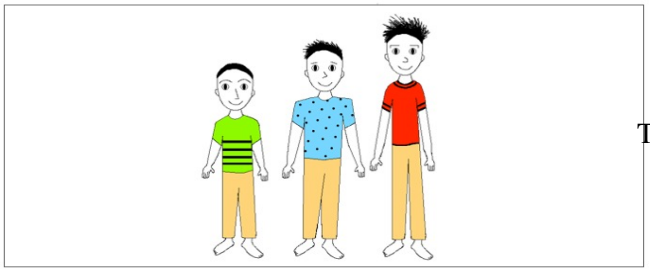
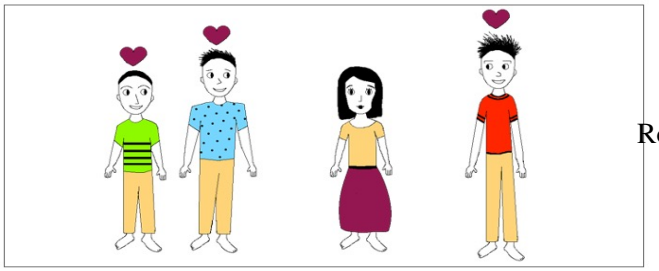
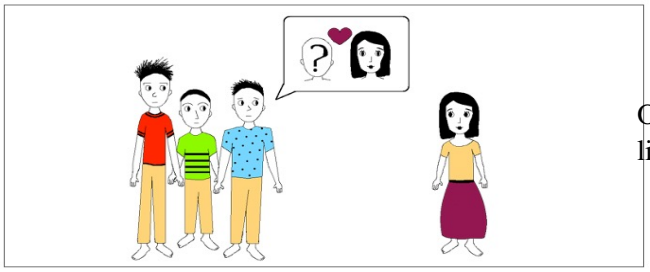
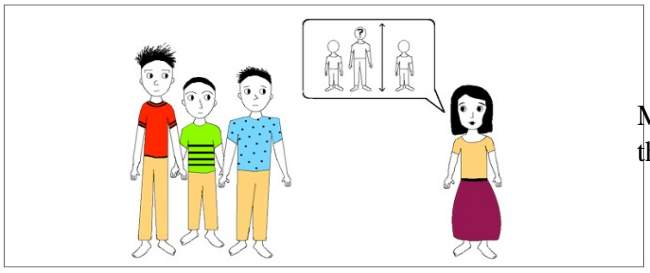
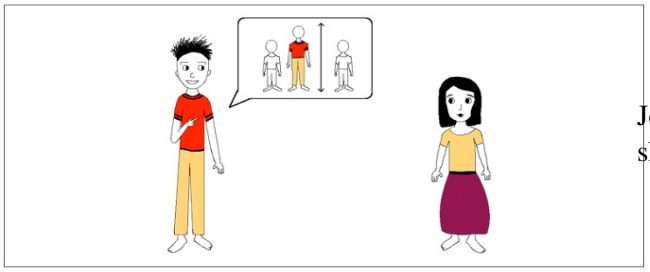
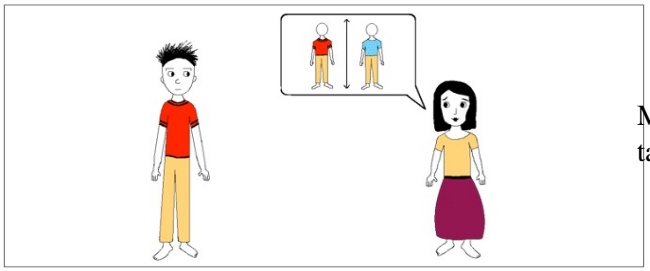
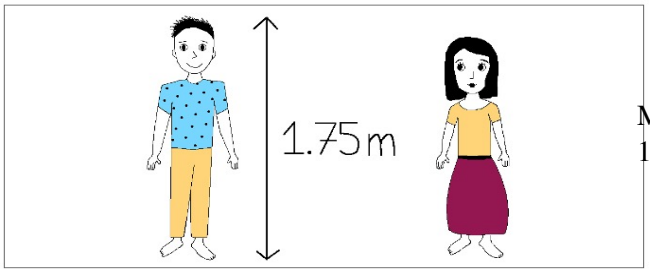
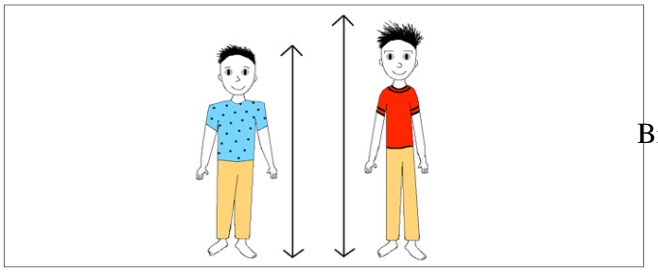
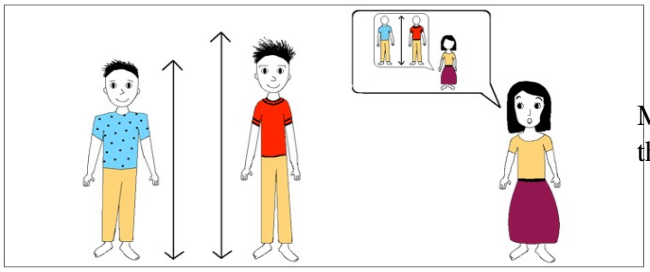
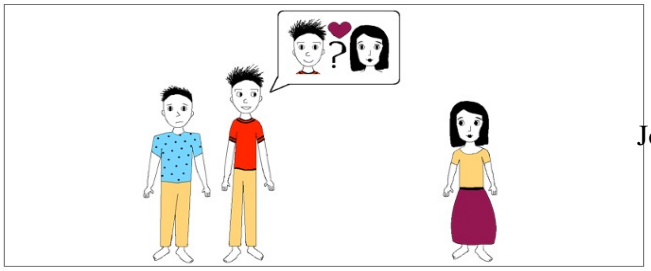
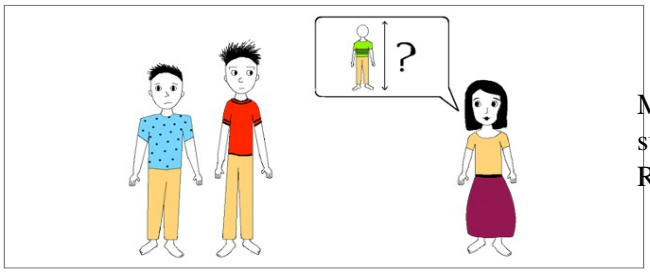
A Appendix

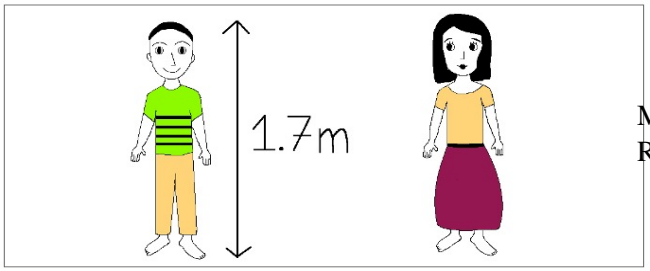
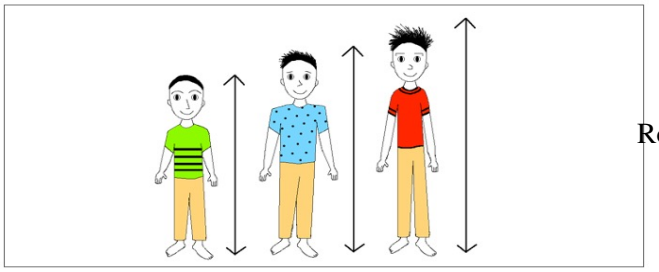
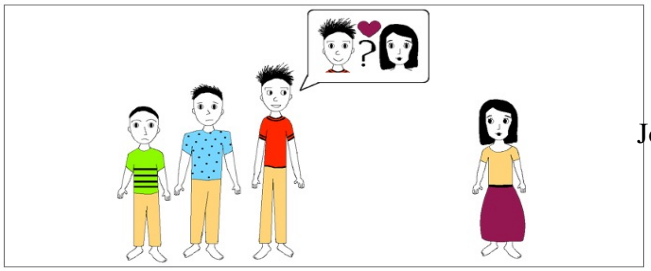
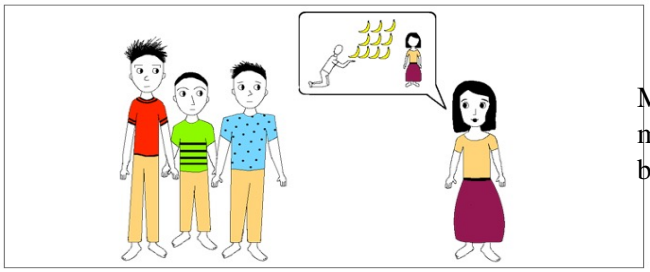
A.1 Storyboard 1: Mary's Many Demands

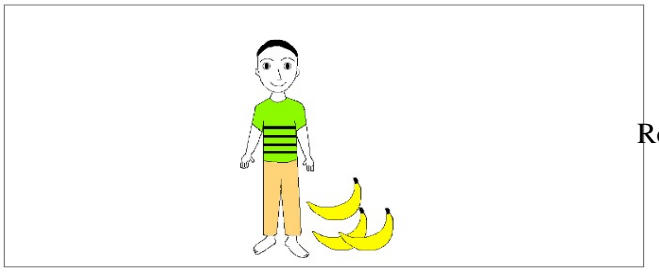
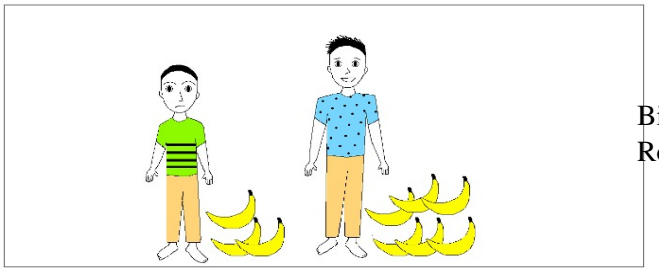
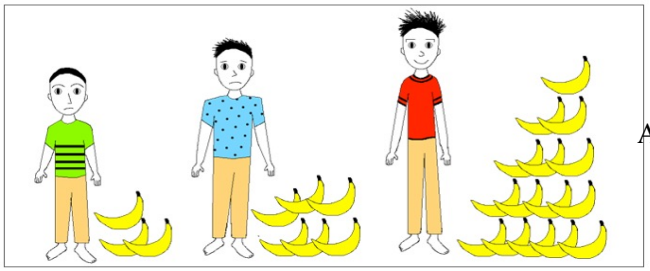
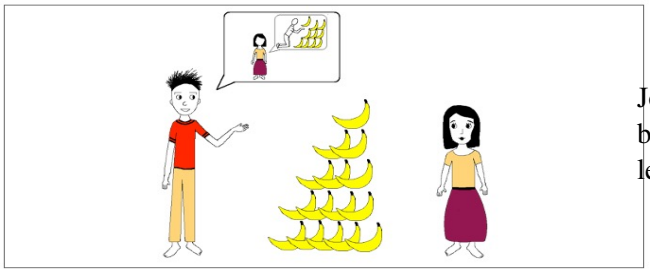
Table 1: Mary's Many Demands

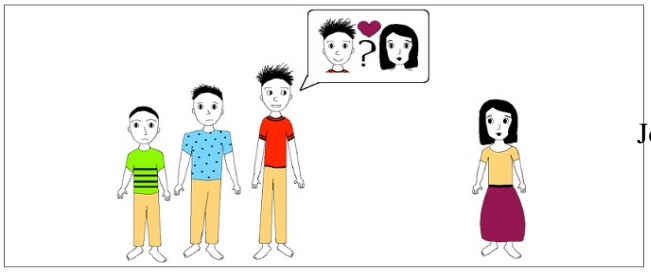
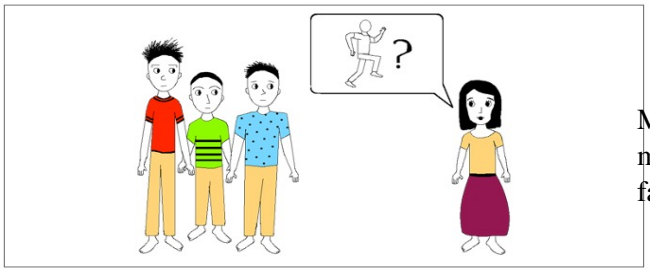
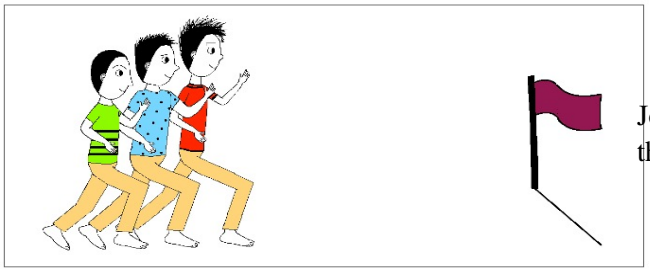
1		This is Mary. Mary is a beautiful woman.
2		These are Robert, Bill and John.
3		Robert, Bill and John like Mary a lot.
4		One day, they ask her: "Who do you like? Who do you want to marry?"

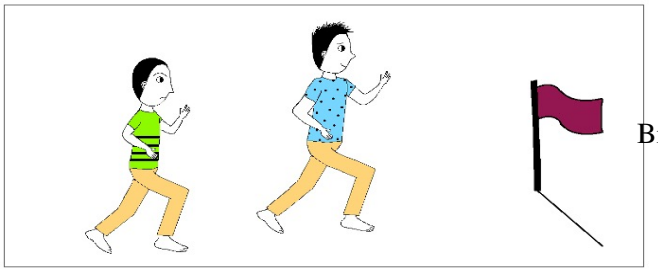
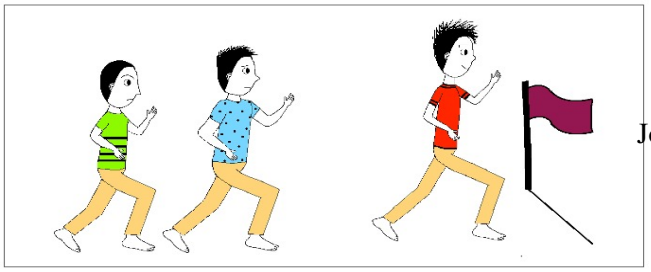
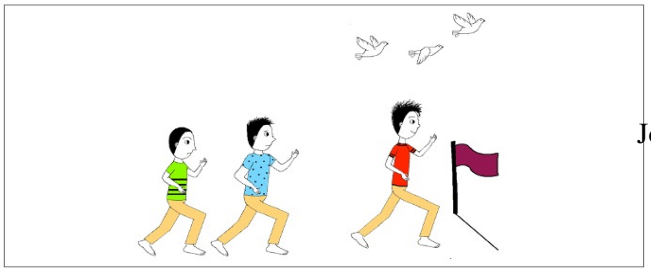
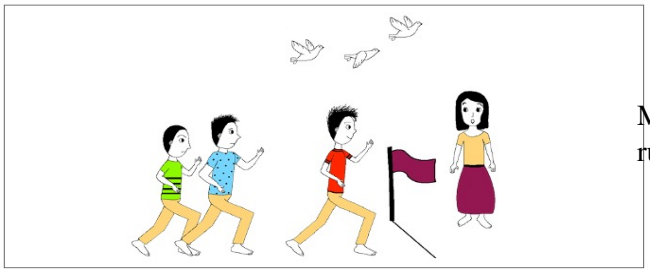
5		Mary says: “I like tall men. Who is the tallest?”
6		John says: “I am the tallest. You should marry me.”
7		Mary says: “Really? I think Bill is as tall as you.”
8		Mary measures Bill’s height. Bill is 1.75 meters tall.

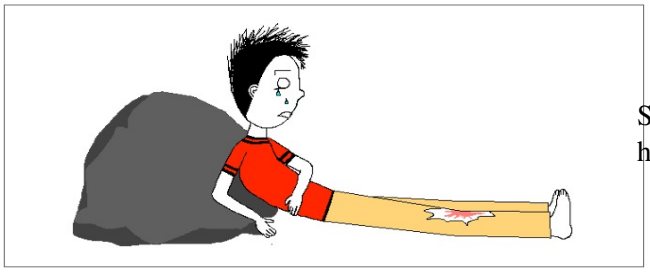
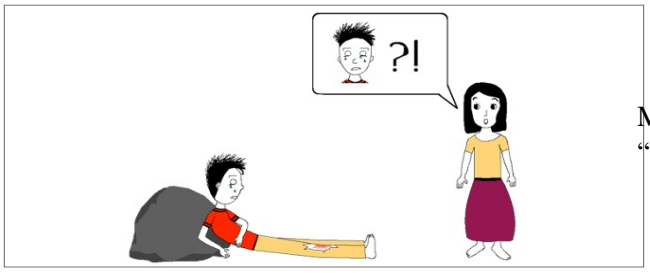
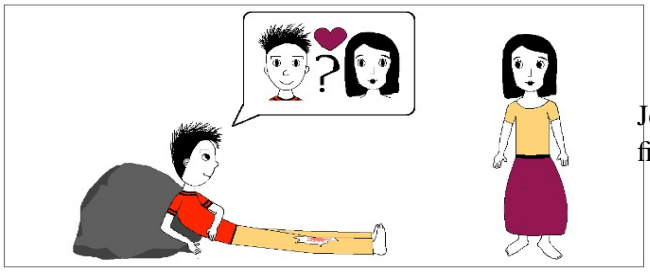
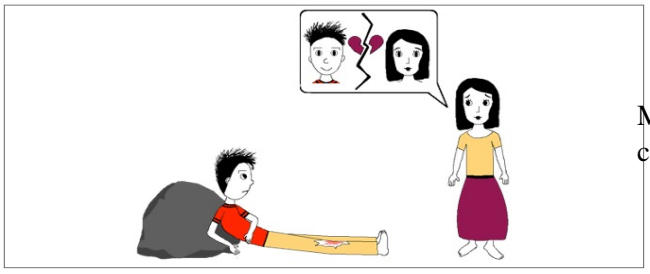
9		Bill is shorter than John.
10		Mary says: "Bill is shorter than I thought!"
11		John asks: "So do I win?"
12		Mary says: "No, I have not measured Robert's height yet. How tall is Robert?"

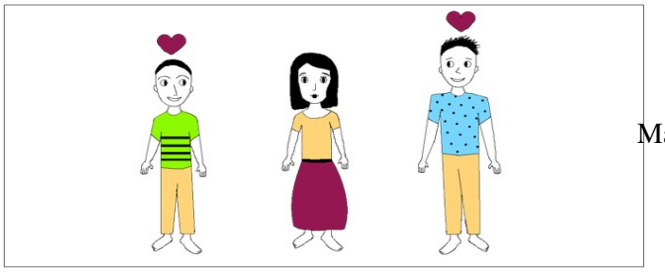
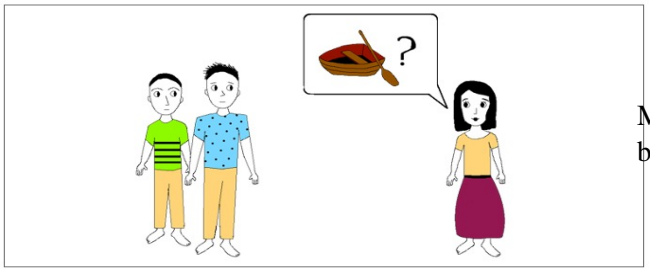
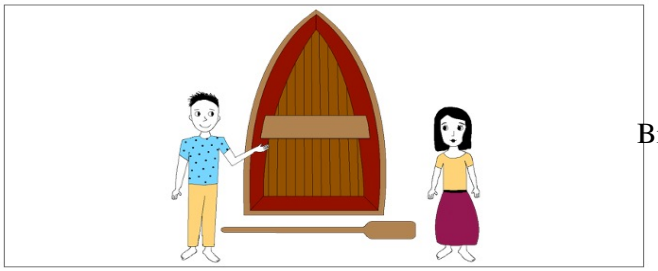
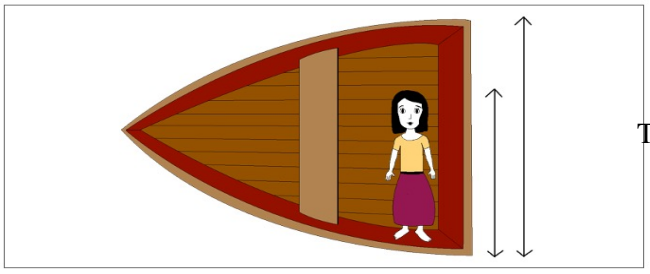
13		Mary measures Robert's height. Robert is 1.7 meters tall.
14		Robert is the shortest.
15		John asks again: "Do I win?"
16		Mary says: "No. If you want to marry me, you have to bring me at least 10 bananas."

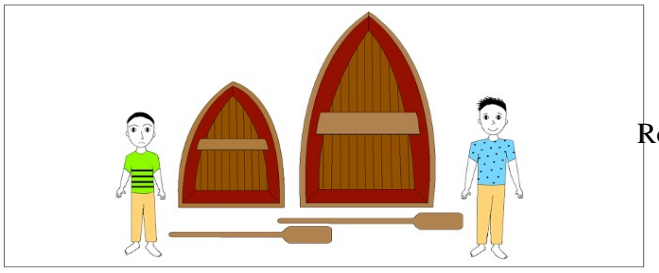
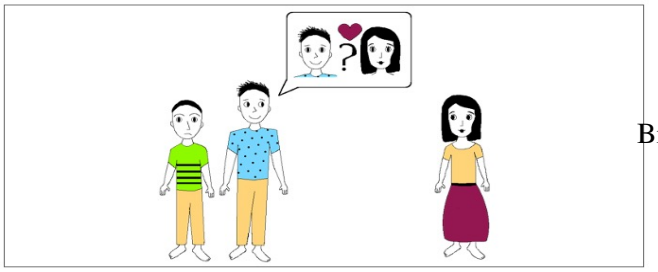
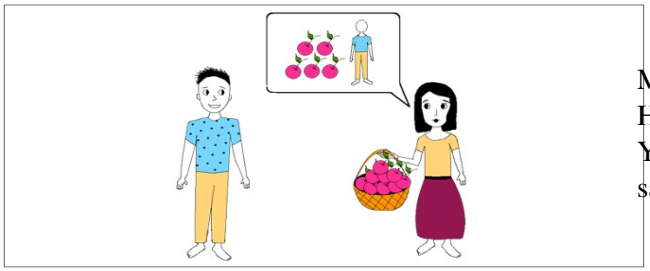
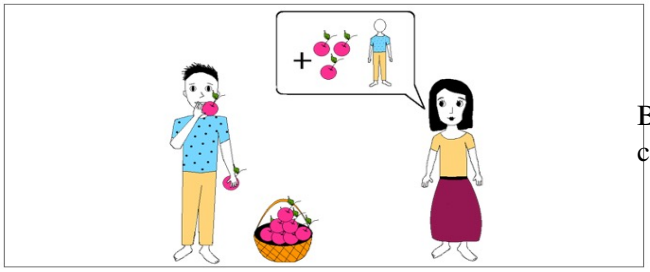
17		Robert collects 3 bananas.
18		Bill collects more bananas than Robert.
19		And John collects the most bananas!
20		John says to Mary: “You wanted 10 bananas. I collected 15 bananas. I collected more bananas than I had to!”

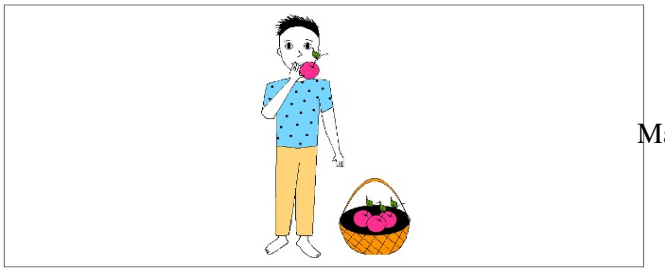
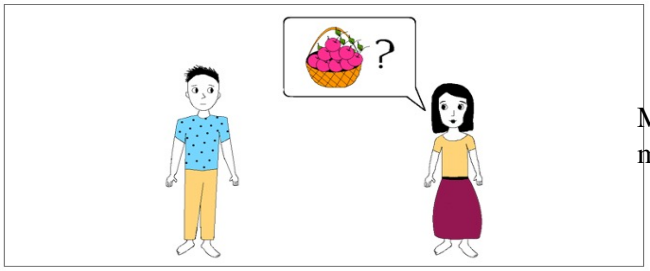
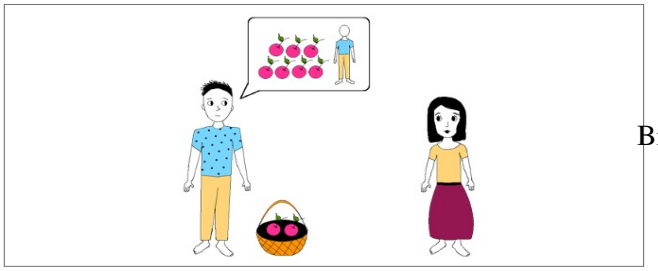
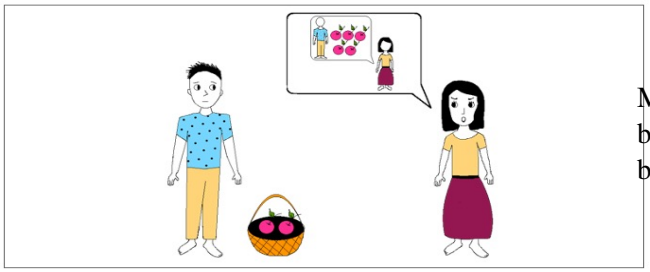
21		John asks: “Do I win?”
22		Mary says: “Not yet. My husband must run fast too. Who runs the fastest?”
23		John, Robert and Bill run as fast as they can.
24		Robert runs very fast!

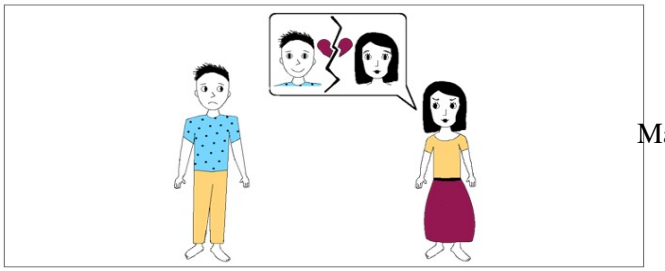
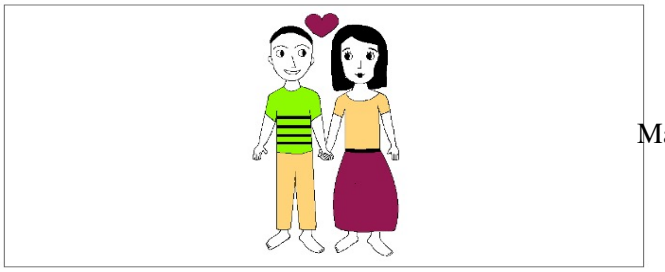
25		Bill runs faster than Robert.
26		John runs the fastest.
27		John runs as fast as birds fly!
28		Mary is amazed by how fast John can run.

29		Suddenly John falls down and breaks his leg. He cannot run now.
30		Mary runs to John. She asks him: "What happened? Are you okay?"
31		John says: "My leg hurts, but I am fine. Do I win? I ran the fastest."
32		Mary says: "No. You cannot run. I cannot marry you."

33		Mary must choose Robert or Bill.
34		Mary says: “I want a boat. Who can build the biggest boat?”
35		Bill builds a very big boat.
36		The boat is wider than Mary is tall.

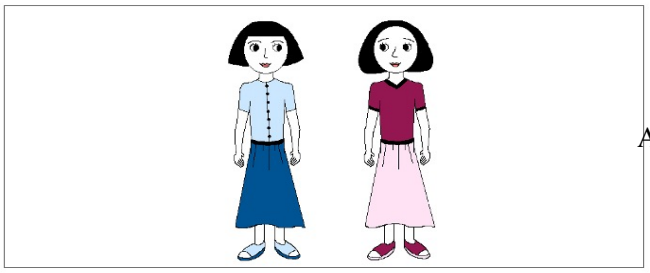
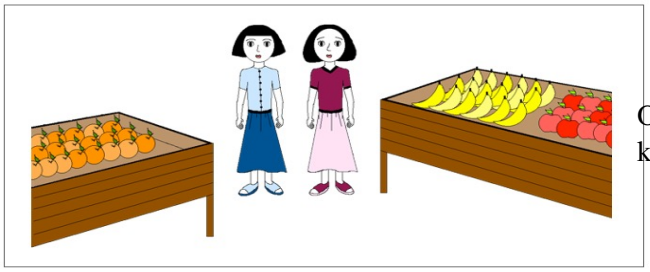
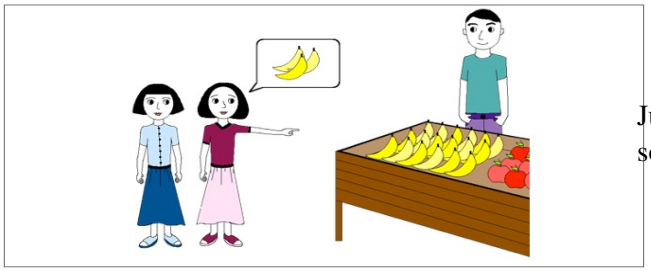
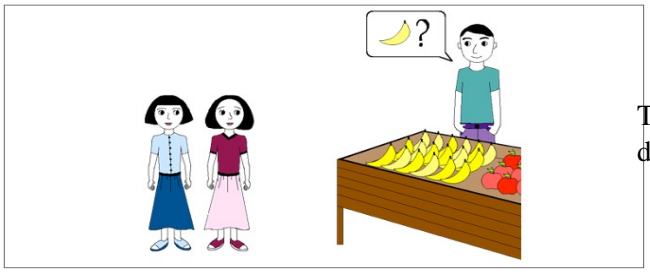
37		Robert builds a smaller boat than Bill.
38		Bill asks: “So do I win?"
39		Mary says: “Yes, congratulations! Here are my berries. I have 9 berries. You are allowed to eat 5 berries. But save the rest for me.”
40		Bill eats 2 berries. Mary says: “You can eat exactly 3 more berries.”

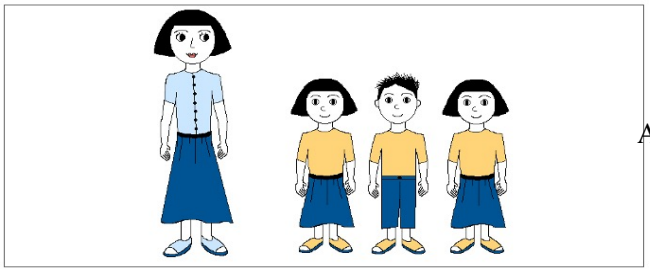
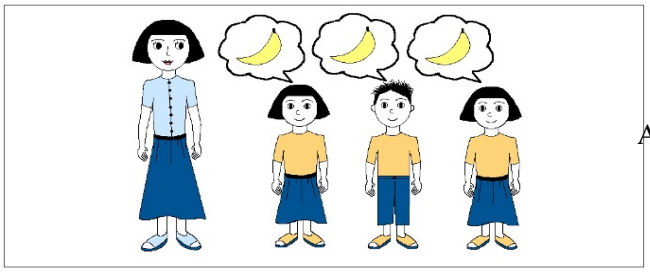
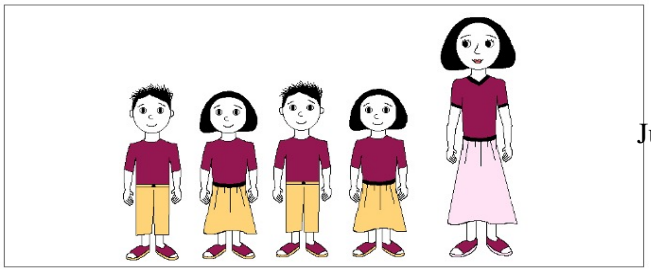
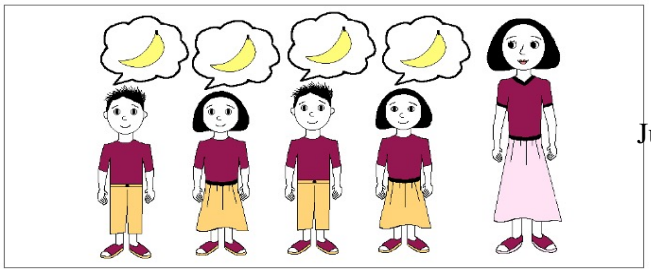
41		Mary leaves. Bill eats more berries.
42		Mary comes back. She says: “How many berries did you eat?”
43		Bill says: “Sorry. I ate 7 berries.”
44		Mary says: “I said that you can eat 5 berries, but no more! You ate more berries than you were allowed to!”

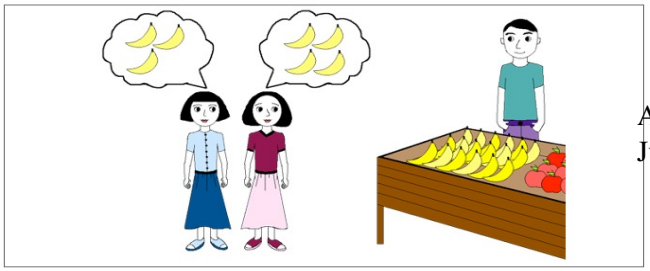
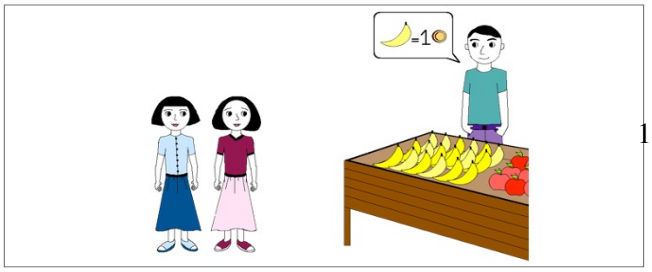
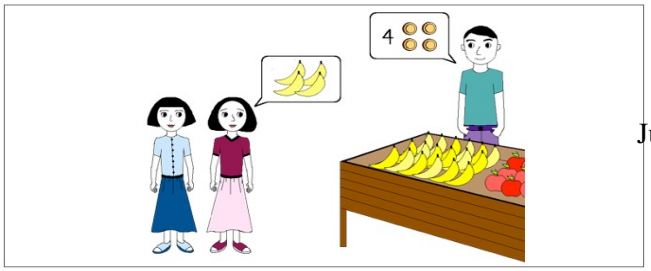
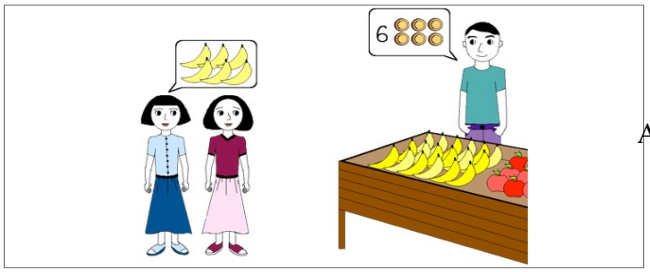
45		Mary says: “I cannot marry you!”
46		Mary marries Robert.

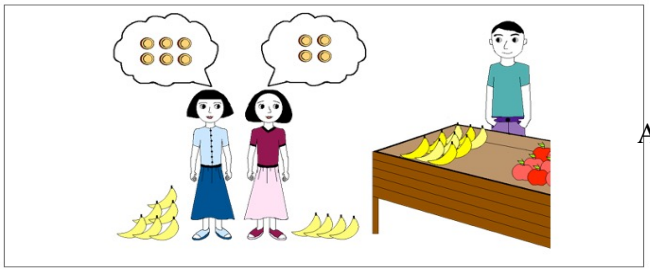
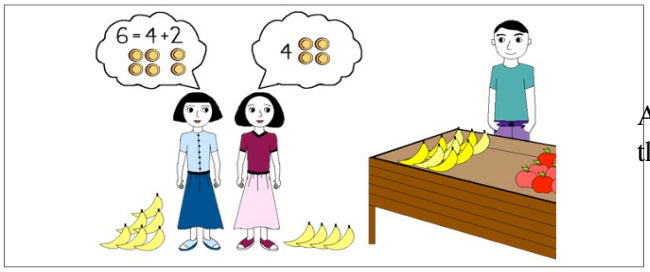
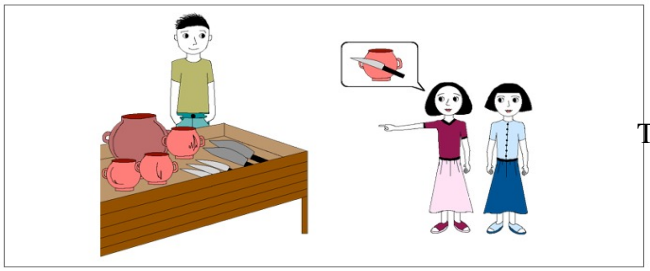
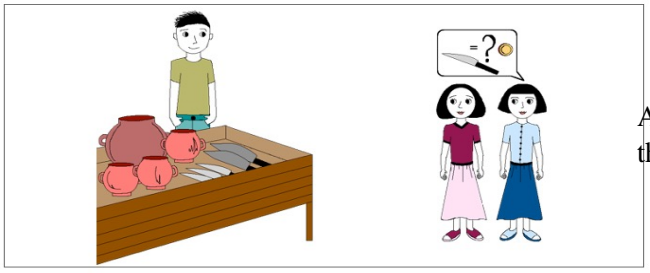
A.2 Storyboard 2: Two Sisters

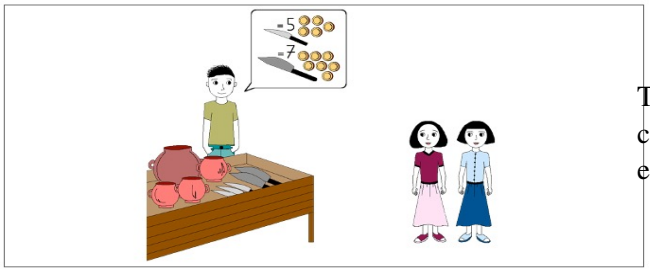
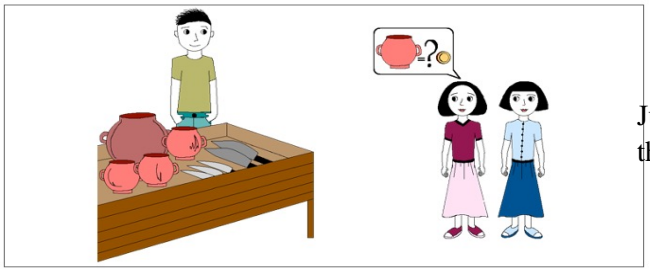
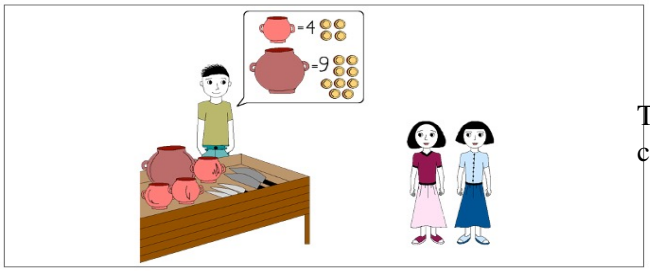
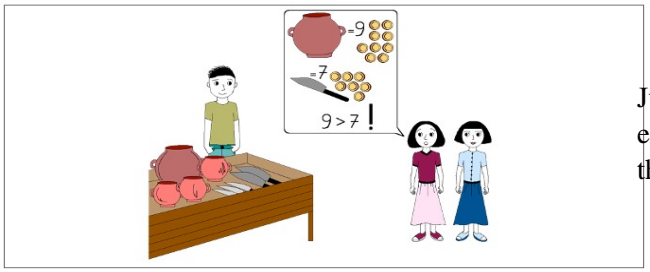
Table 2: Two Sisters

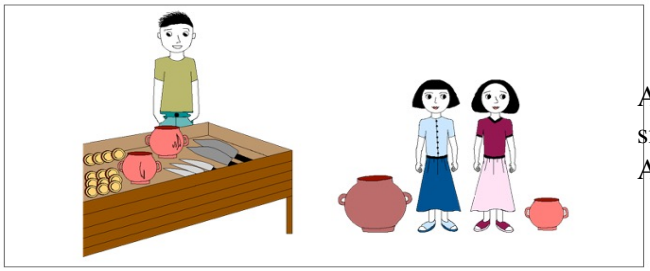
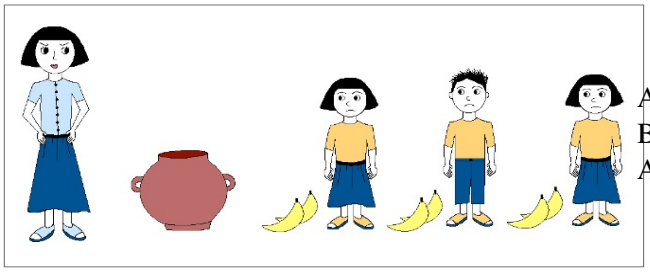
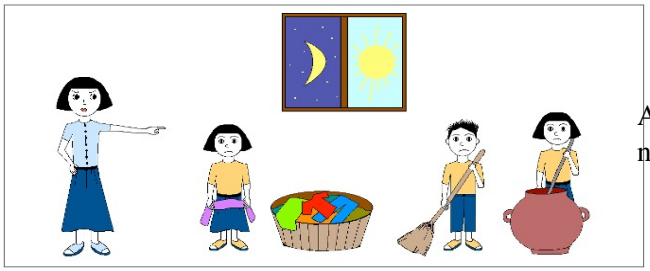
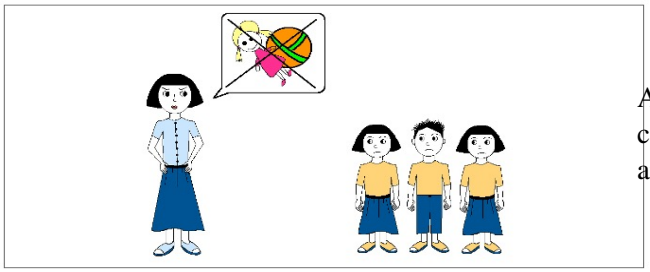
1		Anna and Julia are sisters.
2		One day Anna and Julia go to the market.
3		Julia says: “Look, bananas! Let’s buy some!”
4		The seller asks: “How many bananas do you need?”

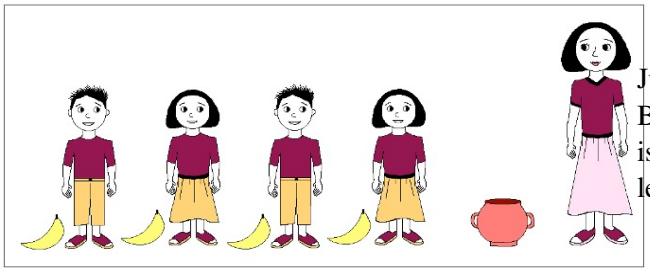
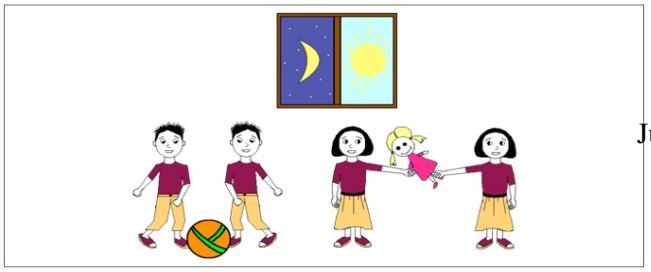
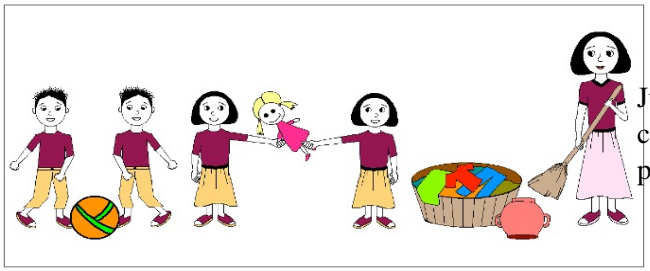
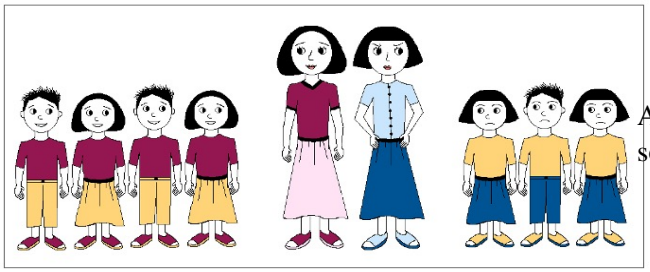
5		Anna has 3 kids.
6		Anna needs to buy at least 3 bananas.
7		Julia has 4 kids.
8		Julia needs to buy at least 4 bananas.

9		Anna needs to buy fewer bananas than Julia.
10		1 banana costs 1 coin.
11		Julia buys 4 bananas.
12		Anna buys 6 bananas.

13		Anna has to pay more coins than Julia.
14		Anna has to pay exactly 2 more coins than Julia.
15		Then Julia sees pots and knives.
16		Anna asks the seller: “How much are the knives?”

17		The seller says: “Small knives are 5 coins each. Big knives are 7 coins each.”
18		Julia asks the seller: “How much are the pots?”
19		The seller says: “Small pots are 4 coins each. Big pots are 9 coins each.”
20		Julia says: “Wow! Pots can be more expensive than knives! I didn’t know that.”

21		Anna buys a big pot. Julia buys a small pot. Julia needs to pay less than Anna. They pay and go home.
22		Anna gives many bananas to her kids. But her kids are unhappy, because Anna is very strict.
23		Anna makes her kids work day and night.
24		Anna lets her kids play so little! Because the kids can play so little, they are very sad.

25		Julia gives few bananas to her kids. But her kids are happy, because Julia is very nice. Julia's kids have to work less hard than Anna's kids.
26		Julia lets her kids play day and night.
27		Julia lets her kids work so little! Because they can work so little, the kids play all the time.
28		Anna and Julia are sisters, but they are so different!

A.3 Additional materials on attributive comparatives

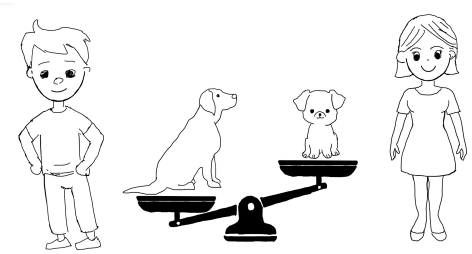
To test whether external readings are available for attributive comparatives, we used comparatives with and without *renda*:

(55) A John ra-a baaga n ya zɪsgo n yɪɪd a Mary
PM John buy-AFF dog N is heavy N exceed PM Mary
'John bought a heavier dog than Mary.' [target]

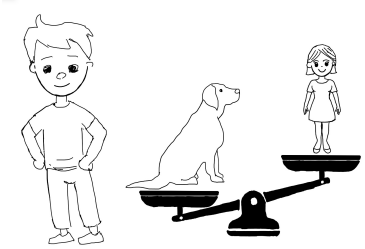
(56) A John raa baaga ya zɪsgo n yɪɪd a Mary rẽnda.
PM John buy-AFF dog is heavy N exceed PM Mary the.one.of
'John bought a heavier dog than the one of Mary's.' [control]

We paired them with pictures depicting a scenario that is compatible with either the external reading or the internal reading. For each sentence, the speaker only gets to see one of the two pictures.

(57) John bought a heavier dog than Mary.

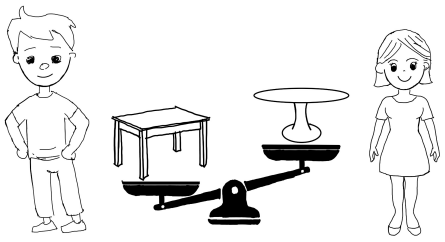


Picture A (external)

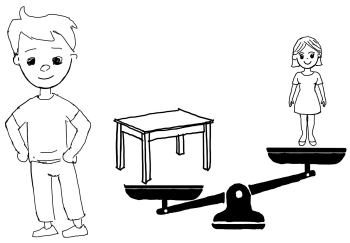


Picture B (internal)

(58) John built a heavier table than Mary.

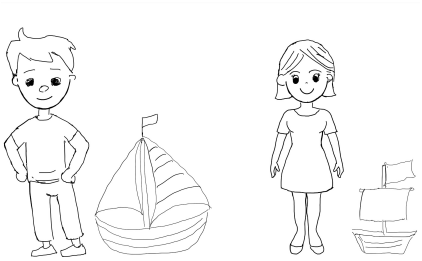


Picture A (external)

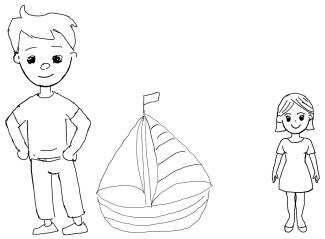


Picture B (internal)

(59) John built a bigger boat than Mary.

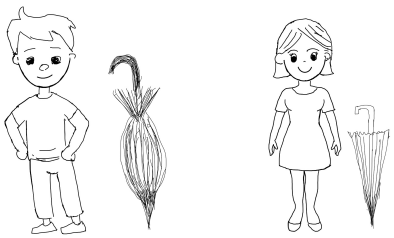


Picture A (external)

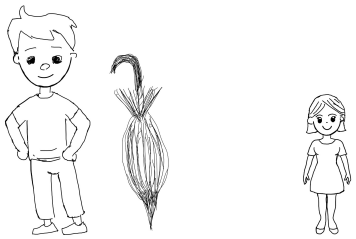


Picture B (internal)

(60) John bought a bigger umbrella than Mary.



Picture A (external)



Picture B (internal)