

# Not Everything Needs to Be Big or Small: Evidence from Children’s Interpretation of Vague Adjectives

Merle Weicker and Petra Schulz

## 1. Vagueness

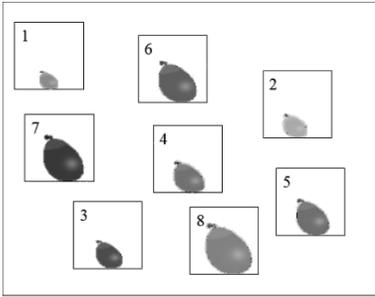
Adjectives such as *big* and *small* are vague predicates, which are characterized by (i) their context-dependent interpretation and (ii) the existence of ‘borderline cases’ (e.g., Kennedy, 2007). Vague adjectives are gradable, that is, they must be interpreted relative to a standard of comparison to evaluate whether the property introduced by the adjective holds of an individual. Crucially, for vague adjectives this standard is context-dependent. Consider Figure 1: water balloon 8 may be considered big in a context of other water balloons, but not for toys in general. This context-dependency is also mirrored by the relation between antonyms: the negation of one form (e.g., *The water balloon is not big*) does not entail the assertion of the other (e.g., *The water balloon is small*) (Kennedy, 2007; Solt, 2011). According to Kennedy (2007), this inference is not possible because the standards for *big* and *small* need not be the same due to their context dependency.

Let us turn to the second property of vague predicates, the existence of borderline cases. Borderline cases are entities for which it is difficult to judge whether a predicate like *is big* is true or false. In the context displayed in Figure 1, there is a set of objects that can be clearly judged as big (e.g., water balloons 6, 7, and 8) and a set of objects that can be clearly judged as not big (e.g., water balloons 1, 2, and 3). In addition, there may be objects that are more difficult to judge as big or not big (e.g., water balloons 4 and 5).

---

\* Merle Weicker, Goethe University Frankfurt, [weicker@em.uni-frankfurt.de](mailto:weicker@em.uni-frankfurt.de)  
Petra Schulz, Goethe University Frankfurt

This research was funded by the German Research Foundation (GRK 2016/1 “Nominal Modification”, Spokesperson: Caroline Féry, Deputy Spokesperson: Esther Rinke). We thank Ede Zimmermann for his semantic advice. We are grateful for valuable comments from the audiences at BUCLD 44, XPrag-ADJ19, Sinn und Bedeutung 24, and GALA 14. We thank Alexandra Lowles for drawing the stimuli and Valeria Bunkov, Silvana Pfuhez and Alexandra Lowles for helping with data collection. We also thank all participants who took part in this study.



**Figure 1. Example context for borderline cases.**

Theoretical accounts differ in how these borderline cases are described best (Fine, 1975; Égré & Zehr, 2018). Under the assumption of a positive and a negative extension of a given predicate, borderline cases have been argued to either pose a gap between the positive and negative extension or pose an overlap of the positive and negative extension – a so-called glut. A gap between the positive and the negative extension of for instance *is big* can be paraphrased as IS **NEITHER BIG NOR NOT BIG**, a glut can be paraphrased as IS **BOTH BIG AND NOT BIG** (Égré & Zehr, 2018).

Both, the context-dependent meaning and the existence of borderline cases result in the interpretive uncertainty of vague predicates. In what follows, we focus on how adults and children deal with interpretive uncertainty regarding borderline cases.

## **2. Previous findings on the interpretation of borderline cases**

### **2.1. Adult studies**

Adults' interpretation of borderline cases has been investigated with two different tasks: truth-value judgement (Alxatib & Pelletier, 2011; Égré & Zehr, 2018), and picture selection (Solt & Gotzner, 2010). Alxatib and Pelletier (2011) showed 76 English-speaking participants a group of five male figures (#1, #2, ..., #5) which differed in height. For each figure, the participants had to judge four statements, choosing between *true*, *false*, or *can't tell*. The statements were of the form *#1 is tall*, *#1 is not tall*, *#1 is tall and not tall*, and *#1 is neither tall nor not tall*. Regarding the interpretation of borderline cases, the conjunctive and the disjunctive statement are crucial. For both statements, the percentage of *true*-responses increased for figures with a height closer to the average, indicating a borderline case. Interestingly, participants accepted both the conjunctive and disjunctive statement as a description of the borderline case with a preference for the disjunctive statement.

Using written scenarios involving a verbal description of a borderline case (*versus* visual contexts as in Alxatib and Pelletier, 2011), Égré and Zehr (2018)

tested 148 English-speaking<sup>1</sup> adults. They had to answer questions of the form *Is it true to say the following...?* with *yes* or *no*. Parallel to Alxatib and Pelletier's study, the statements contained conjunctive or disjunctive descriptions of the borderline case. In line with the previous finding, Égré and Zehr found that adults accepted both the conjunctive and the disjunctive statement, but preferred the latter.

Solt and Gotzner (2010) studied the adult interpretation of adjectives and their negation (e.g., *tall* and *not tall*) as well as of adjectives and their lexical antonym (e.g., *tall* and *short*) in German. In their first experiment, participants saw a series of pictures (e.g., suitcases of different sizes) and were asked *Which pictures can be described by the sentence...?* The sentence contained either the adjective, its negation or its lexical antonym (e.g., *The suitcase is large/not large/small*). In the second experiment, the adjective and its negation were presented together with the same series of pictures. Participants' classifications of the pictures according to whether they satisfied the adjectives, their negation, and their lexical antonym across both experiments indicate that for most of the 37 participants some pictures were neither described by the adjective nor by its negation nor by its lexical antonym. This classification matches the disjunctive description of borderline cases (e.g., NEITHER LARGE NOR SMALL/NOT LARGE). A small number of participants, however, selected the same pictures for the adjective and its opposite. This latter response pattern exactly matches the conjunctive description (e.g., LARGE AND SMALL/NOT LARGE). For few participants no borderline cases existed, i.e., they exhaustively classified the pictures as EITHER LARGE OR SMALL/NOT LARGE.

In summary, for adults borderline cases clearly exist for vague predicates, and they are interpreted as 'gluts' (e.g., BIG AND SMALL) and as 'gaps' (e.g., NEITHER BIG NOR SMALL), with a preference for the latter.

## 2.2. Child studies

In contrast to adult studies, acquisition studies on vague predicates have mostly focused on the property of context dependency (Barner & Snedeker, 2008; Foppolo & Panzeri, 2013; Syrett, Bradley, Kennedy & Lidz, 2006; Tribushinina, 2013). To investigate whether children are aware that the interpretation of vague adjectives depends on the context, studies used picture-selection tasks or variants of the truth-value judgement task. The results so far suggest that starting at age 3 children are sensitive to the context dependency of vague adjectives. Note that although borderlines cases were not tested explicitly, these findings allow important first insights into the question of whether children in their interpretation of vague predicates consider the existence of borderline cases. The relevant results are summarized below.

---

<sup>1</sup> Note that, as in Alxatib and Pelletier's (2011) study, not all participants were monolingual English speakers.

Barner and Snedeker (2008) investigated how four-year-old English-speaking children interpret the lexical antonyms *tall* and *short*. The children saw a series of unknown objects that differed in height and had to determine which objects were tall and which short. The standard for tallness, measured as the average minimum height for objects selected as *tall*, differed significantly from the standard for shortness, measured as the average maximum height for objects selected as *short*. In our view, this finding suggests that four-year-olds are able to detect borderline cases. Importantly, the children interpreted these borderline cases as gaps: in their eyes, some objects are neither tall nor short.

Results for children younger than age 4 are inconclusive regarding the existence of borderline cases and their interpretation. Tribushinina (2013) asked Dutch-speaking children between the ages of 2 and 7 which objects they find big or small in a series of familiar objects that differed in size. Presented with a range of objects, the two- and three-year-old children attached BIG and SMALL only to the two extremes, i.e., the biggest or the smallest object, in more than 50% of the cases. This response pattern may indicate detection of borderline cases with a gap between big and small objects. However, compared to the older children's and adults' responses in this study, it is more likely that the youngest children have not yet acquired the target-like standard for big and small objects. The target-like standard is in fact located around the center of the object series, which is reflected in the older children's and adults' responses.

In contrast to Tribushinina (2013), studies with English- and Italian-speaking children (Foppolo & Panzeri, 2013; Syrett et al., 2006) found that three- to five-year-olds – just like adults – locate the boundary between big and not-big/small objects, for instance, around the center of the object series. Both studies used a Scalar Judgement Task: children saw a series of objects that displayed the same property but to different extents. For each object children were asked 'Is this ADJ?' (e.g., *Is this big?*). Syrett et al. (2006) tested positive adjectives only, whereas Foppolo and Panzeri (2013) included positive adjectives and their lexical antonyms. Findings from both studies show a shift between *yes*- and *no*-responses around the center of the object series. Do these response patterns tell us something about the existence of borderline cases? We think they do: they may indicate that objects are either in the positive or in the negative extension of the adjective. This in turn would suggest that for three-year-olds borderline cases do not exist. Note, however, that the analysis at group level leaves open whether there are objects that fall neither in the positive nor in the negative extension or that fall in both the positive and the negative extension.

In summary, children as young as age 3 have been found to be sensitive to the vagueness of adjectives, which is mirrored in their context-sensitive interpretations. Regarding children's awareness of borderline cases, the results are inconclusive. The different results for the three-year-old children could be due to the different tasks used or could reflect different strategies.

Combining the acquisition research into the context dependency of vague adjectives with the adult research addressing the interpretation of borderline cases, the present study aims at investigating how the interpretation of borderline

cases develops across age. A second aim addresses the issue of the preferred interpretation of borderline cases, which is still unresolved in both adults and children. Are the borderline cases preferably treated as a gap between the positive and the negative extension of an adjective or are there individual differences concerning the preference for gaps *versus* gluts?

### 3. Study on borderline cases

The present study investigates the sensitivity to borderline cases of vague predicates in monolingual German-speaking children and adults. We addressed three research questions:

- (Q1) Do adults and children detect borderline cases?
- (Q2) Do adults and children interpret borderline cases as gaps or as gluts?
- (Q3) Do children's interpretation patterns change with age?

#### 3.1. Participants

Forty-three monolingual German-speaking children took part in the experiment: 11 three-year-olds (5 girls, 6 boys, age range: 3;2 to 3;11 years, mean age: 3;7 years), 15 four-year-olds (7 girls, 8 boys, age range: 4;1 to 4;11 years, mean age: 4;6 years) and 17 five-year-olds (9 girls, 8 boys, age range: 5;0 to 5;9 years, mean age: 5;4 years). A standardized language test (SETK 3-5, Grimm, 2001) was administered to ensure that all children were typically-developing. The children came from the Frankfurt area and were all tested at their day-care centers. In addition, twenty-six adult native speakers of German (22 female, 4 male) were tested. The adults were undergraduate students of Goethe University Frankfurt with little or no background in linguistics. They received compensation for their participation.

#### 3.2. Method

##### 3.2.1. Materials

Like Barner and Snedeker (2008), Solt and Gotzner (2010) and Tribushinina (2013), we used the method of picture selection; the task was newly developed for this study (see Weicker, 2019, for details). Participants saw eight picture cards (14x14cm) simultaneously. Each picture card displayed a single object: a water balloon or a space hopper. These toys were chosen because they are likely to be familiar to children at the ages tested, they could conceivably come in different sizes, and they could easily be depicted. Every object had a different size and was of a different color. In contrast to most previous studies (Foppolo & Panzeri, 2013; Solt & Gotzner, 2010; Syrett et al., 2006; Tribushinina, 2013), objects were presented in random fashion (see Figure 2). This way, participants were invited to establish their own ordering and were prevented from making their judgement based on a given order.

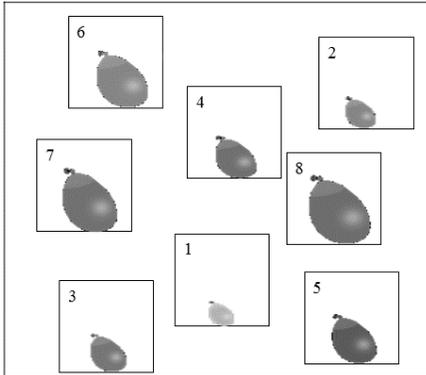


Figure 2a. Visual array for test prompts *Please give me the big/small water balloons.*

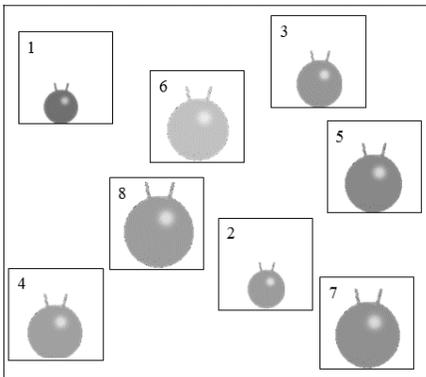


Figure 2b. Visual array for test prompts *Please give me the big/small space hoppers.*

### Figure 2. Test items.<sup>2</sup>

All test prompts had the form ‘Please give me the *ADJ<sub>plural</sub> N<sub>plural</sub>*’, e.g., *Gib mir bitte die großen Hüpfbälle* ‘Please give me the big space hoppers’. The test prompts were spoken with neutral, non-contrastive intonation. The nouns tested were *Wasserbomben* (‘water balloons’) and *Hüpfbälle* (‘space hoppers’) and the adjectives were *groß* (‘big’) and the lexical antonym *klein* (‘small’). There were two trials per adjective, i.e., a total of four test items per child.<sup>3</sup> We included the adjective’s lexical antonym rather than its negation (*nicht groß* ‘not big’, *nicht*

<sup>2</sup> The numbers on the picture cards were not present in the actual experiment. They are added here for easier reference to them in Section 3.2.3. (‘Data analysis’).

<sup>3</sup> The trials described here were part of a larger study. In total, the experiment comprised 24 test items and 20 filler items (see Wecker, 2019; Wecker & Schulz, 2018).

*klein* ‘not small’) for two reasons: first, in our test prompts the adjective occurs in prenominal position, which is marked for negated adjectives (e.g., \**Gib mir bitte die nicht großen/nicht kleinen Hüpfbälle* ‘Please give me the not big/not small space hoppers’). Second, using the lexical antonym avoids potential interference of non-adult-like interpretation of negation.

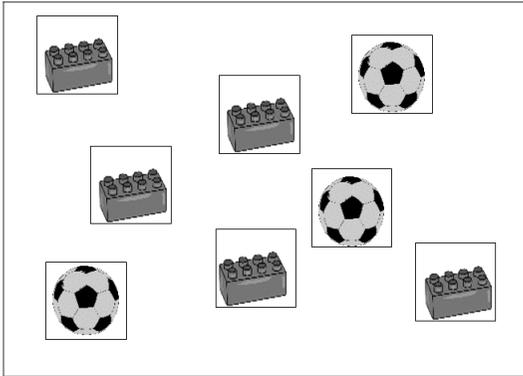
Importantly, the visual set up for *big* and *small* was identical (see Figure 2). This way, it was possible to see whether some objects in the visual array counted as borderline cases for the participants. Objects constitute borderline cases if they were neither selected when asked for *big water balloons/space hoppers* nor when asked for *small water balloons/space hoppers* or if specific objects were selected both when asked for *big water balloons/space hoppers* and when asked for *small water balloons/space hoppers*. In contrast, if participants selected each object exactly once across both trials, i.e., either when they were asked for *big water balloons/space hoppers* or when asked for *small water balloons/space hoppers*, no object constitutes a borderline case.

In addition to the test trials, a total of eight filler trials were included in the experiment. The filler trials served two purposes. First, the overall set up of the experiment was implemented as a game, in which a puppet, played by the experimenter, and the participant take turns in selecting picture cards (see Section 3.2.2. for the details of the procedure). The participant had to select picture cards in the test trials; and the puppet’s picture selections served as fillers. Second, inclusion of filler items in-between the test items in a pseudo-randomized order served to minimize possible influences from the prior test item. Like the test trials, each filler trial consisted of eight picture cards, but unlike the test trials, the picture cards in each filler trial displayed two different types of toys (bucket, dice, soccer ball, or Lego® brick). The respective objects from two different basic-level categories differed in shape (round or square) and color (blue or red) (see Figure 3). In the filler items the participants had to make the request, which was similar to the test prompts, but due to the objects displayed on the picture cards included different adjectives (shape or color), e.g., *Bitte gib mir die blauen Fußballle* ‘Please give me the blue soccer balls’.

In order to introduce the participants to the objects and their names, the experimenter presented single exemplars of the objects on a picture card and asked the participants to label them at the beginning of each session.

Before the test trials three practice trials were administered to familiarize participants with the task; they did not contain any adjectives (e.g., *Gib mir bitte die Puppen* ‘Please give me the dolls’). For one of the practice trials only one object fitted the description; this way children saw that selecting only one object was a licit choice. Children received feedback on the practice trails to emphasize this point. Recall that all requests in the test trials were of the same form and hence all contained a plural DP (e.g., *big water balloons*). Nevertheless, we wanted the participants to select as many or few objects as they liked. For instance, for some participants only the biggest object may match their interpretation of the request. If participants in the practice trials noticed that only one object matched the test prompt, the experimenter explained that the puppet’s

request was the same independent of the number of matching objects. If the participants forgot to pick one of the objects that matched the description (e.g., being a doll), the experimenter pointed this out to the participant.



**Figure 3. Example filler trial.**

### 3.2.2. Procedure

The experiment was administered in two sessions. The participants received the test trials containing the adjective *big* in the first session and the lexical antonym *small* in the second session. We used the same visual displays and order of presentation in both sessions, so we could compare the object choices for *big* and *small* directly. The two sessions were about twelve days apart to minimize influences from participants' choices in the first session to their choices in the second session. All participants were tested individually in a quiet room, the children at their day-care centers and the adults at university. The participants sat next to the experimenter on the floor or at a table large enough to display all picture cards at the same time.

At the beginning of each test session the experimenter introduced the participant to a hand puppet. She was told that the puppet wanted to play a game. The puppet and the participant each received a special dice that they had to roll without letting the other one see the outcome. This set-up was chosen to engage the children in a situation that naturally requires taking turns. The participants' dice showed four options: square, circle, blue color dot, red color dot. If it was the participant's turn, the experimenter distributed the eight picture cards on the table and the participant rolled her dice. When the dice showed 'blue', for example, she had to ask the puppet, played by the experimenter, to hand her the blue toys, etc. The participant's requests corresponded to the filler trials. If it was the puppet's turn, the experimenter distributed the picture cards on the table as well and the puppet rolled the dice and made its request to the participant. The puppet's requests corresponded to the test trials. The participant's task was to select those objects that in her opinion matched the test prompt.

### 3.2.3. Data analysis

For each participant and for each of the four test trials, we calculated the cut-off points for *big* and *small*, i.e., the smallest object selected as big and the biggest object selected as small. This analysis allowed us to classify participants' choices according to one of three response types: (i) no gap between the cut-off points, e.g., the cut-off point for *big* is 5 and the cut-off point for *small* is 4. This response indicates no existence of borderline cases; (ii) a gap between the cut-off points, e.g., the cut-off point for *big* is 6 and the cut-off point for *small* is 3. This response indicates existence of borderline cases (in this scenario objects 4 and 5) and their interpretation as NEITHER BIG NOR SMALL, which is referred to as 'gap'; (iii) an overlap between cut-off points, e.g., the cut-off point for *big* is 4 and the cut-off point for *small* is 5. This response indicates existence of borderline cases (in this scenario objects 4 and 5) and their interpretation as BIG AND SMALL, which is referred to as 'glut' (see Section 1).

### 3.3. Results

Regarding research question (Q1) whether participants detect borderline cases, the most important result was that some objects in the series constituted borderline cases for both adults and children across all age groups. Moreover, at the group level, the proportion of responses exhibiting borderline cases was higher than the proportion of responses without borderline cases. This difference was significant for the four-year-olds, five-year-olds and for the adults (see Table 1).

**Table 1. Percentage of responses with and without borderline cases, and significance according to Wilcoxon test. The missing value to 100% contains unanalyzable responses.**

Age	N	Borderline cases	No borderline cases	<i>p</i>
3	11	68.0	25.0	.102
4	15	83.5	14.5	.002**
5	17	70.5	28.0	.035*
Adults	26	88.5	11.5	< .001***

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$

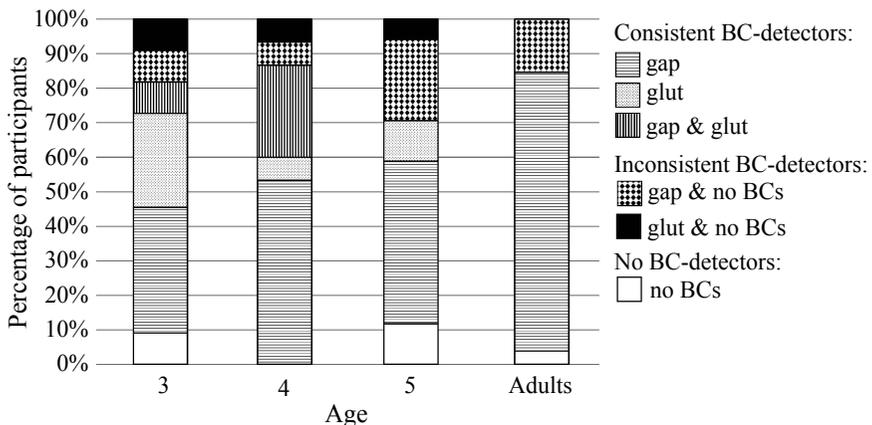
In a second step, we looked at the individual behavior and calculated the number of participants in each age group who detected borderline cases. Table 2 summarizes the results. Notably, for the majority of participants (94.2%), including the three-year-olds, borderline cases existed. More specifically, 75.4% of the participants judged specific objects as borderline cases across trials; we refer to them as 'consistent BC-detectors'. A further 18.8% of the participants judged specific objects as borderline cases in some trials only; we refer to them

as ‘inconsistent BC-detectors’. This data indicates that children as young as age 3 detect borderline cases and that only very few (5.8%) of the participants did not detect any borderline cases; we refer to them as ‘no BC-detectors’.

**Table 2. Number of ‘BC-detectors’ per age group.**

Age	Consistent BC-detectors	Inconsistent BC-detectors	No BC-detectors	N
3	8	2	1	11
4	13	2	0	15
5	10	5	2	17
Adults	21	4	1	26
<b>Total</b>	<b>52</b>	<b>13</b>	<b>4</b>	<b>69</b>

The next question we addressed was whether children and adults interpreted these borderline cases as gaps or as gluts (Q2). Figure 4 illustrates the results.



**Figure 4. Distribution of borderline case interpretations per age group.**

The majority of the 52 consistent BC-detectors (78.8%) exhibited a gap-interpretation of borderline cases, i.e., for them specific objects in the series were NEITHER BIG NOR SMALL. In contrast, only 11.5% of the consistent BC-detectors showed a glut interpretation of borderline cases, i.e., for them specific objects in the series were BOTH BIG AND SMALL. 9.7% of the consistent BC-detectors showed a mixed pattern, i.e., borderline cases were interpreted as gaps or as gluts, depending on the trial. The 13 inconsistent BC-detectors exhibited gap- as well as glut-interpretations. The raw number of participants per interpretation pattern for each age group is given in the Appendix.

In summary, participants opted for both gap (NEITHER BIG NOR SMALL) and glut (BIG AND SMALL) interpretations for borderline cases, but gap interpretations were clearly preferred. To examine whether this interpretation behavior changes with

age (Q3), we calculated the correlation between interpretation (gap or glut) and age (3, 4, 5, adult) in the group of 47 BC-detectors with a consistent gap- or glut-interpretation. There was a significant relationship between interpretation and age ( $X^2(3, N = 47) = 9.26, p = .019$ ; Fisher's Exact Test:  $p = .012$ ; Cramer's  $V = .444, p = .019$ ). That is, the number of participants with a gap-interpretation compared to the number of participants with a glut-interpretation increased with age.

#### 4. Discussion

As for (Q1), the findings of the present study reveal that, like the adults, most preschool children are able to detect borderline cases: they judged specific objects in a series as neither clearly big nor clearly small. Addressing (Q2), the statistical analyses showed that participants interpreted these borderline cases as NEITHER BIG NOR SMALL ('gap') or as BIG AND SMALL ('glut'), but clearly preferred the gap-interpretation. As for (Q3), participants' preference for gaps significantly increased with age.

Notably, while all adults consistently treated borderline cases as NEITHER BIG NOR SMALL ('gap'), 11 out of the subgroup of 31 consistent child BC-detectors treated borderline cases as BIG AND SMALL ('glut'). Why do these children choose a glut-interpretation of borderline cases, which allows objects to fall in the extension of *big* and *small*? We suggest that children's apparent glut-responses do not reflect true borderline cases, but constitute an intermediate step towards the adult-like interpretation of vague adjectives. The reasoning is as follows: vague adjectives receive a context-dependent interpretation and hence the standard of comparison for vague adjectives such as *big* and *small* need not be the same (see Section 1). The standard for *big* is typically higher than the standard for *small* (Kennedy, 2007; Solt, 2011). What we know from previous acquisition studies (see Section 2.2.) is that by age 3 children are sensitive to the context dependency of vague adjectives. That is, children are aware that the standards for bigness and smallness can differ. Children may not know, however, the typical relations of the standards for bigness and smallness. More specifically, a child may allow the standard for bigness to be below the standard for smallness. In this case, an overlap emerges of the extensions of the adjective and its lexical antonym, i.e., the same specific objects are judged BIG AND SMALL. This response resembles a glut-interpretation of borderline cases, but is derived via the different standards for bigness and smallness. A 'real' glut-interpretation, in contrast, exploits the notion that a listener cannot decide whether an object is BIG OR SMALL and therefore interprets it as BIG AND SMALL.

#### 5. Conclusion

Besides their context-dependent interpretation, vague predicates such as *big* have been argued to be characterized by the existence of borderline cases (e.g., Kennedy, 2007). Two descriptions of these borderline cases have been suggested (Fine, 1975; Égré & Zehr, 2018): They have been characterized as gaps, e.g., as

NEITHER BIG NOR SMALL (or NEITHER BIG NOR NOT BIG). Alternatively, they have been characterized as gluts, e.g., as BIG AND SMALL (or BIG AND NOT BIG). Previous empirical studies with adults suggest that they accept both descriptions, but prefer the former. Acquisition studies have focused on the property of context dependency and have found that by age 3 children are sensitive to the context-dependent interpretation of vague adjectives.

Our results from a picture-selection task in German with 43 three- to five-year-old children and 26 adults indicate that children, like adults, interpret certain objects in a series as borderline cases. Adding to the acquisition research on context dependency, our finding provides further evidence that children as young as age 3 are sensitive to the vagueness of adjectives. The individual data revealed that all adults consistently treated borderline cases as NEITHER BIG NOR SMALL, which supports the semantic description of borderline cases as a gap between the positive and the negative extension of a predicate. Children's responses show that starting at age 3 most of the children show a gap-interpretation at least in some trials. However, for some of the children apparent borderline cases were interpreted as an overlap between the positive and negative extension of a predicate. We suggest that the overlap does not result from the detection of proper borderline cases, but from non-adult knowledge regarding the relation of the standard for bigness and the standard for smallness.

The current study used a picture-selection task, which was embedded in a game situation. The presentation of the pictures and the objects depicted were selected carefully: participants had to make their judgements on objects they were familiar with, the objects could conceivably come in different sizes, and participants had to establish their own ordering of the objects presented. This way we were able to infer participants' interpretation of borderline cases from their object choices in a natural setting without making the existence of borderline cases explicit. To probe the robustness of our findings, however, future studies could include truth-value judgements that require explicit choices on the part of the participants (see Alxatib and Pelletier, 2011; Égré and Zehr, 2018, for adult studies). These truth-value judgements assess whether participants accept or reject borderline case descriptions for specific objects, e.g., *This water balloon is big and small* or *This water balloon is neither big nor small* as descriptions of water balloon 4 in Figure 2a. Furthermore, the current study focused on vague adjectives and their lexical antonyms (*big/small*) to avoid interferences from children's interpretation of negation. Future studies could also include the negated forms of vague adjectives (e.g., *big/not big*) to learn more about the relation between the negation of an adjective and its lexical antonym.

In short, our study provides first evidence that for children, just like for adults, entities exist that need not be in either the positive or the negative extension of a predicate. Given the previous findings from acquisition, we can hence conclude that already by age 3 children are able to cope with the interpretive uncertainty of vague adjectives such as *big* and *small*, with respect to their context dependency and with respect to the existence of borderline cases. The study of vague adjectives fits well into a recent line of research aiming at

understanding how children acquire expressions with an uncertain meaning in general (see Tieu, Bill, Zehr, Romoli and Schwarz, 2018, for a comparison of presupposition, implicature, homogeneity, and vagueness).

## Appendix

**Table 3. Raw number of participants per interpretation pattern and age group.**

Age	Consistent BC-detectors		Inconsistent BC-detectors		No BC-detectors
	gap	glut	gap & glut	gap & no BCs	
3	4	3	1	1	1
4	8	1	4	1	0
5	8	2	0	4	2
Adults	21	0	0	4	1
<b>Total</b>	<b>41</b>	<b>6</b>	<b>5</b>	<b>10</b>	<b>4</b>

## References

- Alxatib, Sam & Pelletier, Francis Jeffrey (2011). The Psychology of Vagueness: Borderline Cases and Contradictions. *Mind & Language*, 26(3), 287–326.
- Barner, David & Snedeker, Jesse (2008). Compositionality and Statistics in Adjective Acquisition: 4-Year-Olds Interpret ‘Tall’ and ‘Short’ Based on the Size Distributions of Novel Noun Referents. *Child Development*, 79(3), 594–608.
- Égré, Paul & Zehr, Jérémy (2018). Are Gaps Preferred to Gluts? A Closer Look at Borderline Contradictions. In E. Castroviejo, L. McNally & G. Weidman Sassoon (Eds.), *The Semantics of Gradability, Vagueness, and Scale Structure* (pp. 25–58). Berlin: Springer.
- Fine, Kit (1975). Vagueness, truth and logic. *Synthese*, 30, 265–300.
- Foppolo, Francesca & Panzeri, Francesca (2013). Do children know when their room counts as clean? In S. Kan, C. Moore Cantwell & R. Staubs (Eds.), *NELS 40: Proceedings of the 40th Annual Meeting of the North East Linguistic Society: Volume One* (p. 205–218). Amherst, MA: GLSA.
- Grimm, Hannelore (2001). *SETK 3-5. Sprachentwicklungstest für 3- bis 5-jährige Kinder*. Göttingen: Hogrefe.
- Kennedy, Christopher (2007). Vagueness and grammar: the semantics of relative and absolute gradable adjectives. *Linguistics and Philosophy*, 30, 1–45.
- Solt, Stephanie (2011). Notes on the comparison class. In R. Nouwen, R. van Rooij, U. Sauerland & H.-C. Schmitz (Eds.), *ViC 2009 (Papers from the ESSLLI 2009 Workshop on Vagueness in Communication)* (pp. 189–206). Berlin: Springer.
- Solt, Stephanie & Gotzner, Nicole (2010). *Expensive, not expensive or cheap? An experimental investigation of vague predicates*. Paper presented at the 11th Szklarska Poreba Workshop on Experimental Pragmasemantics, Szklarska Poreba.
- Syrett, Kristen, Bradley, Evan, Kennedy, Christopher & Lidz, Jeffrey (2006). Shifting Standards: Children’s Understanding of Gradable Adjectives. In K. Ud Deen, J.

- Nomura, B. Schulz, & B. D. Schwartz (Eds.), *Proceedings of the Inaugural Conference on Generative Approaches to Language Acquisition – North America, Honolulu, HI, Volume 2* (pp. 353-364). Cambridge, MA: UConn Occasional Papers in Linguistics 4.
- Tieu, Lyn, Bill, Cory, Zehr, Jérémy, Romoli, Jacopo & Schwarz, Florian (2018). Developmental insights into gappy phenomena: Comparing presupposition, implicature, homogeneity, and vagueness. In K. Syrett & S. Arunachalam (Eds.), *Semantics in Language Acquisition* (pp. 302-324). Amsterdam: John Benjamins.
- Tribushinina, Elena (2013). Adjective Semantics, World Knowledge and Visual Context: Comprehension of Size Terms by 2- to 7-Year-Old Dutch-Speaking Children. *Journal of Psycholinguistic Research*, 42, 205-225.
- Weicker, Merle (2019). *The role of semantic complexity for the acquisition of adjectives* (Doctoral dissertation, Goethe University Frankfurt, Germany). Retrieved from <http://publikationen.uni-frankfurt.de/frontdoor/index/index/docId/50979>.
- Weicker, Merle & Schulz, Petra (2018). Is ‘clean’ the Same as ‘not dirty’? On the Understanding of Absolute Gradable Adjectives. In A. B. Bertolini & M. J. Kaplan (Eds.), *Proceedings of the 42th Annual Boston University Conference on Language Development* (pp. 790-802). Somerville, MA: Cascadilla Press.

# Proceedings of the 44th annual Boston University Conference on Language Development

edited by Megan M. Brown  
and Alexandra Kohut

Cascadilla Press    Somerville, MA    2020

## **Copyright information**

Proceedings of the 44th annual Boston University Conference on Language Development  
© 2020 Cascadilla Press. All rights reserved

Copyright notices are located at the bottom of the first page of each paper.  
Reprints for course packs can be authorized by Cascadilla Press.

ISSN 1080-692X  
ISBN 978-1-57473-057-9 (2 volume set, paperback)

## **Ordering information**

To order a copy of the proceedings or to place a standing order, contact:

Cascadilla Press, P.O. Box 440355, Somerville, MA 02144, USA  
phone: 1-617-776-2370, [sales@cascadilla.com](mailto:sales@cascadilla.com), [www.cascadilla.com](http://www.cascadilla.com)