A Crosslinguistic Study of Symmetrical Judgments

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1. Introduction

A longstanding puzzle in developmental linguistics is why children are more permissive than adults in assigning distributive interpretations to sentences with the universal quantifiers *each*, *every*, and *all* under certain experimental conditions. One well-known controversial issue in this area is children's symmetrical judgments of universally quantified sentences. Symmetrical judgments are elicited when a child is asked to judge if a sentence including a universal quantifier describes a visual context depicting an incomplete distributive relation. The following three judgment types have been included in the set of symmetrical judgment types in the literature (examples from Kang, 2001).

(1) Exhaustive Pairing (EP) judgment.
The sentence *All the bears are holding a honeypot* is rejected as a description of a visual context depicting three bears each holding a different honeypot if an unpaired honeypot is also present in the picture on the grounds that there is no bear for the unpaired honeypot (EP judgment task).

(2) Exhaustive (EXH) judgment.
The sentence *All the bears are holding a honeypot* is rejected as a description of a visual context depicting three bears and a piglet each holding a different honeypot on the grounds that the piglet is holding a honeypot (EXH judgment task).

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(3) Underexhaustive Pairing (UP) judgment.
The sentence *All the bears are holding a honeypot* is accepted as a description of a visual context depicting three of four bears each holding a different honeypot (UP judgment task).

Decades of research have shown that contextual, pragmatic, and grammatical variation all affect children's performance with universal statements on symmetrical judgment tasks (Drozd, 2001). However, the vast majority of empirical and theoretical research on symmetrical judgments has so far focused on particular individual languages.

In this paper, we present some initial results of a large scale experiment designed to explore symmetrical judgments from a cross-linguistic perspective. Our experiment was conducted with 4-6-year-old children and adults using the same methodology in 12 languages: Catalan (Romance), Cypriot Greek (Greek), Danish, Dutch, and German (Germanic), Croatian, Polish, Russian, Serbian and Slovak (Slavic), Lithuanian (Baltic), and Maltese (Semitic). Our results show that although children's performance with universal statements is remarkably uniform

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across languages, there is evidence that children find distributive universal quantification in some languages more difficult than in others.

2. Crosslinguistic variation in symmetrical judgments

A crosslinguistic survey of experimental research on symmetrical judgments reveals considerable crosslinguistic differences in the frequencies, robustness, and developmental trajectories of symmetrical judgments. EP judgments, the most robust and most often reported symmetrical judgment type, have been elicited at different rates across languages. Escobar et al (2007) reported a relatively low EP judgment rate for Spanish 4-6 year-olds (22%) similar to EP judgment rates reported for German 3-6 year olds (20%, Brinkmann, Drozd and Krämer, 1996) and Hungarian 5-year-olds (27%, Kiss and Zétényi, 2017). Slightly higher EP judgment rates have been reported for Catalan 5-7-year-olds (41%, Gavarró and Escobar, 2011) and Russian 5-6-year-olds (43%, Sekerina, 2015) and still higher rates for English 3-5-year-olds (e.g., 59%, Aravind et al, 2017; 57%, Philip, 1995), Korean 4-7-year-olds (65%, Kang, 2001) and Japanese 4-5-year-olds (75%, Philip, 1995; 83%, Minai et al, 2012). UP and EXH judgments have been reported less often in the literature and have been elicited in fewer languages, including Catalan (Gavarró & Escobar, 2011), Dutch (Philip, 2011), English (e.g., Aravind et al, 2017; Philip, 1995) and Japanese (Philip, 1995). Overall, these reports suggest that EXH and UP judgments are less robust than EP judgments. Gavarró and Escobar (2011) reported that 5-7-year-old Catalan children produced EXH judgments 12% and UP judgments 6% of the time. Philip (1995:163-4,169) reported that 3-5-year-old English-speaking children produced EXH judgments 46% of the time and UP judgments less than 3% of the time. However, Aravind et al (2017) more recently reported much higher UP judgment rates for 4-6-year-old English speakers (app. 61%).

There is also growing evidence that different symmetrical judgments types have different developmental trajectories. EP judgment rates have been reported to increase and EXH and UP judgment rates to decrease with age. Gavarró and Escobar (2011) elicited EP judgments 28% of the time from Catalan 3-4-year-olds but 41% of the time from 5-6-year-olds. Aravind et al (2017) reported eliciting EP judgments from 140 English-speaking 4-year-olds 18% of the time but 72% of the time when these same children were 6-year-olds. In contrast, EXH judgments decline sharply after the age of 5 (Philip, 1995). Gavarró and Escobar (2011) reported eliciting EXH judgments from 3-4-year-old and 5-7-year-old Catalan children 44% and 12% of the time, respectively. UP judgments also decline sharply after the age of 5. Gavarró and Escobar (2011) reported that 3-4-year old Catalan children produced UP judgments 44% of the time and 5-7-year olds only 6% of the time. Aravind et al (2017) reported eliciting UP judgments from 4-year-old English-speaking children 60% of the time and from 5-6-year-olds only 16% of the time.

What accounts for this variation?

3. Theoretical accounts of symmetrical judgments

We assume that the reported crosslinguistic variation in children's symmetrical judgment performance reflects the combined effects of potentially many factors including methodological, cognitive, pragmatic, and grammatical factors. Theoretical accounts of symmetrical judgments have focused on the roles of pragmatic and linguistic factors to explain symmetrical judgments.

Symmetrical judgments involve the distributive interpretations of sentences with the universal quantifiers *each, every,* and *all.* Our experiment elicited symmetrical judgments with sentences with *all*. Henceforth, for convenience we use the term 'universal quantifier' to refer only to *each, every* or *all,* '*all*NP' to refer to simple universally quantified NPs like *all the horses*, and *'all*NP sentence' to refer to sentences with *all*NP subjects like *All the horses are eating an apple.*

We assume that distributive universal quantification interpretations of *all*NP sentences involve a distributive operator ^{D} or *Dist* or a partition operator *Part* attached to VP (e.g., Brisson, 2003, Champollion, 2015; Lasersohn, 1999; Link, 1983; Schwarzschild, 1996, and many others). Distributive operators introduce universal quantification into semantic representations, which is represented by tripartite semantic structures of the form [$_S$ quantifier, domain, nuclear scope], as in (5). The domain in (5) includes two conditions which restrict the domain over which the nuclear scope is evaluated. The condition 'x is in the set of all the horses' represents a grammatical restriction restricting the domain to an exhaustive set of horses in the denotation of the *all*NP. The condition '*x* is in Cov_i' restricts the domain to an indexed 'cover', the function of which is to pragmatically restrict the domain further to a particular set of discourse referents whose relevance to sentence interpretation is determined by pragmatic principles (e.g., Brisson 2003; Schwarzschild, 1996).

(4) [$_S$ [$_{DP}$ All the horses] [Dist$_i$ [$_{VP}$ are eating an apple]]
(5) 'For each x, x is in the set of all the horses and *x* is in Cov_i, x is eating an apple.

Theoretical accounts of symmetrical judgments can be divided into Full Grammatical Competence accounts and Partial Grammatical Competence accounts (e.g., Aravind et al, 2017). Full Grammatical Competence accounts argue that children who produce EP judgments understand universal quantification like adults but make EP judgments due to methodological, processing, or cognitive factors. Kiss & Zétényi (2017) proposed that presenting test sentences for evaluation with respect to iconic visual contexts which lack accidental details, as is done on EP judgment tasks, has the pragmatic effect of rendering all of the entities presented as ostensively relevant. This ostensive effect leads to unmet assumptions that unpaired entities in visual context should be mentioned in the test sentences presented for evaluation, leading to EP judgments. Aravind et al (2017) proposed that universal statements presented in EP judgment tasks are under-informative and infelicitous because they do not mention unpaired

entities which are contextually salient in visual context. Although both children and adults are sensitive to the infelicity, children lack the pragmatic sophistication necessary to consider alternative topics of inquiry involving subsets of contextually salient entities (see also Minai et al, 2012 for a cognitive control account). Other Full Grammatical Competence accounts claim that the visual contexts presented on EP judgment tasks induce atypical strategies for pragmatically restricting quantificational domains (Philip 2011; Rakhlin, 2007). Philip (2011) claimed that adults and children presented with EP judgment tasks are prone to use different strategies for pragmatically restricting quantificational domains. Adults expect that contextually relevant entities are part of normal situations (the Normal World Constraint) and appeal to this pragmatic principle to pragmatically restrict quantificational domains to entities in visual context. Children do not appeal to world knowledge but instead expect contextually relevant entities to be salient (the Salient Object Strategy). Children conclude on this basis that a contextually relevant individual from the quantificational domain (e.g., a bear not present in visual context in (1)) is missing from visual context and reject the test sentence on this basis. Rakhlin (2007) claimed that EP judgment tasks present two strategies for pragmatically restricting the domain of the indefinite NP objects in universal statements. One strategy is to restrict the domain to the paired entities in visual context (e.g., the set of honeypots held by a bear in (1)). The other is to restrict the domain to the single exceptional entity in visual context (e.g., the honeypot not held by a bear in (1)), inducing a specific indefinite interpretation (Schwarzschild, 2002) of the indefinite NP. Children who find the unpaired entity contextually relevant assign a collective interpretation to the test sentence (e.g., *All the bears are holding a honeypot* > 'All the bears are holding a specific honeypot (= the one not held)'), and reject the test sentence on this basis.

Partial Grammatical Competence accounts assume that children lack the grammatical knowledge of universal quantification necessary to succeed on symmetrical judgment tasks. A common theme running through these accounts is that children who produce symmetrical judgments analyze universal quantifiers syntactically or semantically not as determiners but as sentence-level quantificational operators whose domains are grammatically restricted by multiple NPs in a sentence. One account which appeals to crosslinguistic differences was proposed by Kang (2001). Under a classical Quantifier Raising analysis of (6) given in (7), the DPs *Every bear* and *a honeypot* are raised to CP where they receive the quantificational interpretations necessary to derive distributive universal quantification. In (7), *every* is analyzed as a determiner which selects the NP complement in its scope to restrict its domain. Kang proposed that English and Korean children who make EP judgments analyze universal quantifiers not as determiners but as modifiers adjoined to NP (e.g., $[_{NP}$ $[_{ModP}$ every$][_{NP}$ bear]]. Under Kang's proposal, semantic representations underlying EP judgments are derived by semantically detaching *every* from NP and raising it to sentence-level FocusP position, where it is analyzed as a focused sentential operator which recruits both NPs in its scope to restrict its domain, as

depicted in (8). Kang (2001:610-611) proposed that the derivation in (8) is analogous to left branch sub-extraction in Polish (also Hungarian and Russian), which moves adjectival WH phrases out of NP to sentence-level focus positions, as in (9)(with added grammatical description).

(6) Every bear is holding a honeypot

(7) $[_{CP}\ [_{DP}$ Every bear$]_i\ [_{DP}$ a honeypot$]_j \ldots\ [_{IP}\ t_i$ is holding $t_j\ ]]$
'For every x, x a bear, there is a honeypot y and x is holding y'

(8) $[_{FocP}$ Every$_e \ldots [_{NP}$ e $[_{NP}$ bear$]]$, $[_{I'}\ [_{NP}$ a honeypot$]$, x is holding$_e$ y$]]$
'All minimal events in which either a bear or a honeypot is a participant are events in which a bear is holding a honeypot'

(9) $[_{FocP}$ Jakie $\ldots [_{IP}$ pożyczyłeś $[_{NP}$ ___ książki] z biblioteki?
which-ACC you-borrow books-ACC from library
'Which books did you borrow from the library?'
(Corver, 2017)

The Acquisition Path model developed by Roeper et al (2006, see also Roeper et al, 2011), which draws on Kang's account, proposed that the acquisition trajectory of the determiner *every* covers three stages. At the first stage, children initially analyze *every* as a sentence-level adverbial quantifier over events (e.g., *Every girl is riding a horse* > 'All events are events in which a girl is riding a horse'), an analysis that underlies both EP and EXH judgments. At a second stage, children learn that *every* is restricted to domains of individuals rather than events, predicting the disappearance of EXH judgments, but still allowing multiple NPs to restrict the domain of universal quantification (e.g., 'every girl is riding a horse and every horse is being ridden by a girl'). At the final third stage, children learn that *every* is a distributive determiner whose domain is restricted to the denotation of its NP complement ('every girl is a girl who is riding a horse'), predicting the disappearance of EP judgments. Other Partial Grammatical Competence accounts propose that grammatical processes of domain restriction associated with proportional weak quantifiers (*two, many*) are employed to restrict domains for universal quantifiers (Drozd, 2001; Geurts, 2003). Geurts proposed that proportional construals of weak quantifiers in sentences like (10) are derived by first building the bipartite semantic representation in (11), yielding the interpretation 'there are two cats holding a balloon'. In a second step, the form in (11) is transformed into a tripartite quantificational structure, as in (12), leaving the restriction unspecified. In a final step, the NP *two cats* is recruited as a grammatical restriction on the quantificational domain (13), yielding the proportional interpretation 'Two of the cats are holding a balloon'. Geurts argued that EP and UP judgments of sentences like (14) are derived in a similar way by transforming the bipartite structure (15) into an underspecified tripartite structure (16). At this point in the derivation, children select the NP for domain restriction whose denotation is salient and backgrounded in the discourse model. If the

denotation of the subject NP is salient, it is construed as a restriction on the domain, yielding (17). If the object NP is, it is recruited as the restriction, as in (18). Geurts tentatively proposed that EXH judgments are derived when the quantificational domain is restricted by neither grammatical nor pragmatic extralinguistic information, as in (19).

(10) Two cats are holding a balloon.

(11) [$_S$ [two] [x,y: x is a cat & there is balloon y & x is holding]

(12) [$_S$ [....] [two] [x,y: x is a cat & there is balloon y & x is holding y]]

(13) [$_S$ [x: x is a cat] [two] [y: there is balloon y & x is holding y]]

(14) Every cat is holding a balloon.

(15) [$_S$ [every] [x,y: x is a cat & there is balloon y & x is holding y]]

(16) [$_S$ [....] [every] [x,y: x is a cat & there is balloon y & x is holding y]]

(17) [$_S$ [x: x is a cat] [every] [y: there is a balloon y & x is holding y]]

(18) [$_S$ [y: y is a balloon] [every] [x: there is a cat x & x is holding y]]

(19) [$_S$ [x: x is an animal] [every] [y: there is a cat x & there is a balloon y & x is holding y]]

What links Kang's and Roeper and colleagues' sentential operator accounts and Geurts' weak quantifier account is the proposal that children who produce symmetrical judgments do not analyze universal quantifiers as determiners, and, as a consequence, allow NPs other than the NP the quantifier combines with in NP as grammatical restrictions on quantificational domains.

From a cross-linguistic perspective, the Full Grammatical Competence and Partial Grammatical Competence accounts offer different explanations for the cross-linguistic variation in symmetrical judgment rates we summarized above and also different hypotheses about symmetrical judgment rates we can expect to elicit in our experiment. Full Competence accounts contend that children who make EP judgments have the grammatical knowledge necessary to assign distributive interpretations to universal statements like adults and claim that EP judgments reflect different strategies for pragmatically restricting quantificational domains. Thus, under these accounts, we would expect crosslinguistic variation in EP judgment rates to reflect to some degree differences in the perceived salience or (ostensive) relevance of unpaired entities depicted in visual contexts or the extent to which these differences induce atypical strategies for pragmatically restricting quantificational domains. If the same methodology is used to elicit EP judgments across languages, these accounts would predict uniform EP judgment rates across languages.

Partial Grammatical Competence accounts, in our view, make two claims. The first claim is that symmetrical judgments arise when universal quantifiers are analyzed as nominal modifiers and/or sentential quantificational operators rather than as determiners. The second claim is that children who make symmetrical judgments construe the denotations of NPs other than or in addition to the NP in the scope of a quantificational determiner as grammatical restrictions on quantificational domains. From a cross-linguistic point of view, the first claim implies that children learning languages with transparent or salient linguistic cues that quantifiers are determiners should produce symmetrical judgments relatively less often than languages with fewer or less transparent linguistic cues. Following Kang's account, the first claim also implies that children acquiring languages in which universal quantifiers occur as quantificational adjectives (in our sample, Croatian, Polish, Russian, Serbian and Slovak, Lithuanian, and Maltese) should produce EP judgments relatively more often than children acquiring languages with quantificational determiners (Catalan, Danish, Dutch, German, and Cypriot Greek). The second claim implies that children will be less likely to make symmetrical judgments if the target language provides linguistic cues that the universal quantifier is related to the NP that supplies the grammatical restriction on its domain than if the target language does not. We adopt the widely-held view that languages exhibit grammatical cues that facilitate the acquisition of form-meaning mappings (e.g., Slobin 1985) and that children should be able to exploit them during the acquisition process when they are available (Bavin 1995). We adopt as a working hypothesis the view that NP concord systems (gender, case, number) provide linguistic cues that a noun and other words in NP are semantically related. As an example, we assume that the gender, case, and number concordances between the Serbian quantificational adjective *svi* ('all') and noun *konji* ('horse') in (20) are potential linguistic cues that these two words are semantically related in NP.

(20) Svi konji jedu
All.MASC.NOM.PL horse.MASC.NOM.PL eat.PRES.3PL
jabuku
apple.FEM.ACC
'All the horses are eating an apple'

Given these assumptions, we would expect that the experiments summarized in our survey which elicited EP judgments relatively less often were conducted in languages with relatively more linguistic cues that the quantifier is related to its NP restriction than experiments conducted in languages which supplied fewer linguistic cues.

4. Symmetrical judgment experiment

We designed our experiment to elicit EP, EXH, and UP judgments from 5-year-old children and adults in 12 languages using the same experimental

methodology. The experiment allowed us to establish a cross-linguistic baseline for the three symmetrical judgment types and to directly compare the symmetrical judgment performance of children and adults across languages and language families. The experiment and results we summarize here give us an initial picture of how robust and uniform symmetrical judgments are across European languages and allowed us to assess predictions of the Full Grammatical Competence and Partial Grammatical Competence accounts we reviewed above.

4.1. Participants

Participants included 291 monolingual children (Age Range 4;2 - 5;11; Mean Age = 5;2) and 277 adults evenly spread across 12 languages.

4.2. Task and Procedure

Each individual participant was presented with a truth-value judgment task (Crain and McKee, 1985) in a quiet area by a native speaker. Before the main experiment, each child was brought to a quiet area away at school and seated next to an experimenter in front of a laptop computer. As an introduction, the experimenter told the child that there are a lot of pictures in the computer but she is not sure she has set up the computer the right way and needs the child's help to find out. The child is then told that she is to be shown some pictures, that when she sees a picture she will also hear something, and that her job is to tell the experimenter if what she hears matches the picture or not. The child is presented first with three warm-up trials. On each warm up trial, the child is first shown a picture. Then the experimenter says *Let's hear what the computer says* and instructs the child to press the (space) button on the computer keyboard that activates a recorded sentence describing the picture. The child's response is recorded by the experimenter or a second experimenter on a score sheet. The instruction to activate the recorded sentence is repeated as often as necessary during the warm-up phase to establish the procedure.

4.3. Materials

We created 37 sentence-picture pairs for 18 symmetrical judgment trials, 8 control trials, 8 filler trials and 3 warm-up trials. 18 transitive sentences with *all*NP subjects and singular indefinite objects (e.g., *All the horses are eating an apple*) were paired with hand-drawn pictures to create the symmetrical judgment trials. Pilot testing revealed that *all* rather than *each* was the most natural and felicitous universal quantifier for this task in the 12 languages. 6 different *all*NP-sentences were paired with Extra Object (EO) pictures to create 6 EP judgment trials. Another 6 *all*NP- sentences were paired with Extra Actor (EA) pictures to create 6 UP judgment trials, and another 6 with Extra Actor and Object (EAO) pictures to create 6 EXH judgment trials. 8 control trials (4 true, 4 false) with numerical subjects (e.g., *Three women are opening a door*) were created to check for participants' competence with distributive quantification. Another 8

sentences with singular definite descriptions as subjects (e.g., *The man is washing a car*) were paired with 8 pictures of four independent scenes (e.g., a dog tugging on a blanket, a man washing a car, a girl building a sandcastle, a boy riding a scooter), to create 8 filler trials (4 true, 4 false). The positions of the extra objects, extra actors, and extra actor-object pairs in the EO, EA, and EAO pictures, the positions of the extra actors in the falsifying control pictures, and the positions of the verifying and falsifying scenes in the filler contexts were counterbalanced to prevent the anticipation of the location of verifying or falsifying visual information. All of the sentences used in the experiment included one of 7 transitive verbs known to be familiar to 5-year-old children and culturally appropriate for each of the 12 languages in our sample (*eat*, *open*, *kick*, *pull*, *paint*, *push*, *wash*, *carry*, *drive*, and *tickle*).

4.4. Initial Results and Discussion

All of the participants performed at ceiling levels on the control trials and were included in the analyses. The mean scores for each symmetrical judgment type by language are given in Figure 1.

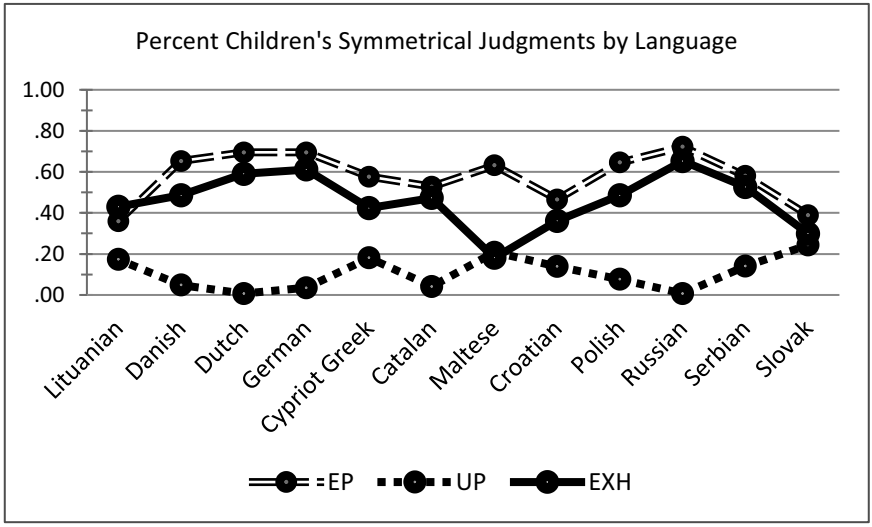

Figure 1. Mean scores for children's symmetrical judgments across languages

A Generalized Linear Mixed model (logit) analysis with Laplace Approximation with EP, EXH, and UP judgment types and age group (child, adult) as fixed effects and participants and items as random effects revealed that EP, EXH, and UP judgment types and age group were all significant predictors of response accuracy. These results were supported by descriptive statistics. The children overall produced EP judgments (Mean: 58%, Mean SD: .38, Range: 36%

(Lithuanian) – 72% (Russian)) significantly more often than EXH judgments (Mean: 44%, Mean SD: .35, Range: 18% (Maltese) – 65% (Russian)), EP judgments significantly more often than UP judgments (Mean: 11%, Mean SD: 21, Range: 1% (Dutch, Russian) – 24% (Slovak)) and EXH judgments significantly more often than UP judgments. The results showed only two exceptions to these patterns. Lithuanian children produced EXH judgments (43%) more often than EP judgments (36%) and the Maltese children produced UP judgments (21%) slightly more often than EXH judgments (18%).

These differences in overall judgment type rates are largely in line with previous findings. However, children's EXH judgment rates were surprisingly robust when compared to previous reports. These results suggest to us that EXH judgments are not the judgments of inattentive children, as previously claimed, but constitute a legitimate judgment type for acquisition research. The low overall mean UP judgment rate we report is consistent with Gavarró and Escobar's report of low UP judgment rates in Catalan, but it is considerably lower than Aravind et al's (2017) reported UP judgment rates for 4-6-year old English speakers (see above). The variation in UP judgment rates across languages make us hesitate to agree with Aravind et al that UP judgments are produced by children who do not understand universal quantification.

Our statistical analyses so far suggest that there is remarkable uniformity in judgment rates across languages. Although more analysis is needed, our results suggest only that the Dutch and Russian children produced EP judgments significantly more often than the other children (69% and 72%, respectively) and that the Maltese children produced EXH judgments significantly less often (18%) than the other children. The results provide little support for Kang's or Geurts' Partial Competence accounts of EP judgments. We did not find significantly higher EP judgment rates for quantificational adjective languages in general, or in Polish and Russian in particular, than for quantificational determiner languages, as Kang's account predicts. We also did not elicit similar rates of EP and UP judgments from children, as Geurts' Weak Quantification account predicts. Our results did reveal robust EP and EXH judgment rates overall across languages. This is consistent with the first stage of Roeper and colleagues' Acquisition Path model. The challenge for this account is why the Maltese children were so much more successful on EXH judgment tasks than the other children. The generally uniform performance of the children across languages also provides qualified support for Full Competence accounts, which characterize EP judgments as methodological artifacts. However, the exceptional behavior of Dutch and Russian children on EP judgment trials suggest to us that linguistic factors may have contributed to EP judgment rates in our experiment.

We speculate that the relatively higher EP judgment rate in Russian may be attributable to the lack of transparency of gender concord in Russian as compared to other Slavic languages such as Polish. While Polish children acquire gender distinctions early, this process is delayed in Russian (Smoczyńska 1985). Unlike in Polish, stressed endings on Russian neuter, masculine, and feminine nouns are rare (Janssen 2014:123). Any linguistic explanation should, of course, be

considered with caution given the many other variables which may have also led to the Russian children's performance and that gender concord in the children's performance in the other Slavic languages has not yet been considered. This explanation also leaves us with the puzzle why transparency of Russian gender concord did not lead to significantly higher EXH or UP judgments by Russian children.

We consider the highly uniform EXH judgment rates from children across languages overall as new qualified support for Full Competence accounts, which predict uniform behavior across languages when identical methodology is used. Further research and analysis is needed to understand the Maltese children's outstanding performance on EXH judgment trials in our experiment. We speculate that the Maltese children's EXH judgment rate is exceptionally low because the Maltese children overall were at an earlier stage in the acquisition of domain restriction principles for universal quantifiers when the experiment was conducted. The key observation behind this speculation is that correctly accepting test sentences on EXH judgment trials and incorrectly accepting test sentences on UP judgment trials both involve ignoring exceptions to distributive relations depicted in visual contexts when evaluating test sentences. Our results show that the Maltese children, when compared to the other children, were particularly prone to producing UP judgments (21%). Aravind et al (2017:13) suggested that children who make UP judgments are at a relatively early developmental stage at which they semantically analyze *every* as a plural existential (weak) quantifier and "accept . . . "Every X is Y" as long as there are multiple Xs that are Ys." These informal truth conditions describe not only failure on UP judgments but also success on EXH judgment tasks. This leads us to a novel hypothesis, namely that EXH and UP judgments (rather than EP and EXH judgments (Roeper et al) or EP and UP judgments (Geurts)) are related in the acquisition of universal quantification.

5. Conclusion

In this paper we presented initial results from a large scale crosslinguistic experiment investigating the robustness, uniformity, and developmental trajectory of symmetrical judgments across 12 European languages. We briefly considered the ramifications of these results for Partial Grammatical Competence and Full Grammatical Competence accounts, which raise new questions for further research.

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