

A UG-based exploration of children's use of *the*

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Abstract. English-learning-children have been shown to use “the” in a non-adult-like manner, to refer not only to discourse-old referents but also to discourse-new ones in many contexts. Here, we explore a novel semantic hypothesis for this acquisition observation, whereby the distribution of “the” in children’s speech is a result of their semantic representation for this item being identical to bare nominals in so-called “article-less” languages. This hypothesis predicts that children must overuse “the” only in those contexts where article-less languages independently license bare nouns, and not elsewhere. Across two experiments, we utilized a free production task where participants filled in missing NPs in children’s stories. The results were found to be overall consistent with our hypothesis, though there are some alternative interpretations to be further explored in future work.

Keywords. Universal Grammar hypothesis; bare nouns; article-less languages; acquisition of determiners; English definite article

1. Introduction. The current study lies at the intersection of two types of language-related empirical phenomena: one pertaining to the distribution of “bare” noun phrases within article-less languages, and another pertaining to English-learning children’s acquisition of the definite article *the*. We take as our point of departure here the well-known finding from acquisition that English learners, even until the relatively late age of 5 y.o., do not use the definite article in an adult-like manner (e.g., Maratsos 1974; Karmiloff-Smith 1979; Schafer & de Villiers 2000; Schaeffer & Matthewson 2005; van Hout et al. 2010; inter alia). In this project, we explore an explanation for the observed distribution of the definite article in children’s speech whereby it is a consequence of an underlying, interim representation that resembles bare noun phrases within article-less languages. In this introductory section, we motivate such a hypothesis by providing an overview of the relevant literature on article-less languages and on the acquisition of English determiners.

1.1. BARE NOUNS IN ARTICLE-LESS LANGUAGES. Around 30% of the world’s languages belonging to diverse language families may be classified as article-less languages, so called as a result of lacking lexical counterparts of indefinite and definite articles (e.g., *a* and *the* in English). Instead, these languages productively license “bare” nominals that are unaccompanied by any overt articles to express both indefinite-like and definite-like meanings. For example: in Kannada, an article-less Dravidian language, the bare noun *naayi* (literally: “dog”) receives an indefinite interpretation in certain episodic contexts (akin to English “a dog”), while in others it receives a definite interpretation (English “the dog”).¹ Other examples of article-less languages include Mandarin (Sino-Tibetan: Jenks 2018), Thai (Kra-Dai: Jenks 2015), Korean (isolate: Ahn 2017, 2020), Hindi (Indo-Aryan: Dayal 1992, 1999, 2004), Russian (Slavic: Dayal 2004) among

* We thank the linguistics program and English department at William & Mary, the participants of the linguistics research group meetings and the reviewers and audiences at LSA 2024 for their support and valuable feedback. Authors: Kaitlyn Harrigan, W&M (kharrigan@wm.edu), Sadhwi Srinivas, W&M (ssrinivas@gmail.com), Chloe Kim, W&M (cakim01@wm.edu) & Josie Summers, W&M (jsummers@wm.edu).

¹ Bare nouns are also licensed alongside kind-level predicates in non-episodic contexts, where they refer to kinds rather than individuals. These are not particularly relevant for the current project, as we limit our discussion to episodic contexts alone.

several others (see Dryer 2013 for a more complete list). Such wide-spread existence of article-less languages undercuts the overwhelming historical focus in linguistics and philosophy on specific lexical articles as the source of (in)definiteness, and raises a puzzle about how exactly speakers of such languages are able to distinguish the intended meaning of the bare noun in a given context.²

Research on bare nominals in the past two decades has led to a number of semantic analyses that differ from each other to varying degrees. Setting aside their details, a common thread unifying much recent work on these items is that they all build directly upon theoretical analyses of semantically similar items in better-studied languages such as English or German. For example, Dayal (2004) proposes a neo-Carlsonian analysis for Hindi bare plurals that exactly mirrors the semantics of bare plurals in English, building closely on Chierchia (1998). Jenks (2015, 2018) equates the semantics of the definite interpretations of bare nouns in Thai and Mandarin to that of the uniqueness-based, “weak” definites in German (Schwarz 2009). Crucially, despite a single surface form expressing both indefinite and definite meanings, previous proposals for the bare nominal have implicitly adopted an English-like perspective in which there are effectively two underlying representations for this item – one corresponding to each type of interpretation. Under this view, the presuppositionally stronger “definite” version of the bare noun is privileged over the weaker “indefinite” version (by the pragmatic economy principle of Maximize Presupposition!; Heim 1991) – so that the definite reading arises so long as the context supports it. This justifies the commonly adopted methodological strategy in which the two interpretations of the bare nouns are independently studied. Such a strategy, however, has thus far found limited success in accounting for the distribution of bare nouns in article-less languages.

An alternative bottom-up approach towards the semantics of bare nouns explicitly foregoes any assumptions carried over from better-studied languages. The bare noun in this approach is taken to be truly underspecified, so that the study of its definite-like and indefinite-like interpretations cannot be separated (e.g., Heim 2011).³ In the context of a common universality assumption that building blocks of meaning are common across languages despite surface-level variation in form (a Universal Grammar (UG) based assumption), such a bottom-up analysis effectively rejects the dichotomy between indefiniteness (as expressed by English “a”) and definiteness (as expressed by English “the”) as a crosslinguistic universal. Instead, a new prospect opens up, where the underspecified meaning of the bare noun is in fact the universal upon which the individual semantics of the English determiners rests. In other words, the possibility may now be explored of porting insights from the bottom-up analysis of bare nominals to the determiners *a/the* in English – especially to account for observations surrounding these articles that have resisted easy explanation under standard accounts.

In this article, we focus on one such observation that has defied easy explanation: namely, English-learning children’s acquisition of the definite article *the*. Specifically, we explore a hypothesis for the distribution of *the* in children’s speech that appeals to an interim representation of the article that resembles that of bare nouns within article-less languages.

1.2. ENGLISH-LEARNING CHILDREN’S USE OF *THE*. A well-known result in the acquisition literature pertains to English-learning children’s difficulty with acquiring the determiners *a* and *the*. Even

² Note that English too licenses article-less bare plurals to convey kind-level and certain types of existential readings. We do not count English as an article-less language, however, due to the presence of articles *a* and *the*. Crucially, article-less languages productively license bare singulars in episodic contexts.

³ See Srinivas (2021) for an underspecification-based analysis of bare nouns in the Dravidian language, Kannada.

until the age of five, children have been shown to use *the* in a non-adult-like manner, not only to refer to discourse-old referents but also to discourse-new ones where adults necessarily use *a*. An example of this observed behavior from Schafer & de Villiers (2000) is given below:

- (1) Three ducks and two dogs were walking over a bridge. One of the animals fell off and said, “Quack!” What was it?

Adult-like target: *a duck!*

Common child response: *the duck!*

While such overuse of *the* in children’s speech (henceforth: *the*-overuse) is relatively well-attested, the understanding of how long it persists, where it occurs, and what exactly brings it about is shakier. While contexts in which *the* isn’t licensed (and therefore where *the*-overuse is observed in children’s speech) are necessarily ones where the referent is unknown to the hearer, they may vary with respect to the speaker’s knowledge of the referent. Schafer & de Villiers (2000) claim *the*-overuse occurs only where the referent is also unknown to the speaker, but Schaeffer & Matthewson (2005) report it precisely where the referent is known to the speaker. Studies also differ in terms of the methodology used to measure the presence or absence of *the*-overuse. Schaeffer & Matthewson (2005) and Karmiloff-Smith (1979) use visual cues in addition to verbal stimuli in their elicitation of determiners with child participants. By contrast, Maratsos (1974) and Schafer & de Villiers (2000) use purely verbal cues – citing the possibility that scenarios where a specific object is visually singled out may independently license the use of the definite article, despite the object’s absence in the linguistic common ground.

Finally, explanations surrounding children’s *the*-overuse are varied as well. Some authors offer a purely semantic or grammatical explanation. Wexler (2011), for instance, attributes *the*-overuse to an incorrect representation of the presuppositions associated with the definite article in children. Others offer pragmatic explanations in which children are unable to accurately reason about their interlocutor’s representations independently of their own (e.g., Maratsos 1974; Schaeffer & Matthewson 2005). We take such disagreements in the literature to indicate that a complete and satisfactory explanation for children’s *the*-overuse is yet to be uncovered. Accordingly, here we introduce a novel hypothesis to explain the distribution of the definite article in children’s speech.

1.3. A NOVEL HYPOTHESIS. We take an approach where the semantics of the English articles *the* and *a* build upon a single underlying bare nominal-like meaning. This leads to a specific UG based hypothesis in which children acquire an underlying bare-noun-like meaning at an earlier stage of acquisition, and only later learn the language-specific constraints distinguishing *the* from *a*. Prior to acquiring these language-specific constraints, *the* is employed as the default form encompassing the full range of bare noun meanings.

Importantly, such a view predicts that the *the*-overuse by children must only occur in contexts where bare nominals are grammatically licensed across article-less languages and not elsewhere, regardless of what is used by adult English speakers in those contexts. Accordingly, we expect English-learning children to overuse *the* with novel referents only if speakers of article-less languages are able to use a bare nominal for that referent. An example of such a context is given in (2), where the highlighted expression *a raccoon* conveys the existence of a discourse-novel mouse but whose identity is nevertheless not likely to be critical to the ongoing discourse.

- (2) Lately, I’m noticing so many raccoons in the neighborhood. Yesterday, there was **a raccoon** roaming around in our backyard. Today, I even saw a raccoon at the grocery store!

Conversely, in certain other contexts, including ones where the definite article is grammatically licensed in English, the current hypothesis predicts that children must not be inclined to (over)use the article. These are contexts where bare nouns are reported to be odd by speakers of article-less languages, such as (3) – in which the highlighted expression introduces a novel referent central to the upcoming discourse, or (4) – where the highlighted anaphoric expression is introduced in a different spatiotemporal situation than its antecedent. In the former case, article-less languages require a modifier like “one” within the NP, in the latter, they require a demonstrative article. Crucially, however, bare nouns are disallowed.

- (3) Once upon a time, there lived **a farmer** in a remote village.
- (4) On Monday, there was **a raccoon_i** roaming around in our backyard. Today, I saw **the raccoon_i** at the grocery store!

Across two experiments, we utilized a free production task to test the predictions of our hypothesis, where participants filled in missing NPs in children’s stories that instantiated different types of contexts. We turn to describing these experiments next.

2. Experiment 1: Adults’ use of the definite article. Experiment 1 utilizes a “fill-in-the-blank” procedure. In this task, adults read short stories and are asked to fill in missing Noun Phrases, allowing us to compare determiner use across various contexts.

2.1. PARTICIPANTS. Participants were twenty-five adult native English speakers. Participants were all William & Mary undergraduates enrolled in introductory Linguistics or Psychology courses and recruited from the SONA participant pool management system. All participants received course credit for their participation in the study.

2.2. DESIGN AND MATERIALS. We constructed four short stories, creating contexts that elicited NPs containing determiners *a* and *the*. We manipulated contexts that elicit NPs with *a* or *the* in English, and where article-less languages allow or disallow bare nouns (BN). The design included all combinations of *a/the* and BN/no-BN (Table 1).

condition	English target	articleless language target
<i>a</i> <u>BN</u>	<i>a</i>	bare noun
<i>a</i> <u>noBN</u>	<i>a</i>	no bare noun
<i>the</i> <u>BN</u>	<i>the</i>	bare noun
<i>the</i> <u>noBN</u>	<i>the</i>	no bare noun

Table 1. Conditions

Each of the four stories was four sentences long, with each sentence containing a context from one of the four conditions, leading to 16 total test items per subject. The stories all followed a similar format, with conditions presented in a consistent order across all four stories. See Table 2 for an example story.

condition	example sentence
<i>a_noBN</i>	<i>I was at the park, and I met...</i>
<i>the_noBN</i>	<i>But then I realized it was not actually a new friend because when I was at the park last week, I had already met...</i>
<i>a_BN</i>	<i>I love <u>dogs</u>, but my sister doesn't like them because when she was younger, her lunch got stolen by...</i>
<i>the_BN</i>	<i>Fun fact about <u>dogs</u>, they love warm weather! I always see them lying around warming themselves in...</i>

Table 2. Example story

The task was deployed via Qualtrics. Participants were instructed that they were going to read some short children's stories with phrases missing, and their task was to type in the missing phrases. Each story was deployed one sentence at a time, so that participants filled in each missing sentence independently and could not edit previous responses. The stories were designed to elicit a category of noun (e.g., *animals* in Table 2), used by the researcher in later sentences (underlined in Table 2). Because Experiment 1 was distributed in written form, we were unable to predict participants' initial noun choice. Thus, the first sentence of each story (Table 2, *a_noBN*) was a multiple choice item ("a dog" vs. "the dog"). This allowed us to use the target noun later in the story without inconsistency (in case the participants had chosen a different member of the target category).

2.3. RESULTS. Adults overwhelmingly produced the target *a* and *the* responses across all conditions. We coded all responses into five categories: *a*, *bare noun*, *other-definite*, *other-indefinite*, and *the*. See Table 3 for examples of each response type.

Response type	Example responses
<i>a</i>	"a dog", "a pet"
<i>bare noun</i>	"dogs", "sunlight"
<i>other-definite</i>	"it", "him"
<i>other-indefinite</i>	"one", "another one"
<i>the</i>	"the dog", "the sun"

Table 3. Example response types

Figure 1 shows the full range of responses. In each case, the most common type of response was the target: "a N" in the *a*-target conditions and "the N" in the *the*-target conditions. We found the most variation in the *the_noBN* and *a_BN* conditions. In *a_noBN* there was no opportunity for variation, as those items were multiple choice responses.

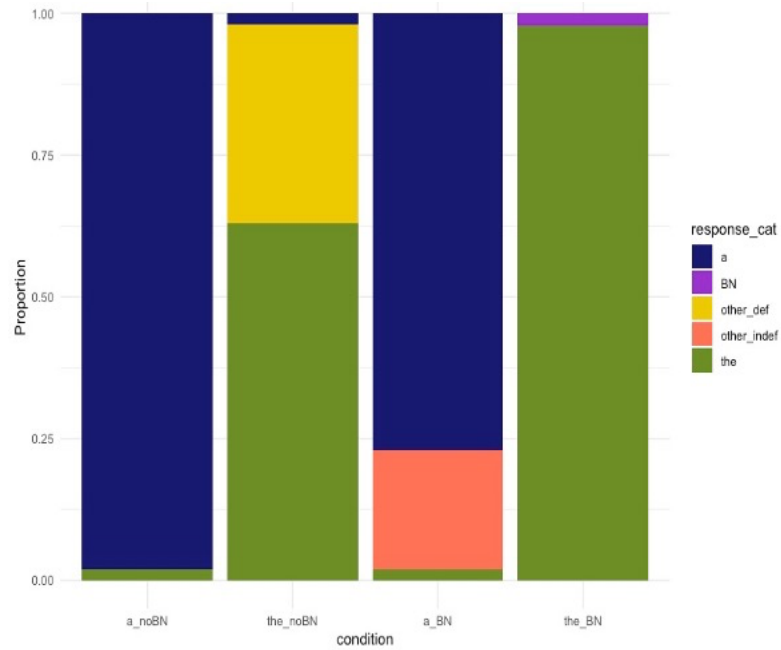


Figure 1. Experiment 1: all responses

Overall, 84% of total responses fell into the target *a/the* categories. For the remaining analyses, we focus on only the *a/the* responses (Figure 2).

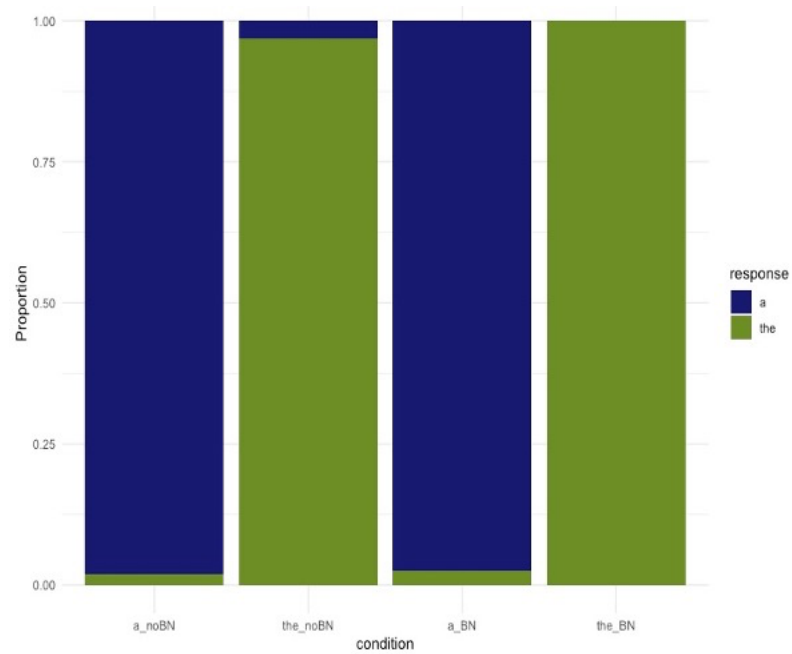


Figure 2. Experiment 1: *a/the* responses only

The results were analyzed using a generalized linear mixed effects model (Baayen 2007; Jaeger 2008). The model was a mixed-effect logit model with *the*-responses as the dependent measure,⁴ with *condition* as a fixed effect, and *subject* and *story* as random intercepts. We use the *the_BN* condition as a reference condition. We find that participants perform as expected, giving more *the* responses in *the*-target conditions than in *a*-target conditions. The two *the*-target conditions are not different from each other ($\beta = -1.13$, $SE = 1.25$, $z = -0.90$, $p = 0.37$), while the *the_BN* condition is different from both *a_BN* ($\beta = -9.22$, $SE = 2.08$, $z = -4.42$, $p < 0.0001$) and *a_noBN* ($\beta = -9.44$, $SE = 2.07$, $z = -4.57$, $p < 0.0001$).

The purpose of Experiment 1 was to validate our stories and study design before testing children's grammar. We find that the stories are successfully eliciting the target *a* and *the* responses in adults.

3. Experiment 2: Children's use of the definite article. Experiment 2 utilizes an elicited production task with English-learning preschoolers. In this task, children were prompted to fill in missing Noun Phrases in children's stories, allowing us to again compare determiner use across varying contexts.

3.1. PARTICIPANTS. Participants were 13 monolingual English-learning preschool children aged 4;0-5;6 (mean = 4;9) recruited from the Williamsburg, VA area, and tested either at their local preschools or in the Child Language Lab at William & Mary. Participants were only run if they gave verbal assent and the researchers had received a completed consent form from the parent or legal guardian.

3.2. DESIGN AND MATERIALS. We used the same four stories described in section 2 (Table 2), with contexts eliciting *the* and *a* across four conditions including all combinations of *a/the* and BN/no-BN (Table 1). The stories were read aloud, with rising and slowing intonation prompting them to fill in missing words. Children were told that the researcher "needs help writing some stories for kids", and asked if the child would be willing to help finish the stories. Children did not have difficulty gauging when they were expected to fill in missing words, and were generally compliant in participating in the interactive story. Like in Experiment 1, each participant heard all four stories, each of which had one context from each of the four conditions, leading to 16 total test items per subject. The entire game took less than 10 minutes per participant.

3.3. RESULTS. We coded children's responses into the same categories as in Experiment 1 (Table 3). Figure 3 shows the full range of children's responses. The children show more variation than the adults, however, in each of the conditions, most of the responses are either *a* or *the*. Like with the adults, children's responses had the most variation in the *the_noBN* and *a_noBN* conditions.

⁴ In the *the_BN* condition, one "the" response was changed to "a", as models of this type require at least one response of each value across each combination of conditions.

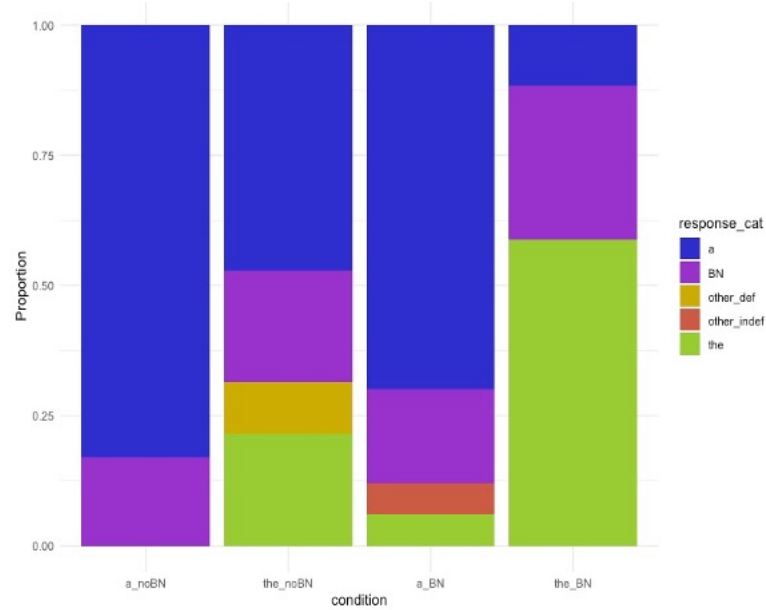


Figure 3. Experiment 2: all responses

Again, we focused the remaining analyses on *a* and *the* responses (66% of total). The majority of divergent responses were BNs, produced uniformly across conditions at a rate (28%) similar to that reported in previous studies, where BN responses were considered task misinterpretations. After restricting to just *a* and *the* responses, we find that in three of the four conditions, children are adult-like in their responses (Figure 4). In the fourth condition (*the_noBN*), children underuse *the* (44%, compared to adults' 97%).

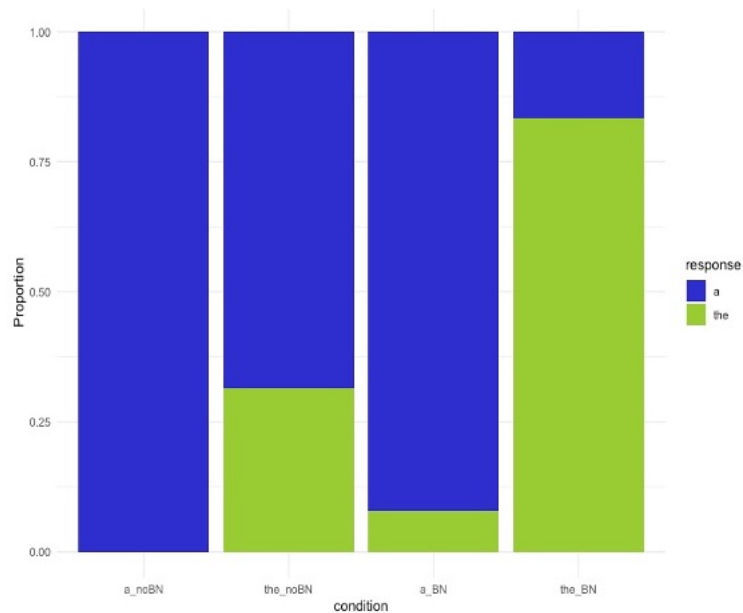


Figure 4. Experiment 2: *a/the* responses only

The results were again analyzed using a generalized linear mixed effects model. The model was a mixed-effect logit model with *the* responses as the dependent measure,⁵ with *condition* as a fixed effect, and *subject* as a random intercept. We again use the *the_BN* condition as a reference condition. In both *a*-target conditions, participants give majority *a* responses: both *a_noBN* ($\beta = -7.75$, $SE = 1.66$, $z = -4.66$, $p < 0.0001$) and *a_BN* ($\beta = -6.46$, $SE = 1.46$, $z = -4.44$, $p < 0.0001$) are significantly different from our reference condition. However, unlike adults, children perform differently in the two *the*-target conditions ($\beta = -3.38$, $SE = 0.86$, $z = -3.94$, $p < 0.0001$), giving a majority *a* responses on the *the_noBN* items, and a majority *the* responses on the *the_BN* items. Three out of four conditions are consistent with the adult-like English grammar, and three out of four conditions are consistent with an article-less language grammar.

4. Discussion. In this study, we set out to test a novel UG-based hypothesis to explain children’s non-adult-like use of the English definite article *the*, wherein their errors follow from an erroneous representation for *the* that is more akin to bare nouns in article-less languages like Mandarin or Kannada than to adult-like *the*. This hypothesis predicts that children must not be indiscriminately inclined to use *the*, as previous studies have tended to suggest. Instead, they must only do so in contexts where article-less languages permit the use of bare nouns – even if English does not (our *a_BN* condition). Conversely and crucially, *the*-overuse is not predicted in contexts where bare nouns are not licensed in article-less languages – even if English does permit the use of the definite article (*the_noBN* condition). In these cases, we might even expect to see *the*-underuse compared to adult native speakers. In contexts where the distribution of *the* in English aligns with the distribution of the bare nominal in article-less languages (*the_BN* and *a_noBN*), we expect children to show adult-like behavior, neither under-using nor over-using the definite article compared to adults.

Our data indicate that children’s behavior was in line with our predictions in three out of four conditions. In the *the_BN* and *a_noBN* conditions, children showed adult-like behavior. However, as these are conditions where English licenses *the* while article-less languages license the bare noun, this result is not particularly informative to adjudicate between the UG-based hypothesis and one where children are simply equipped with a completely adult-like grammar. In the *a_BN* condition, contrary to what the UG-based hypothesis predicts, we did not observe any *the*-overuse; here as well, children showed adult-like behavior. It is worth noting this result is not only a challenge to the current hypothesis, but also to previous ones that expect to find *the*-overuse in contexts where more than one entity of the same kind is introduced in the context, such as Schafer & de Villiers (2000).

Finally, in the *the_noBN* condition, we find that children in fact underuse *the* when compared to adults, in line with what is predicted by the UG-based hypothesis. Recall this condition consists of anaphoric contexts characterized by a spatiotemporal shift. In these cases, English licenses *the* to achieve anaphoric reference. However, at least some article-less languages (like Mandarin/Kannada) do not permit the use of anaphoric bare nominals, requiring the use of an overt demonstrative determiner instead. Children’s behavior in this condition is promising for a view that assumes an underlying bare noun-like representation for *the*, though some details remain puzzling. If the child participants in this condition seek to avoid the use of *the* but are nevertheless aware of the intended anaphoric interpretation, we might expect them to use alternative

⁵ In the *the_BN* condition, one “the” response was changed to “a”, as models of this type require at least one response of each value across each combination of conditions.

anaphoric forms – for example, the demonstrative determiner *that*. But this is not what we observe – children predominantly use the indefinite article *a* instead. It is possible that children’s use of *a* here despite an anaphoric interpretation is simply because they have not yet acquired the anaphoric use of *that*. In a recent study that tested children’s comprehension of anaphoric *that*, Ahn & Arunachalam (2020) found that children do not show an adult-like understanding of anaphoric *that* until four years of age; it is possible that production takes even longer. Under this explanation, which is compatible with the UG-based hypothesis, the children in our study used *a* as a last resort.

However, an alternative explanation exists, wherein it is possible that children did not interpret the context in our *the_noBN* condition as one that refers to a previously mentioned entity. Recall that items in this condition involved a change in the spatiotemporal situation. If the child participants assumed that the same object is unlikely to persist across situations, the context is no longer anaphoric, thus a response with the indefinite article would be entirely appropriate. A follow-up study that ensures an anaphoric interpretation is being obtained – perhaps by presenting a series of visual cues for the story prior to the verbal task – can help disambiguate between the two interpretations of children’s behavior in *the_noBN*.

It is worth noting, nevertheless, that the adults in Experiment 1 had no trouble interpreting the context in *the_noBN* as anaphoric. Moreover, in this condition, adults used alternative definite forms – such as the demonstrative *that* or other definite pronouns – at a much higher rate compared to our *the_BN* condition. This may be solely driven by the fact that such alternative forms are not even licensed in the *the_BN* condition. However, if there is indeed some deep underlying connection between the English definite article and bare nouns in article-less languages (as the UG-based hypothesis leads us to believe), there may be more to the adults’ behavior here. In particular, a spatiotemporal shift may introduce a dispreference for *the* in contrast to situations where there is no such shift, but where alternative definite forms are still licensed – an idea we are currently pursuing in a follow-up study.

5. Conclusion. This study explores a novel hypothesis for investigating the errors made by English-learning children in their use of *the*, which introduces a shift in what type of language is implicitly viewed as a default starting point in both theoretical linguistics literature. The results are promising albeit yet inconclusive, with follow-ups underway.

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