Adaptation and validation of MAIN for Ukrainian: Insights into story structure and story complexity in Ukrainian-Russian bilinguals

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The present paper focuses on the adaptation and validation of the Multilingual Assessment Instrument for Narratives (MAIN) for Ukrainian, drawing on data collected from 18 typically-developing Ukrainian-Russian bilingual children aged six to nine years (mean age = 7;7). Data were collected between August and September 2022, with all participants arriving in Germany after the onset of the full-scale war in Ukraine in February 2022. The paper has two main objectives. First, it outlines the process of adapting MAIN to Ukrainian and, using data from both Ukrainian and Russian, it addresses the systematic challenges encountered during analysis that may also apply to other languages. Second, the paper presents findings related to macrostructure measures—specifically, story structure and story complexity—in the children's narratives across both languages. Importantly, this study offers valuable insights into the macrostructural skills of the children, considering not only the languages themselves but also the role of language dominance.

1   Introduction

Since its initial development, the Multilingual Assessment Instrument for Narratives (MAIN) has been adapted to numerous languages. As of May 2025, MAIN is available in 92 languages (Multilingual Assessment Instrument for Narratives, 2025). Yet, until 2022, no Ukrainian version existed. With the large-scale displacement of Ukrainians across the globe, particularly to Europe and North America in 2022, there arose an immediate demand for an adaptation of the instrument into Ukrainian.

This paper has two main objectives.[1] First, it describes the process of adapting MAIN to Ukrainian, addressing specific linguistic challenges and proposing adjustments to the scoring protocols. During our analysis of Ukrainian and Russian data, we identified several recurring issues that require further discussion, which we believe may be relevant for other languages as well. Second, using data from 18 Ukrainian-Russian bilingual children assessed with MAIN, we present findings on two macrostructural measures – story structure and story complexity – across both languages. In doing so, we aim to contribute to the ongoing research on bilingual children's narrative skills across their two languages, addressing the contradictory findings of previous studies.

The article is structured as follows. In Section 2, we present a brief overview of the Ukrainian language. Section 3 explores bilingualism in Ukraine, discussing the historical reasons behind its development and describing current language attitudes and the state of bilingualism in the country. In Section 4, the adaptation of the MAIN to Ukrainian is discussed, highlighting the challenging cases encountered during the analysis of Ukrainian and Russian productions. Section 5 reviews previous research on narrative skills in bilingual children. Following this, Section 6 outlines the aims of the study. The methodology, including participant demographics, materials, and procedures for calculating language dominance and story complexity, is described in Section 7. Section 8 presents the results regarding story structure and story complexity in Ukrainian-Russian bilingual children, analyzed by both language – Ukrainian and Russian – and language dominance. Finally, Section 9 offers a discussion of the findings, concluding that the results on the macrostructural skills of Ukrainian-Russian bilingual children align with much of the existing research suggesting that narrative skills are acquired universally and can be transferred between languages.

2 Ukrainian

Ukrainian is an East Slavic language belonging to the larger Indo-European language family and is written using the Cyrillic alphabet. There are several theories as to the emergence of the Ukrainian language. In the Soviet times, the prevailing view was that the beginning of the Ukrainian language, like those of Russian and Belarusian, dated back to the 13th–14th centuries, and the three languages emerged from the Old East Slavic language (Filin, 1972; Medvedev, 1955). However, modern linguists criticize this theory and argue that Ukrainian developed from the Proto-Slavic language, independently from Belarusian and Russian (Shevelov, 1994; Pivtorak, 2019). In terms of lexical similarity, Belarusian is the closest language to Ukrainian, with 84% shared vocabulary, followed by Polish (70%), Slovak (68%), and Russian (62%) (Pivtorak, 2019). Ukrainian morphology is characterized by a rich system of inflection, where nouns, pronouns, and adjectives are marked for case, number, and gender, leading to a high degree of syntactic flexibility. Ukrainian is a language with free word order, but the typical word order is SVO, where variations mostly occur for emphasis or stylistic reasons (Press & Pugh, 1999).

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[1] Parts of this paper originate from one of the author's unpublished Master's thesis.

3   Bilingualism in Ukraine

Bilingualism in Ukraine has deep historical roots shaped by centuries of sociopolitical dynamics, including the influences of imperial rule, Soviet policies, and complex cultural exchanges. From the 17th to the 20th centuries, the territory of modern Ukraine was divided between various states and empires, in particular the Polish-Lithuanian Commonwealth, the Austro-Hungarian Empire, the Russian Empire, and later the USSR, all of which enforced policies aimed at assimilating the Ukrainian population and suppressing the Ukrainian language and culture (see Plokhy, 2005, 2015; Portnov, 2020). The Russian Empire's territorial expansions in the 18th and 19th centuries introduced significant Russification policies, which continued under Soviet rule. For instance, the 1938 Soviet decree enforced the study of Russian in all schools across Soviet republics, including Ukraine, further establishing Russian as the language of administration, education, culture, and public life. These policies resulted in widespread bilingualism, with many Ukrainians becoming proficient in both Ukrainian and Russian, and established Russian as a dominant linguistic presence across many regions, particularly in urban centers, the eastern and southern parts of Ukraine (see Bilaniuk & Melnyk, 2008; Shevelov, 1987; Masenko, 2005; Sokolova, 2022).

After gaining independence in 1991, Ukraine pursued policies to reestablish Ukrainian as the primary language of public life, education, and administration. This was formalized with the 1989 declaration of Ukrainian as the state language, followed by independence-driven reforms aimed at increasing Ukrainian usage in education and media (Bowring, 2011; Azhniuk, 2017). However, Russian continued to have significant influence in the eastern and southern parts of the country, while Ukrainian remained prevalent in the western parts, creating a bilingual environment where language use varied by region and context (see Taranenko, 2007; Bilaniuk, 2010, 2018; Kulyk, 2015; Lakhitova, 2017).

The sociopolitical and linguistic landscape changed notably after the 2014 Euromaidan protests, Russia's annexation of Crimea, and the war in Donbas, culminating in the full-scale Russian invasion on February 24, 2022. This has led to a number of legislative measures that have established Ukrainian as the primary language in public sectors while also protecting linguistic rights of ethnic minorities (see Place & Everett, 2024; Masenko, 2019a).

The political events have also reflected on language attitudes and language use in Ukraine (Kulyk, 2016, 2018, 2024; Bilaniuk, 2018; Barrington 2022; Racek et al., 2024). Recent surveys indicate a positive shift toward Ukrainian, particularly since 2014, while attitudes toward Russian have generally declined (e.g., Ilko Kucheriv Democratic Initiatives Foundation & Razumkov Centre, 2022; KIIS, 2019, 2022). This, in turn, has led to increased usage of Ukrainian. For instance, Figure 1 shows that the percentage of people using Ukrainian in their daily lives increased from 2017 to 2022 (KIIS, 2022).
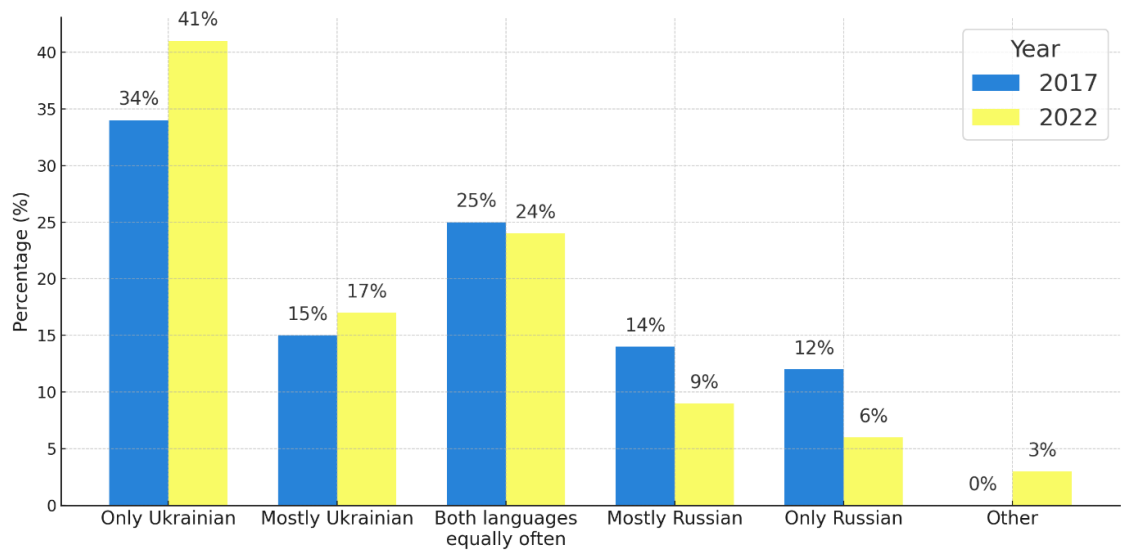
Figure 1. Languages spoken in everyday life in Ukraine (2017 vs. 2022) (KIIS, 2022).

Despite this shift, many Ukrainians continue to use both languages. As shown in Figure 1, while 41% of respondents reported using only Ukrainian and 6% only Russian in 2022, over 50% indicated that they use both languages. However, these percentages vary significantly across different regions of Ukraine, as illustrated in Figure 2 (KIIS, 2019). In the western regions of the country, 80% of respondents speak only Ukrainian. The central and southern regions show significant use of both Ukrainian and Russian, with 32.8% in the central regions and 32.1% in the southern regions using both languages equally often. In the eastern part of the country, 36.3% use both languages, while Russian remains dominant in the Donbas region, the main part of which was already occupied by the year when the survey was conducted.
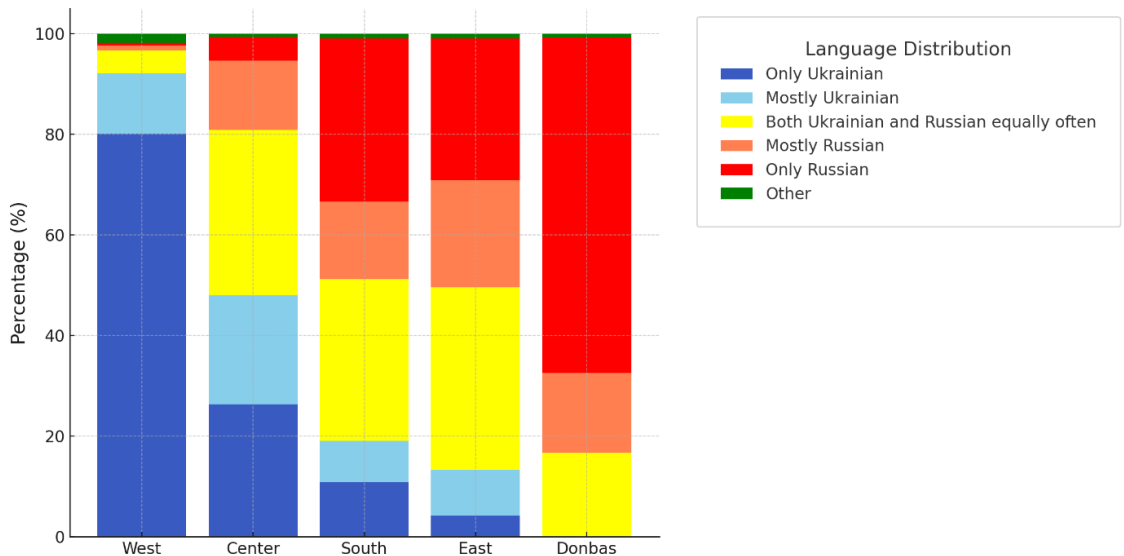

Figure 2. Languages spoken with close relatives in Ukraine by region (KIIS, 2019).[2]

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[2] In 2014, following the Euromaidan protests and the overthrow of the Yanukovych government, Russia annexed Crimea. In the same year, pro-Russian separatists declared the self-proclaimed 'Donetsk People's Republic' (DNR) and 'Luhansk People's Republic' (LNR) (cf. Katchanovski, 2016). Thus, survey data from Donec'k and

Nevertheless, despite diverse language preferences and attitudes, approximately 80-90% of Ukrainians report high proficiency in both Ukrainian and Russian (Sokolova, 2021). While proficiency levels vary by region, the majority of Ukrainians indicate that they speak both languages well or very well, as illustrated in Figure 3.
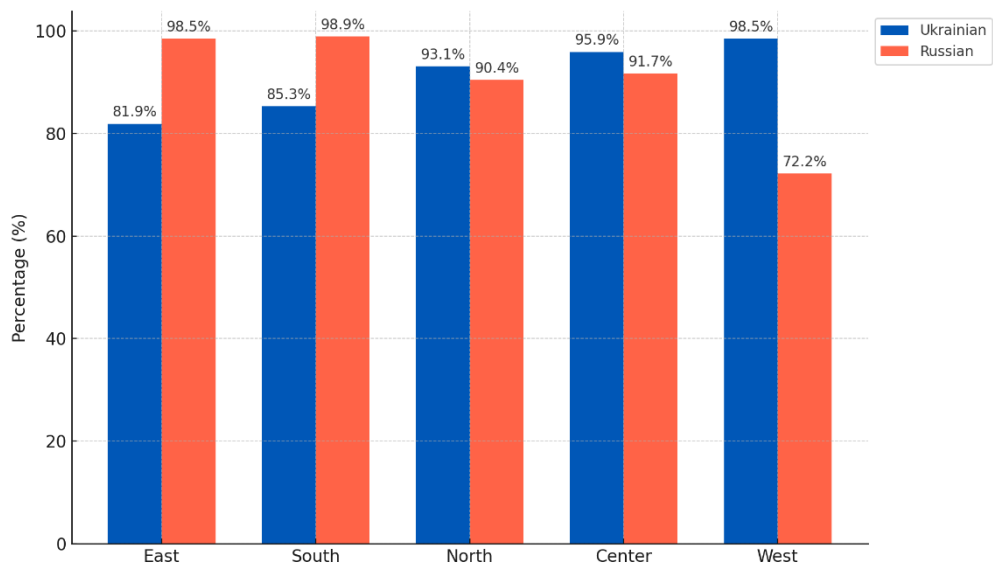

Figure 3. Self-reported proficiency in Ukrainian and Russian by region in Ukraine (survey 2017). Percentages represent the combined total of responses rated as "very good," "good," or "satisfactory" to the question: "How would you assess your level of proficiency in Ukrainian/Russian?" (Sokolova, 2021).

The information and figures above discuss Ukrainian and Russian separately. However, when discussing the linguistic situation in Ukraine, one cannot overlook the phenomenon of *Suržyk*, a fused lect that blends elements of both languages (cf. Del Gaudio, 2010; Hentschel & Palinska, 2022). Despite its informal status and occasional stigma, *Suržyk* is widely used, especially in central, southern and eastern regions of Ukraine, and reflects a linguistic adaptation to Ukraine's bilingual reality (cf. e.g., Bilaniuk, 2004; Del Gaudio, 2010; Hentschel & Taranenko, 2021; Hentschel 2024; Masenko 2019b).

4   Adapting MAIN to Ukrainian

The Ukrainian version of MAIN was adapted from the revised English version of MAIN (Gagarina et al., 2019), following the guidelines for creating new language versions (Bohnacker & Gagarina, 2019). For consistency and cross-language comparability, other Slavic-language versions (Russian, Polish, Croatian, Czech, Serbian and Slovak), as well as the German version, were used as reference points.

The translation and adaptation were conducted by the authors, who are Ukrainian native speakers, and reviewed by a professor of linguistics, a Ukrainian language university lecturer, a speech therapist, and a philology graduate. Following its publication in 2022, the Ukrainian

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Luhans'k regions include only areas controlled by the Ukrainian government, and data from southern region exclude Crimea.

MAIN was implemented in Germany with Ukrainian children and their parents (primarily mothers) who had relocated to Berlin due to the full-scale war in Ukraine.

The remaining parts of this section address specific linguistic challenges in translating and adapting the Ukrainian MAIN. Additionally, using data from both Ukrainian and Russian, Section 4.3 explores the systematic challenges encountered during the analysis, which may also be relevant to other languages.

4.1 Linguistic translation nuances

In the translation process, we encountered several terms that were rarely used in Ukrainian, e.g. *internal state terms, elicitation, code-switching, piloting, production, perception.* We evaluated potential Ukrainian equivalents (e.g., *«перемикання» мовних кодів («peretykannja» movnych kodiv)* 'code-switching', following the English term provided in brackets; *опис внутрішнього стану (opys vnutrišn'oho stanu)* 'internal state terms') and English borrowings (e.g., *еліцитування (elicytuvannja)* 'elicitation', *продукція (produkcija)* 'production', *перцепція (percepcija)* 'perception') by comparing usage frequency and context to select terms that would be accessible to a broad audience.

4.2 Lexical choices for characters

One of the main challenges during the adaptation process was finding suitable words for characters in the MAIN stories, given that Ukrainian has a variety of synonyms, a grammatical gender system, and rich diminutive morphology. For instance, Standard Ukrainian has two neutral terms for 'dog': *пес (pes)* and *собака (sobaka)*. Regional language contact plays a role: in Polish, the term for 'dog' is *pies*, while Russian uses *собака (sobaka)* as a general term and *пёс (pës)* for male dogs. Therefore, *sobaka* might be more commonly used in the eastern regions of Ukraine, while *pes* could be preferred in western regions of Ukraine. To confirm usage trends, we reviewed titles of Ukrainian folk tales (e.g., *Українські народні казки (Ukraïns'ki narodni kazky)* 'Ukrainian folk tales'; *Дитячі книги з малюнками українською (Dytjači knyhy z maljunkamy ukraïns'koju)* 'Children's picture books in Ukrainian') and found *pes* to be used more frequently than *sobaka*. Taking this into account, we chose *pes* for the MAIN dog character.

Similar considerations applied to *cat*, where Ukrainian also has two neutral words: *кіт (kit)*, masculine, and *кішка (kiška)*, feminine. The masculine *kit* is more commonly used in children's stories and was therefore selected to refer to the character.

Ukrainian has a rich system of diminutive suffixes, widely used in children's literature and their everyday language (Samoylenko, 2020; e.g., *Демінутиви української мови (Deminutyvy ukraïns'koï movy)* 'Diminutives in the Ukrainian language'. For instance, the word *птаха (ptacha)* for the mother bird sounds too formal for the MAIN picture stories. The diminutive *пташка (ptaška)* conveys a gentle, approachable quality commonly used in children's literature, making it the preferred choice. This decision was supported by reviews of Ukrainian children's stories and linguistic consultations.

4.3 Challenging cases in the scoring protocols

This section discusses challenging cases in the MAIN scoring guidelines for the production section. The current discussion draws on the observations from narratives in Ukrainian and Russian produced by the children in our study (see Sections 6–8). The aim was to ensure accurate evaluation of children's responses by considering specific linguistic features in both languages, patterns in how children interpreted pictures pragmatically, and developmental factors, such as age, that may affect the detail and precision of their narratives. Key challenges include annotating internal state terms (ISTs) that are not explicitly listed in the guidelines, clarifying criteria for assessing ambiguous cases in narrative components – particularly distinctions between goals (G), attempts (A), and outcomes (O) – and handling incomplete responses and self-repairs. These cases are discussed here, but they were not incorporated into the scoring protocols of the Ukrainian MAIN. However, we suggest considering them for the instrument's next revision.

4.3.1 Evaluating Internal State Terms (ISTs)

Internal State Terms (ISTs) express the inner or mental states of story characters (Gagarina et al., 2019). While evaluating ISTs as initiation events or reactions within the story structure, we encountered some productions that differentiate from the MAIN scoring protocols and show certain patters.

The first challenge involves the pragmatic interpretation of pictures in the *Cat* and *Dog* stories. For example, according to the guidelines, an internal state term (IST) as a reaction (A6) should relate to a reaction of the cat or the butterfly in the *Cat* story and a reaction of the dog or the mouse in the *Dog* story, while an IST as an initiating event (A7) should express the boy's reaction to the ball or balloon. However, some children used an IST as an initiating event related to either the cat or the dog, or in a way that made it unclear whether it referred to the cat/dog or the balloon/ball. For example, in (1), while the boy's reaction is expressed as fear or surprise, it does not directly involve the ball. Instead, the surprise stems from the dog hitting itself, causing the boy to drop the ball. Therefore, we classify the IST as an initiating event (A7) and assign a corresponding score.

(1)
А	*в*	*то*	*время*	*мальчик,*	*увид-ев,*	*как*	*собака*
A	*v*	*to*	*vremja*	*mal'čik,*	*uvid-ev,*	*kak*	*sobaka*
and	at	that	time	boy.NOM.M.SG	see-PST.PTCP	how	dog.NOM.F.SG

удар-и-л-а-сь,	*он/*	*у*	*него*	*был*	*в*	*рук-ах*
udar-i-l-a-s',	*on/*	*u*	*nego*	*byl*	*v*	*ruk-ach*
hit-PFV-PST-F-REFL	he/	at.POSS	3SG.M.GEN	be.PST	in	hand-LOC.PL

шарик	*жёлтый*	*и*	*в*	*рук-ах*	*пакет*	*с*
Šarik	*želtyj*	*i*	*v*	*ruk-ach*	*paket*	*s*
balloon.NOM.M.SG	yellow	and	in	hand-LOC.PL	bag.NOM.M.SG	with

сосиск-ами.	*Он*	*испуг/*	*Он*	*удив-и-л-ся*	*и*
sosisk-ami.	*On*	*ispug/*	*On*	*udiv-i-l-sja*	*i*
sausage-INS.PL	he	fear/	he	surprise-PFV-PST.M-REFL	and

отпуст-и-л   шарик
otpust-i-l   šarik
let.go-PFV-PST.M   balloon.ACC.M.SG

'At that moment, the boy, seeing the dog get hit, was holding a yellow balloon and a bag of sausages. He got scared. He was surprised and let go of the balloon.'

(17CHIDRUS)[3]

Although the number of such examples is low in our data, with only six occurrences identified among the 18 children in both languages, we believe it is important to account for such instances, as they provide a more comprehensive view of children's production of inferred components. After consulting with the Cost MAIN team, we decided to document these cases and assign scores accordingly.

The second challenge was evaluating ISTs when they were expressed through synonyms or descriptions that differed from those in the MAIN protocol. We assigned scores to instances that clearly showed the expected emotion or feeling behind the reaction. For example, in (2), where a negative reaction, such as the baby bird's fear, is expected, the child conveyed this using the verb 'to shout', intensifying it with the phrase *на всё дерево (na vsyo derevo)* 'all over the tree', which serves to underscore the intensity and loudness of the shout.

(2) *И*   *потом*   *она*   *с-лов-ил-а*   *одн-ого*   *из*   *птен-чик-ов*
     I   *potom*   *ona*   *s-lov-il-a*   *odn-ogo*   *iz*   *pten-čik-ov*
     and   then   she   PFV-catch-PST.F.SG one-ACC.M.SG   of   bird-DIM-GEN.PL

     u   *он*   *ор-ал*   *на*   *вс-ё*   *дерево*[4]
     i   *on*   *or-al*   *na*   *vs-yo*   *derevo*
     and   he   scream-PST.M.SG   on   all-ACC.N.SG   tree.ACC.N.SG

'And then she caught one of the baby birds, and it screamed all over the tree.'

(02CHIBBRUS)

However, we cannot assign a score for ISTs as reactions if the reaction is only implied and not verbalized, as in (3).

(3) *козенятко*   *по-бєж-ав*   *к/к*   *мам-є*
     kozenjatko   *po-bjež-av*   *k/k*   *mam-je*
     baby goat   PFV-run-PST.M.SG   to   mother-DAT.F.SG

     'The baby goat ran to its mother.'   (12CHIBGUKR)

In (3), we may infer that the baby goat feels safe as it immediately returns to its mother. However, since the internal state is not explicitly verbalized, we cannot assign a score for this.

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[3] The interpretation of the participants' codes: Participant number: 0–25; Participant group: CHI for child; Story: C for Cat, D for Dog, BB for Baby Birds, BG for Baby Goats; Language of elicitation: RUS for Russian, UKR for Ukrainian.

[4] The examples feature the original language forms used by the participants of the study, which have not been normalized to conform to Standard Ukrainian or Russian.

4.3.2 Differentiating Attempts and Outcomes

When analyzing the components of macrostructure, a common challenge involved differentiating between attempts and outcomes. Grammatical aspect can be particularly helpful in this regard. In Ukrainian and Russian, like in many Slavic languages, nearly every verb belongs to an aspectual pair: imperfective and perfective. The imperfective aspect expresses general, ongoing, or repetitive actions, while the perfective aspect denotes actions that are completed, one-time occurrences, or otherwise limited in scope (Press & Pugh, 1999; Grønn 2015; Borik, 2018). For instance, consider the example from the *Dog* story shown in (4).

(4) | *Коли* | *хазяїн* | *доста-ва-в* | | *шарик,* | | *то* |
| *Koly* | *chazjajin* | *dosta-va-v* | | *šaryk,* | | *to* |
| when | owner.NOM.M.SG | get.out-IPFV-PST.M.SG | | balloon.ACC.M.SG | | then |

пес-ик		*уже*	*пачті*	*доста-в*		*свою*
pes-yk		*uže*	*pačti*	*dosta-v*		*svoju*
dog-DIM.NOM.M.SG		already	almost	get.out-PFV.PST.M.SG		POSS.F.ACC

їжу.	*I*	*коли*	*хазяїн*		*доста-в*	
jižu.	*I*	*koly*	*chazjajin*		*dosta-v*	
food.ACC.F.SG	and	when	owner.NOM.M.SG		get.out-PFV.PST.M.SG	

шарик,	*він*	*вже*	*все*	*з'ї-в.*	
šaryk,	*vin*	*vže*	*vse*	*z'ji-v.*	
balloon.ACC.M.SG	he	already	all.ACC.N.SG	eat-PST.PFV.M.SG	

'When the owner was getting out the balloon, the little dog had already almost taken out his food. And when the owner got out the balloon, he had already eaten everything.' (04CHIDUKR)

In (4), the action of getting something out is initially expressed using the imperfective form *dostavav* 'he was getting (something) out', emphasizing the unfinished nature of the action. According to the Russian version of the MAIN guidelines (Dog, A9), this instance should be annotated as an attempt. Immediately afterward, the child uses the perfective form *dostav* 'he got (something) out', which marks the completion of the action. Following the Russian guidelines (Dog, A10), this instance is annotated as an outcome. Although both forms stem from the same lexical verb, the distinction between imperfective and perfective aspects leads to their classification as attempt and outcome, respectively.

In contrast, English does not express aspect morphologically as Slavic languages do. Instead, aspectual distinctions are primarily encoded grammatically through *periphrastic constructions* with auxiliaries. In the corresponding English version of the MAIN, these aspectual nuances are often conveyed not only through such constructions, but also through *lexical choices*. For example, where Russian uses a single verb with aspectual variation (*dostavav* vs. *dostav*) for attempt and outcome, English may employ different lexical verbs altogether (e.g., *was trying to pull out* vs. *got*), which results in a *lexical rather than morphological realization* of aspectual contrast.

The Russian version of the MAIN guidelines documents several instances where annotation differences are based on aspect. However, it is not always clear whether verbs in the

imperfective aspect should be annotated as an attempt or an outcome. Consider (5) from our data.

(5)

A	*в*	*то*	*время*	*кот*	*или*	*кошка*	*взя-л*
A	*v*	*to*	*vremja*	*kot*	*ili*	*koška*	*vzja-l*
and	in	that	time	cat.NOM.M.SG	or	cat.NOM.F.SG	take-PST.M.SG

или	*взя-л-а*	*рыб-у.*	*И*	*она*	*в*	*то*	*время*	*или*	*он*
ili	*vzia-l-a*	*ryb-u.*	*I*	*ona*	*v*	*to*	*vremja*	*ili*	*on*
or	take-PST.F.SG	fish-ACC.F.SG	And	she	in	that	time	or	he

е-л	*её*	*или*	*е-л-а.*
e-l	*ejo*	*ili*	*e-l-a.*
eat-PST.M.SG	it.ACC.F.SG	or	eat-PST-F.SG

'And at that time, the cat (male) or the cat (female) took the fish. And she or he was eating it at that time.' (13CHICRUS)

In (5), the action of eating is expressed with the help of the imperfective form *el/ela* '(he/she) was eating'. Even though the cat was eating the fish, the imperfective aspect highlights the unfinished action. Also, the verb *to begin* in such cases could signal an action that is initiated but remains unfinished, i.e., *она начала есть рыбу (ona načala est' rybu)* 'she began to eat the fish'. In Russian, the perfective form of the verb 'to eat' is *съесть (s"est')* 'to eat up' (i.e., *он съел рыбу (on s"el rybu)* 'he ate the fish') which would mark a completed action. Alternatively, the outcome could be expressed semantically with structures like *было пусто (bylo pusto)* 'was empty', *рыбы не осталось (ryby ne ostalos')* 'no fish left'. Therefore, such instances like in (5) were annotated as an attempt and not an outcome. It is important to note that the rule is not straightforward, as the semantic meaning must also be considered. For instance, the Ukrainian verb *спробувала (sprobuvala)* or the Russian verb *попыталась (popytalas')* 'tried' indicates an attempt, despite being in the perfective form.

Another challenge was interpreting ingressive verbs – perfective verbs that encode the beginning of an event but, unlike telic perfective verbs, do not express its result (Stoll, 2005) – when children used them in contexts where telic perfective verbs would typically be expected. For instance, verbs with the prefix *po-,* such as the Ukrainian verb *побігти (pobihty)* 'to start running' (6) are perfective, yet they do not confirm the final outcome; rather, due to the prefix *po-*, they indicate that the action was initiated or directed toward an endpoint (for a discussion, see Gagarina, 2004; Kalko, 2013; Stoll, 2005). Stoll (2005) argues that the telic *Aktionsart* is the most frequent and context independent *Aktionsart*, i.e. it occurs in all communicative contexts. Consequently, it is acquired by children earlier than the more context-sensitive ingressive *Aktionsart*. Thus, these findings lead us to interpret these cases as outcome*s*, provided that the lexical verbs were used in accordance with the protocol.

(6)

a	*потім*	*кіт [...]*	*по-біг,*	*А*	*собака*	*за*
a	*potim*	*kit [...]*	*po-bih,*	*A*	*sobaka*	*za*
and	then	cat.NOM.M.SG	PFV-run.PST.M.SG	And	dog.NOM.M.SG	after

ним   по-біг-л-а
nym   po-bih-l-a
he.INS   PFV-run-PST-F.SG

'And then the cat [...] ran, and the dog ran after him.'   (01CHIBBUKR)

4.3.3 Differentiating Goals and Attempts

Some examples were challenging when differentiating between goals and attempts. Consider the two examples below.

(7)   *Довго   думаючи,   малий   поліз   на   дерево   за*
      Dovho   duma-juču,   malyj   po-liz   na   derevo   za
      long   think-CVB   boy   PFV-climb.PST.M.SG   on   tree   after

      ці-єю   кульк-аю
      ci-jeju   kul'k-aju
      this-INS   balloon-INS.F.SG

      'Thinking for a long time, the boy climbed up the tree after this balloon.'
                                                                           (12ADUDUKR)

(8)   *I   поки   хлопчик   діст-авав   т-ого*
      I   poky   chlopčyk   dist-avav   t-oho
      And   while boy.NOM.M.SG   take.out-PST.M.SG   that-GEN.SG.M

      м'яч-а,   дум-ав,   як   же   його   діст-ати…
      m'jač-a,   dum-av,   jak   že   joho   dist-aty…
      ball-GEN.SG.M think-PST.M.SG. how   Q   it.ACC.SG.M   take.out-INF

      'And while the boy was pulling the ball, he was thinking how to get it...'
                                                                           (02ADUCUKR)

In these examples, constructions that involve the verb 'to think' – such as *довго думаючи (dovho dumajuču)* 'thinking for a long time' in (7) and *думав, як же його дістати (dumav, jak že joho distaty)* 'was thinking how to get it' in (8) – can be regarded as goals or parts of complex attempts. What is crucial here is the order in which these actions occur. Thus, in (7), the boy was thinking about performing the action, and this thought process is directly followed by an attempt. Therefore, we classified *довго думаючи (dovho dumajuču)* 'thinking for a long time' as a goal (Dog, A8). On the other hand, in (8), the boy was also thinking about how to get the ball. However, since this thinking is preceded by the attempt *хлопчик діставав того м'яча (chlopčyk distavav toho m'jača)* 'the boy was pulling the ball', it indicates that he had already decided to act beforehand. Therefore, it is not annotated as a goal and is part of a complex attempt.

4.3.4 Flexibility in scoring incomplete responses

Children's narratives can often be fragmented, i.e., with omissions of objects or descriptive elements. In such cases, evaluators might still assign a score if the essential meaning of responses aligns with the MAIN scoring protocol, suggesting a lenient approach, particularly

when assessing younger children.

(9)   *Но*   *собака*   *поміти-л-а*   *та*   *кусну-л-а*   *єго*   *за*
           No   *sobaka*   *pomity-l-a*   *ta*   *kusnu-l-a*   *jeho*   *za*
           but   dog.NOM.M.SG   notice-PST-F.SG   and   bite-PST.F.SG   him   for

           хвіст
           chvist
           tail.ACC. M.SG
           'But the dog noticed and bit him on the tail.'   (01CHIBBUKR)

In (9), the verb *pomitila* 'noticed' lacks an explicit object, leaving it unclear what exactly the dog saw. According to the MAIN protocol, the expected object would indicate that the bird was in danger or that the cat caught/got the bird. However, if the broader scene of the event has been established earlier in the narrative, one point can still be assigned for an IST as an initiating event (BB, A12). In this example, the child elaborated on the scene: *Коли пт/ кіт поліз на пташенят, коли мама принесла їду/ їжу, та він схопив одново із птенчоков (Koly pt/ kit poliz na ptašenjat, koly mama prynesla jidu/ jižu, ta vin schopyv odnovo iz ptenčokov)* 'When the cat climbed after the baby birds, when the mother brought food, he grabbed one of the baby birds'. Therefore, we assigned a point in this instance.

4.3.5 Self-Repairs

The last challenging point was how to deal with self-repairs, especially when children self-corrected their responses by modifying a whole story component or even several components. For instance, if a child says, 'The cat caught the bird... no, the cat tried to catch the bird', this adjustment reflects the child's recognition of an attempt rather than a result. Self-corrections should be marked in transcripts, with evaluators considering the last version of what the child said, as it is the most accurate representation of the child's intended meaning.

By addressing these instances, we aim to highlight challenging cases in the scoring guidelines to better capture the developmental nuances in children's narrative production. We believe that many of these challenges are language-independent and can be effectively incorporated into the manual.

5   Narrative skills in bilinguals' languages

Next, we turn to the second aim of the paper, which is to contribute to the ongoing research on story structure and story complexity in children's both languages, by providing evidence from Ukrainian-Russian bilingual children.

There is evidence that macrostructure is universally acquired across languages, including by bilingual children in both their first and second languages (e.g., Gutiérrez-Clellen et al., 2008; Iluz-Cohen & Walters, 2012; Pearson, 2001; Uccelli & Páez, 2007, as cited in Gagarina, 2016). However, Gagarina (2016) indicates that narrative skills, such as story structure, story complexity, and the use of internal state terms (ISTs), follow different developmental paths, pointing to a more nuanced differentiation within these macrostructure measures.

For instance, while most studies on story structure conclude that bilingual children perform similarly in both languages (Altman et al., 2016; Bohnacker, 2016; Bohnacker et al., 2022; Fiani et al., 2022; Fichman et al., 2022; Kunnari et al., 2016; Rodina, 2017, as summarized in the review by Lindgren et al., 2023), some research have found differences between the two. For example, several studies on story structure in sequential bilinguals have found that children score higher on story structure in their L1 than in their L2 (Kapalková et al., 2016; Roch et al., 2016; Tribushinina et al., 2022). According to Lindgren et al. (2023), these differences are likely due to children's lower proficiency in their L2. For simultaneous bilinguals, studies by Lindgren (2018) and Lindgren & Bohnacker (2022) show higher scores in the societal language compared to the home language, which Lindgren et al. (2023) again attribute to the children's greater proficiency in the societal language.

Regarding story complexity, studies have found that children produce stories of similar complexity in both languages (Bohnacker et al., 2022; Fiestas & Peña, 2004; Gagarina, 2016; Kunnari et al., 2016; Lindgren, 2018). Studies showed that certain factors play a significant role in the development of narrative skills in children. Thus, for example, Gagarina (2016) argues that narrative complexity is sensitive to formal education, meaning that if it is taught in one language, it may not transfer immediately to the other language. Furthermore, Haman et al. (2017) showed that language input and exposure have influence on the narrative development in children, specifically for story structure, although other studies did not find such an effect (Bohnacker et al., 2022; Lindgren & Bohnacker, 2022; Tribushinina et al., 2022). With regard to the effect of language dominance, no effect of language dominance has been reported on the development of narrative skills (Fiani et al., 2022; Fichman et al., 2022). Hence, Lindgren et al. (2023) summarize that factors such as input, length of exposure, age of onset and language dominance need to be investigated further in future studies.

6 Objectives of the study

Building on the findings of previous studies, our research has the following objectives: Using data from Ukrainian-Russian bilingual children, we aim to assess whether these children demonstrate similar performance on two macrostructural measures – story structure and story complexity – across both languages, Ukrainian and Russian. Furthermore, we take language dominance into account and categorize the languages as dominant and weaker. This distinction is grounded in the observation, as explained in Section 3, that children's exposure to Ukrainian and Russian varies depending on their region of residence in Ukraine. Hence, some are primarily exposed to Ukrainian both at home and in the broader society, leading to their dominance in Ukrainian, while others receive substantial input in Russian and may therefore be dominant in Russian.

Drawing on the findings of most previous research, we anticipate that children will perform similarly in both Ukrainian and Russian regarding story structure and story complexity. However, given that the impact of language dominance has not been thoroughly examined, we may observe higher scores in the dominant language for both story structure and story complexity.

7 Methodology

7.1 Participants

To validate the Ukrainian version of the MAIN, we collected data from 25 children,[5] eliciting data in both Ukrainian and Russian to accurately capture the linguistic experiences of the participants. As outlined in Section 3, the linguistic landscape in Ukraine is complex, with Russian being widely spoken across various regions. In many of these areas, Russian is the language used at home, while Ukrainian serves as the primary language of instruction in educational settings and official contexts. Even in the western regions of Ukraine, where Ukrainian is commonly spoken both at home and in the society, historical factors — such as the Soviet era, during which Russian was a compulsory subject in schools — have contributed to an enduring proficiency in Russian among the population (Masenko, 2005; Bilaniuk & Melnyk, 2008; Sokolova, 2022). Although Russian is no longer mandatory in schools, many children in Ukraine continue to encounter the language through social networks and media, enabling them to communicate in Russian to varying extents.

Data were collected between August and September 2022, with all participants arriving in Germany after the onset of the full-scale war in Ukraine in February 2022. Hence, at the time of testing, participants had been living in Germany for a maximum of six months. The children were recruited from the Berlin area through personal connections and advertisements on social networks. Ethical approval for data collection was obtained through the German Linguistic Society (*Deutsche Gesellschaft für Sprachwissenschaft*, *DGfS*), and informed consent was secured from the children's legal guardians prior to their participation in the study.
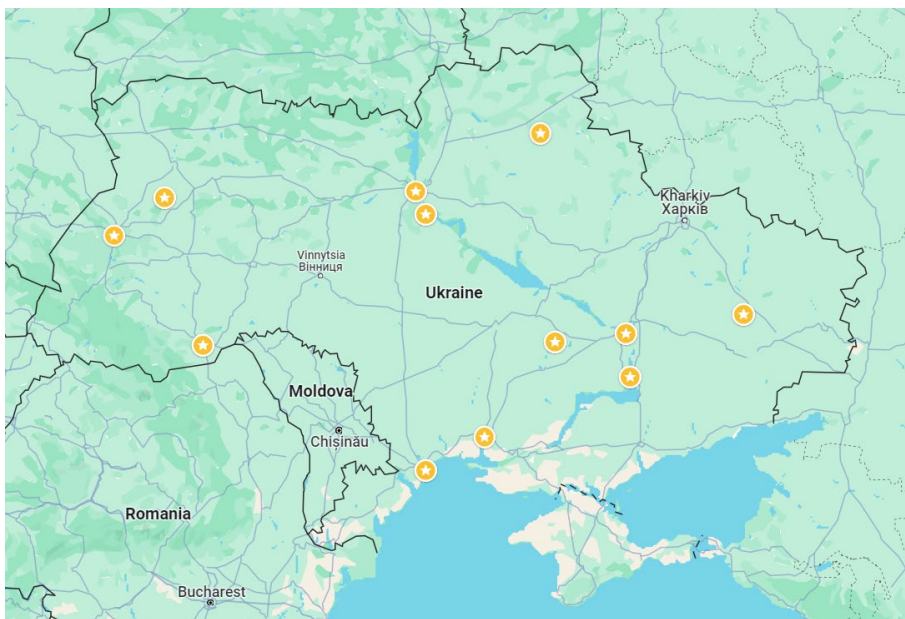

Figure 4. Children's place of residence in Ukraine before relocation to Germany, indicated with stars.

The current study focuses on the results from 18 typically-developing Ukrainian-Russian bilingual children, comprising 11 females and seven males, aged six to nine years (mean age =

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[5] Data were also collected from 21 adults, 20 of whom were mothers of the children and one was a grandmother; however, these are not included in the analysis in this study.

7;7). Prior to their relocation, the children lived with their families in various regions of Ukraine, as shown in Figure 4. Consequently, the amount of input and exposure to Ukrainian and Russian, as well as their dominance in these languages, varied. Based on the calculation of input and exposure, described in Section 7.2.1 below, 11 out of the 18 children in our study were identified as Russian-dominant, whereas seven were Ukrainian-dominant.

7.2   Materials and procedure

Narratives were elicited using the LITMUS-MAIN instrument to assess bilingual children's narrative abilities (Gagarina et al., 2019). Children were asked to narrate a story based on picture stimuli, followed by ten comprehension questions. All four stories— *Dog*, *Cat*, *Baby Birds*, and *Baby Goats*—were administered, with two stories presented in each language. The children were tested in both Ukrainian and Russian during sessions conducted on the same day. Each language session was led by a different investigator, both of whom were native speakers of Ukrainian and Russian, and each language was tested in a separate room. The stories and the order of the languages were counterbalanced. More information on the procedure, including the warm-up questions before the elicitation, picture stories, as well as the comprehension questions can be found in Gagarina et al. (2019).

During the elicitation of the children's narratives, their parents were asked to complete a questionnaire designed to gather comprehensive background information. The questionnaire used in this study was an adapted version of the LITMUS Parental Bilingual Questionnaire (PABIQ) (Tuller, 2015). In addition to information about the child, the questionnaire included a section with questions about the parents' information, such as place of birth, educational qualification, and language practices.

7.3   Transcription, coding and analyses

After data collection, the recordings were cut using Audacity (Audacity Team, 2023) and automatically transcribed with Whisper from OpenAI (see Radford et al., 2023). For this purpose, Whisper was installed locally, and after testing various models, the large model was selected due to its higher transcription accuracy. Despite its generally high accuracy, Whisper tended to normalize the data, for instance by omitting hesitation markers and self-repairs. Additionally, it often translated code-switched or mixed segments into the primary language of narration and occasionally produced hallucinations. Therefore, each transcription was manually reviewed and corrected by native speakers of Ukrainian and Russian.

7.3.1   Scoring of narrative macrostructure

The annotation of macrostructure measures was completed manually using the MAIN scoring guidelines (Gagarina et al., 2019). Two measures of macrostructure were analyzed: story structure and story complexity. The story structure measure had a maximum score of 17 points. Each picture set depicted a story with three episodes, and for each episode, points were allocated for the inclusion of goals, attempts, outcomes, and internal state terms (ISTs) used as either initiating events or reactions (one point per component), totaling up to 15 points across the three

episodes. Additionally, if the setting was mentioned at the beginning of the story, a maximum of two points could be awarded—one for place and one for time.

The second measure—story complexity—focuses on goals (G), attempts (A), and outcomes (O) and is based on Westby's (2005) binary tree model. However, there are different methods for calculating it. For instance, Bohnacker (2016) distinguished between two categories: complete GAO episode and no GAO. Other approaches, like those used by Gagarina (2016) and Yang et al. (2023), assigned zero points if no elements were realized, one point if only A or O (or both) were present, two points if G was realized alone or in combination with A or O, and three points for a full GAO sequence. Furthermore, Tribushinina et al. (2022) used a different approach, assigning zero points for A or O, but one point for G, arguing that goals develop later and are more complex than attempts or outcomes (see Bohnacker, 2016; Trabasso & Nickels, 1992). Combinations of two elements, regardless of whether they included G, received two points, and three points were awarded for the complete GAO sequence. Finally, a fourth method (Gagarina et al., in prep.) is similar to Tribushinina et al.'s (2022) but assigns two points for an AO combination, three points for combinations that include G (GA or GO), and five points for a full GAO sequence, giving more weight to the complete episode. In the present study, we followed the latest method (Gagarina et al., in prep.).

Furthermore, one of the challenges in analyzing the data was the presence of *Suržyk*, a fused lect that blends elements of both Ukrainian and Russian (Del Gaudio, 2010; Hentschel & Taranenko, 2021; Hentschel & Palinska 2022). One child narrated the stories in *Suržyk*, which made it difficult to classify those productions as the ones in Ukrainian or in Russian. The productions of this child were not included in the current study.

7.3.2   *Calculation of language dominance*

Language dominance was calculated using an input/exposure index derived from the PABIQ questionnaire. Following the approach of Mieszkowska et al. (2017) and Abbot-Smith et al. (2018), the input was divided into two categories: at-home input and outside-of-home input.

At-home input included language use by mother, father, younger and older siblings, grandparents, as well as the interaction between the parents. For each source of input, parents rated how frequently each language was used toward the child on a scale from 0 to 4 (0 = never, 1 = rarely, 2 = sometimes, 3 = usually, 4 = always). Input from parents and siblings was given twice the weight of input from other sources. The rationale behind this is that children spend more time with their immediate family (Mieszkowska et al., 2017). Thus, each child could receive up to 4 points per language from each immediate family member (mother, father, and younger or older siblings), resulting in a maximum total of 32 points. Input from grandparents and parental interactions (mother-to-father and father-to-mother) could contribute a maximum of 4 points each, totaling 12 points. Important to note is a child's score increased if more members of the household spoke a given language to them, whereas it decreased in situations such as having no siblings.

Outside-of-home input was calculated based on the child's interactions with friends (rated on a scale of 0 to 4), and engagement in various activities such as reading, watching TV/movies, storytelling, listening to music, podcasts, audiobooks, and writing, all rated on a

scale of 0 to 2 (0 = never, 1 = at least once a week, 2 = every day), totaling 14 points for these external activities. The language predominantly spoken in the region where the child lived before moving to Germany was assigned 8 points, and the language used at the child's school or kindergarten in Ukraine received a weight of 12 points. Thus, the outside-of-home input for each language could reach a maximum of 34 points.

To determine the proportion of input for each language, the scores for at-home and outside-of-home input were combined, and the total was expressed as a percentage, with the two languages together equaling 100%. Children were then categorized as either Ukrainian-dominant or Russian-dominant, using 50% as the threshold for dominance. The results were then compared to parents' responses about which language the child felt more comfortable using: Russian or Ukrainian. Our analysis of language dominance aligned with the parents' answers, showing consistent results across both measures.

7.3.3 Statistical analyses

The statistical analyses were conducted in R (R Core Team, 2024). Data manipulation and visualization were performed using the *tidyverse* package (Wickham, Hadley et al., 2023), and linear mixed-effects regression models were run using the lmer-function of the *lme4* package (Bates et al., 2015).

8   Results

8.1   Story structure

In this section, we present the findings from our analysis of story structure and story complexity. For both measures, we start by describing the quantitative results, reporting outcomes separately for the children's two languages: Ukrainian and Russian. Furthermore, as the children in this study come from various regions in Ukraine, they are dominant in either Ukrainian or Russian. Therefore, it is important to analyze the languages based on their dominance, classifying them as either dominant or weaker.

Figure 5 below displays the results for the story structure score on the *y*-axis and the languages on the *x*-axis. The line inside each box shows the median, while the larger red dots indicate the mean score. Additionally, each smaller dot reflects the score each child received for each story, resulting in two dots per child for each language. Visually, the figure shows that the children score nearly similarly in Ukrainian (M = 7.68, SD = 1.66) and Russian (M = 7.32, SD = 2.21). Furthermore, variation is slightly greater in Russian than in Ukrainian, with scores ranging from 1 to 12.

To check the reliability of the descriptive results, we performed a linear mixed-effects model analysis. The dependent variable was the Story Structure Score, a discrete numeric variable, while the independent variable (fixed effect) was Language, treated as a binary variable (Russian vs. Ukrainian). We also included Participant, represented by the code assigned to each child, and Story (e.g., Baby Birds, Baby Goats, etc.) as random effects in the model to account for individual variability in the data. The analysis results are presented in Table 1.
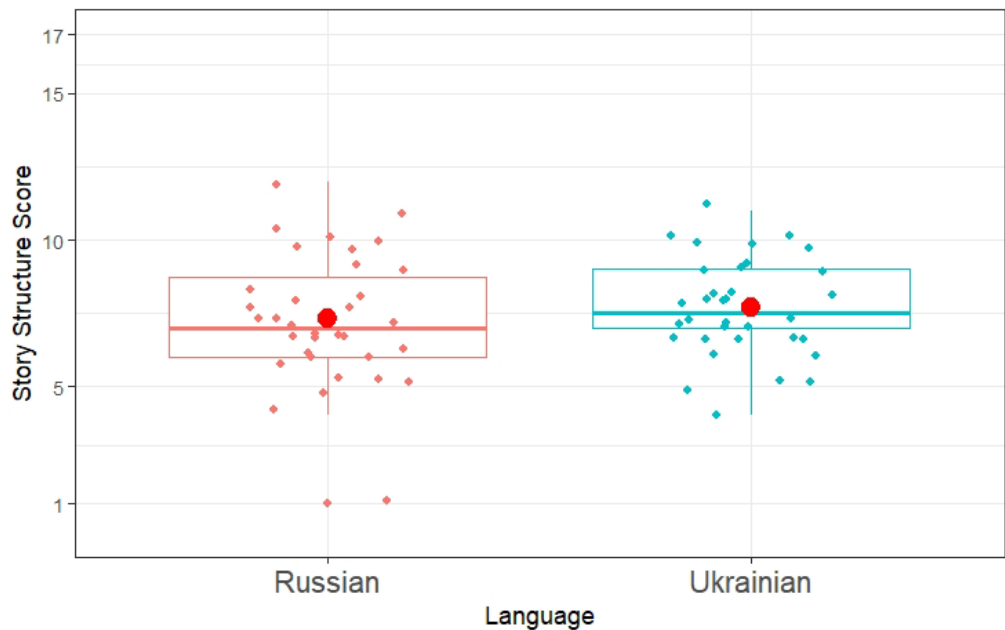
Figure 5. Story structure across the children's both languages.

Table 1. Results of the linear mixed effects model for story structure in Ukrainian and Russian (random and fixed effects)

Random effects	Variance	SD			
Participant	1.50	1.22			
Story	0.56	0.74			
Residual	1.93	1.39			
Fixed effects	***ß***	***SE***	***df***	***t***	***p***
Intercept	7.32	0.53	7.92	13.67	< .001***
Language (Ukrainian)	0.35	0.34	47.49	1.03	.30

Note. *** = p < .001; SD = standard deviation; SE = standard error; df = degrees of freedom.

The results of the model showed that the story structure scores were not significantly influenced by language (Ukrainian vs. Russian) ($ß(\sigma) = 0.35$ (0.34), $p = .30$). Random effects for the model revealed variability among participants and stories, with variances of 1.50 (SD = 1.22) and 0.56 (SD = 0.74), respectively. These findings suggest that story structure scores for Ukrainian-Russian bilingual children do not differ significantly between the two languages, although there is variability attributable to individual differences among participants and the specific stories used in the analysis.

Next, we classified the languages based on dominance to determine whether story structure scores differed between the children's dominant and weaker languages. The results are presented in Figure 6. The languages are categorized not by the languages themselves but by dominance. As indicated in Section 7.1, 11 out of the 18 children were identified as Russian-dominant, while seven were identified as Ukrainian-dominant. Similar to the figure above, the line within each box shows the median, while the larger red dots indicate the mean score. Besides, each smaller dot shows the score each child received for each story, resulting in two dots per child per language. Visually, there is considerable individual variation, with scores ranging from a low of 1 point to a high of 12. However, the mean scores indicate that there is

no difference in the children's performance between their dominant language (M = 7.68, SD = 1.82) and their weaker language (M = 7.32, SD = 2.08).
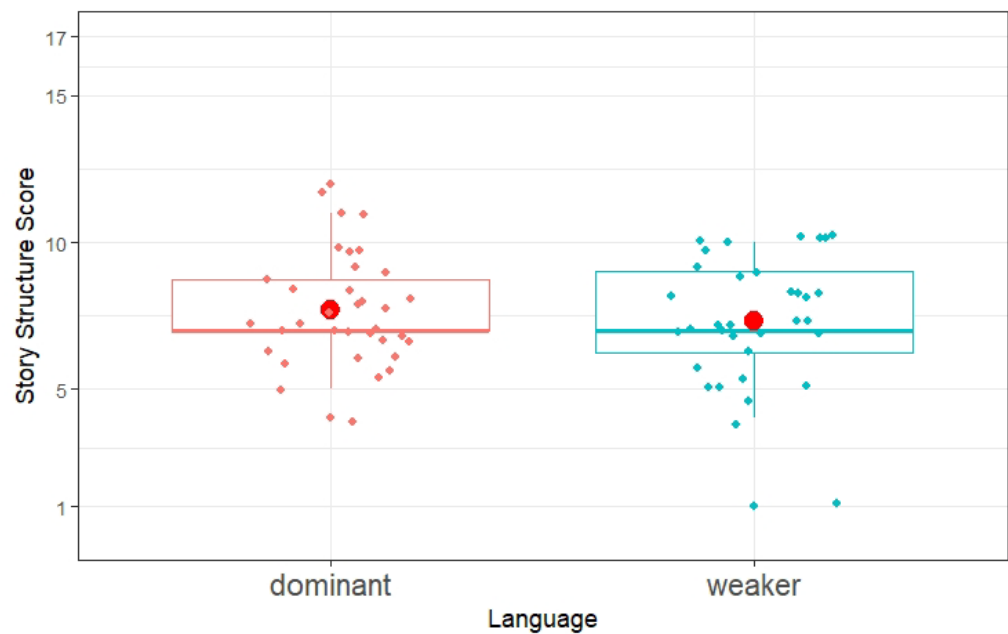

Figure 6. Story structure across the children's both languages, based on language dominance.

To verify the reliability of our descriptive statistics, we conducted a linear mixed-effects model analysis. The dependent variable was the story structure score, a discrete numeric variable, while the independent variable (fixed effect) was Language, represented as a binary variable (dominant vs. weaker). Additionally, Participant, represented by the code assigned to each child, and Story (e.g., Baby Birds, Baby Goats, etc.) were added as random effects to the model to account for individual variation within the data. The results of the analysis can be found in Table 2.

Table 2. Results of the linear mixed effects model for Story Structure, based on language dominance (random and fixed effects)

Random effects	Variance	SD			
Participant	1.50	1.22			
Story	0.54	0.73			
Residual	1.95	1.39			
Fixed effects	*β*	*SE*	*df*	*t*	*p*
Intercept	7.64	0.53	8.03	14.35	< .001***
Language (Weaker)	-0.29	0.34	47.73	-086	.39

Note. *** = p < .001; SD = standard deviation; SE = standard error; df = degrees of freedom.

The model revealed that the effect of language dominance on scores was not statistically significant ($β$ ($σ$) = -0.29 (0.34), p = .39). This suggests that the scores in children's weaker language were not significantly different from those in their dominant language. The random effects showed variability across the groups, with the variable Participant contributing a variance of 1.50 (SD = 1.22) and Story contributing a variance of 0.54 (SD = 0.73). Overall, these findings suggest that while there is considerable variability in story structure scores

among individual children, with less variability across different stories, their language dominance does not significantly influence performance on the story structure measure.

8.2 Story complexity

We now turn to the results of the story complexity analysis. As with the previous findings, we first present the results by language, classifying them into Russian and Ukrainian, followed by an analysis based on language dominance, categorizing the languages as dominant and weaker.

Figure 7 displays the story complexity scores, with the y-axis representing the scores and the x-axis indicating the languages. The figure indicates that, based on the means (represented by the larger red dot), the children perform similarly in terms of story complexity in both Russian M = 5.47, SD = 2.67) and Ukrainian (M = 5.62, SD = 2.17). Additionally, as with the previous analyses, the data reveal considerable individual variation across both languages.
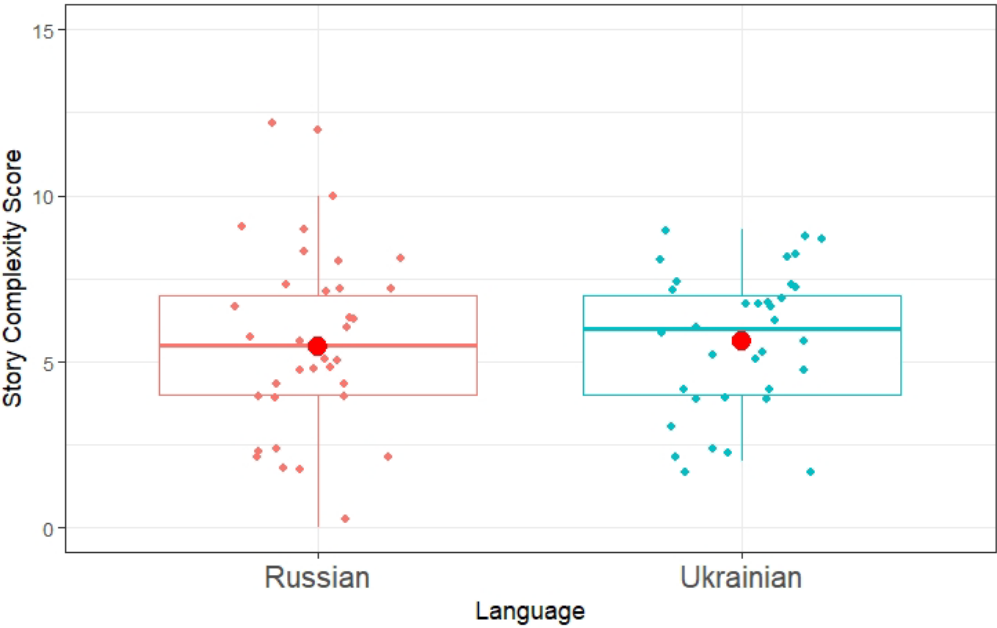

Figure 7. Story complexity across the children's both languages.

As the next step, we ran a liner mixed-effects regression model, with the dependent variable Story Complexity Score, a discrete numeric measure, while the independent variable (fixed effect) was Language, coded as a binary variable (Russian vs. Ukrainian). Participant, represented by the code assigned to each child, and Story were included as random effects to account for individual variability within the dataset. The results of the analysis are presented in Table 3. The results of the analysis indicated that language did not significantly influence the story complexity scores (β (σ) = 0.14 (0.51), p = .77). The random effects revealed variability among participants and stories, with variances of 1.27 (SD=1.12) and 0.28 (SD=0.53), respectively. Overall, these findings suggest that the children's story complexity scores do not differ significantly between Ukrainian and Russian, despite some individual variability in the data.

Table 3. Results of the linear mixed effects model for story complexity in Russian and Ukrainian (random and fixed effects)

Random effects	Variance	SD			
Participant	1.27	1.12			
Story	0.28	0.53			
Residual	4.53	2.12			
Fixed effects	*β*	*SE*	*df*	*t*	*p*
Intercept	5.47	0.59	2.74	9.25	.003**
Language (Ukrainian)	0.14	0.51	49.00	0.28	.77

Note. ** = p < .01; SD = standard deviation; SE = standard error; df = degrees of freedom.

Next, we present the results of the story complexity scores based on language dominance. Figure 8 illustrates these findings, with the y-axis showing the scores and the x-axis displaying the languages categorized by dominance. The line within each box represents the median, while larger red dots show the mean scores. Additionally, each smaller dot marks the individual score each child received for each story, resulting in two dots per child per language. Visually, there is substantial individual variation, with scores ranging from 2 to 12. The mean scores indicate that the children's performance in their dominant language (M = 5.97, SD = 2.49) is slightly better than in their weaker language (M = 5.12, SD = 2.29).
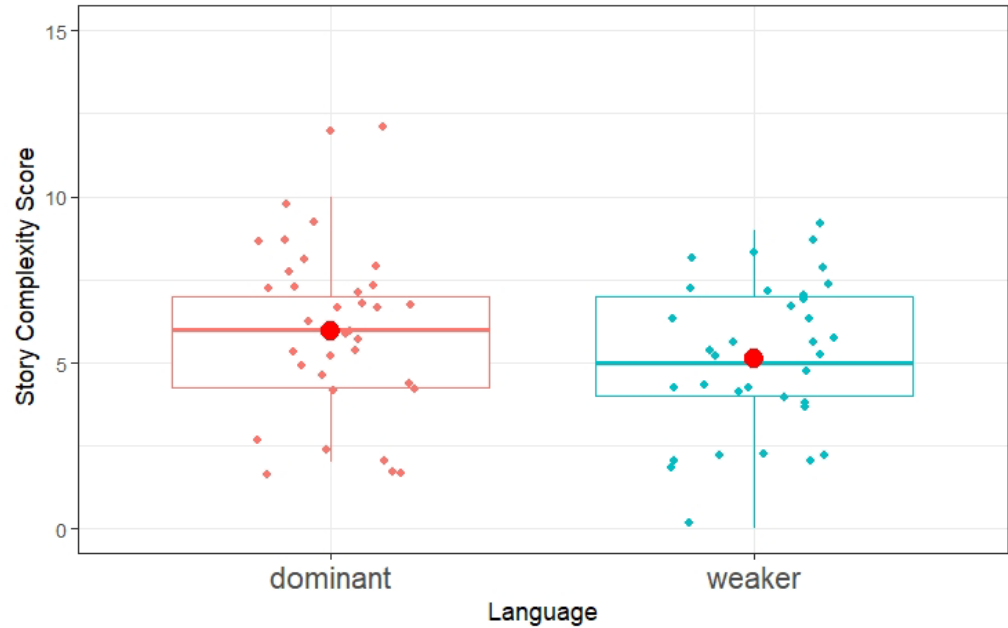

Figure 8. Story complexity across the children's languages, based on language dominance.

To assess the reliability of our descriptive statistics, we performed a linear mixed-effects model analysis. The dependent variable was story complexity score, a discrete numeric measure, while the independent variable (fixed effect) was Language, coded as a binary variable (dominant vs. weaker). Participant, represented by the code assigned to each child, and Story were included as random effects to account for individual variability within the dataset. The results of the analysis can be found in Table 4.

Table 4. Results of the linear mixed effects model for Story Complexity (random and fixed effects).

Random effects	Variance	SD			
Participant	1.34	1.16			
Story	0.29	0.54			
Residual	4.29	2.07			
Fixed effects	*ß*	*SE*	*df*	*t*	*p*
Intercept	5.97	0.59	2.74	10.10	.002**
Language (Ukrainian)	-0.85	0.50	49.00	-1.69	.09

Note. ** = p < .01; SD = standard deviation; SE = standard error; df = degrees of freedom.

The model indicated that language dominance did not have a significant effect on the children's story complexity scores ($ß$ (σ)= -0.85 (0.50), *p* = .09). This implies that the complexity scores in children's weaker language were not significantly different from those in their dominant language. The random effects revealed variability within the groups, with the Participant contributing a variance of 1.34 (SD = 1.16) and Story contributing a variance of 0.29 (SD = 0.54), meaning that variability is more pronounced at the individual level than across different stories. These results suggest that, while there is notable individual variability in story complexity scores, the influence of language dominance on story complexity is not statistically significant.

9 Discussion and conclusion

The present paper had two main objectives. The first was to highlight some challenging and ambiguous yet systematically occurring cases in the scoring protocols during the adaptation of MAIN. Key challenges include capturing internal state terms (ISTs), particularly when pragmatic interpretations deviate from the standard protocol, as well as clear guidelines for scoring implied reactions. We also propose refined criteria to distinguish between attempts and outcomes by focusing on aspectual cues in verbs, and a closer examination of goals versus attempts, taking into account the sequence in which they occur. Furthermore, we suggest flexibility in scoring incomplete responses, particularly when assessing younger children, and recommend documenting self-repairs to reflect children's final intended narratives. By implementing these adjustments, we aim to enhance the accuracy and sensitivity of the scoring guidelines of the MAIN protocol. Importantly, future research should consider that our scoring, described in Section 4.3, deviates slightly from the standard protocol, and this should be taken into account for valid comparisons.

The second objective was to offer insights into the macrostructural skills of the children across their two languages, specifically focusing on story structure and story complexity. Following the approach used in most previous studies with the MAIN, we started by examining the children's narratives based on language. The analysis revealed no significant effect of language on the scores for story structure or story complexity, indicating that the children performed similarly in both Ukrainian and Russian across these measures. These findings align with the majority of prior research on narrative abilities in children using the MAIN (Altman et al., 2016; Bohnacker, 2016; Bohnacker et al., 2022; Fiani et al., 2022; Fichman et al., 2022; Kunnari et al., 2016; Rodina, 2017, as summarized in the review by Lindgren et al., 2023), and

highlight that narrative skills are acquired universally and can be transferred between languages.

It is important to note that analyzing the data solely based on the specific language used is not entirely accurate in this context. Children in Ukraine, particularly those in preschool and elementary school, are typically bilingual and hence dominant in either Russian or Ukrainian, depending largely on the region they come from. Since the children in our study came from various regions in Ukraine, it is more appropriate to classify the languages as dominant and weaker. Using responses from the parental questionnaire, we categorized the children into two groups: Russian-dominant and Ukrainian-dominant. Of the 18 children, 11 were identified as Russian-dominant, while seven were classified as Ukrainian-dominant. The results for both story structure and story complexity showed no significant differences in performance across the children's languages, irrespective of language dominance. While relatively few studies have explored the impact of language dominance on children's narrative abilities, our findings align with the existing research (Fiani et al., 2022; Fichman et al., 2022).

In sum, the adaptation of the MAIN to Ukrainian is particularly significant given the displacement of millions of Ukrainian children due to the ongoing war. The highlighted challenges in the scoring protocols aim to improve the instrument's accuracy and sensitivity. Additionally, the findings support the broader research consensus that narrative skills are acquired universally and can transfer across languages, as evidenced by the children's similar performance in story structure and story complexity in both Ukrainian and Russian, regardless of the language. Furthermore, the study included the important variable of language dominance, revealing that it does not significantly influence the children's narrative abilities. However, given the considerable individual variation in scores for both macrostructure measures, further research is necessary to explore the potential factors contributing to this variability. Future studies for this language pair should also include larger samples to ensure the findings are more broadly applicable. Additionally, integrating microstructural analyses —such as examining lexical diversity, syntactic complexity, and other linguistic features—would provide deeper insights into the narrative skills of Ukrainian-Russian bilinguals. Finally, testing children across different age groups could reveal developmental differences in their narrative abilities.

Abbreviations

ACC – accusative

CVB – converb

DAT – dative

DIM – dimunitive

F – feminine

GEN – genitive

INF – infinitive

INS – instrumental

IPFV – imperfective

LOC – locative

M – masculine

N – neuter

NOM – nominative

PL – plural

PFV – perfective

POSS – possessive

PST – past

PTCP – participle

REFL – reflexive

SG – singular

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