Ordering preferences in Ukrainian multiple *wh*-fronting

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Abstract. We present the first systematic study of ordering restrictions in Ukrainian multiple *wh*-fronting (MWF) constructions, examining the effects of grammatical relation, case and animacy. Using an acceptability judgment task with pair-list primes, we tested the acceptability of Superiority-obeying and Superiority-violating questions with two *wh*-arguments. We found that Ukrainian speakers exhibit two distinct patterns with respect to Superiority: one group of speakers accepted Superiority violations while the other did not. Both groups, however, allowed free word order with *wh*-prepositional phrases and the lexical item *ščo* 'what'. We conclude that these two patterns represent two distinct varieties of Ukrainian which differ in Superiority in matrix MWF constructions.

Keywords. *wh*-questions; multiple *wh*-fronting; word order; Superiority; Ukrainian; Slavic

1. Introduction. Slavic languages are known for their multiple *wh*-fronting (MWF) constructions, whereby all *wh*-phrases must undergo movement to the front of the clause, exemplified in the contrast between (1a) and (1b) from Serbo-Croatian. Individual languages differ, however, in whether their multiple fronted *wh*-phrases have free or restricted word order in matrix questions (e.g. Rudin 1988, 1996, Billings & Rudin 1996, Cheng 1991, Dornisch 1998, Bošković 1999, 2002, Krapova & Cinque 2008). In Serbo-Croatian, for instance, fronted *wh*-phrases may appear in any order, as shown in (1b) and (1c). In Bulgarian, by contrast, subject *wh*-phrases must precede object *wh*-phrases, as in (2).

(1)   Serbo-Croatian (Bošković 2002: 353)
    a. *Ko   voli   koga?
       who.NOM   loves   who.ACC
    b. Ko   koga   voli?
       who.NOM   who.ACC   loves
    c. Koga   ko   voli?
       who.ACC   who.NOM   loves
       'Who loves whom?'

(2)   Bulgarian (Bošković 2002: 354)
    a. Koj   kogo   običa?
       who.NOM   who.ACC   loves
    b. *Kogo   koj   običa?
       who.ACC   who.NOM   loves
       'Who loves whom?'

The ordering restrictions exhibited by multiple fronted *wh*-phrases in languages like Bulgarian have been attributed to a locality effect known as the Superiority condition, whereby a lower

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constituent cannot undergo *wh*-movement over a higher one (Chomsky 1973). MWF is thus said to exhibit Superiority effects in Bulgarian but not in Serbo-Croatian.

We focus in this paper on Ukrainian. The limited previous work on Ukrainian MWF reports a preference for *wh*-subjects to precede *wh*-objects when both are animate (Rudin 1996, Bashutski 2008), as shown in (3). Like Bulgarian, then, Ukrainian has been claimed to exhibit Superiority effects.

(3)   Ukrainian (Rudin 1996: 117)
        a. Hto   koho   vdaryv?
            who.NOM who.ACC   hit
        b. *Koho   hto   vdaryv?
            who.ACC   who.NOM hit
            'Who hit whom?'

As we will show, however, Ukrainian speakers exhibit inter-speaker variation as to whether they accept or reject Superiority-violating orders such as (3b). Furthermore, it has been observed that sentences with inanimate *wh*-arguments appear to be exempt from Superiority (Rudin 1996, Bashutski 2008). However, no systematic study of ordering preferences in Ukrainian MWF has been previously conducted.

In this study, we investigate the effects of grammatical relation (Superiority), case, and animacy on the ordering of *wh*-phrases in Ukrainian MWF. We report the results of an acceptability judgment task conducted with five native speakers of Ukrainian. Using pair-list primes, we tested the acceptability of Superiority-obeying and Superiority-violating questions with two *wh*-arguments. We found that Ukrainian speakers fall into one of two distinct patterns, one which permits Superiority violations and another which does not. In both patterns, we additionally found that *wh*-prepositional phrases and the lexical item *ščo* 'what' exhibit free word order. We suggest that the two patterns observed with respect to Superiority represent two distinct varieties of Ukrainian.

While the goals of this study are primarily descriptive, we also aim to situate Ukrainian in the wider MWF typology. In section 2, we discuss the role played by Superiority in Slavic MWF typology and in previous work on Ukrainian. In section 3, we present our acceptability judgment task testing the effects of grammatical relation, case, and animacy on ordering preferences in Ukrainian MWF. We find that two distinct patterns emerge with respect to Superiority. We conclude in section 4 that the two patterns observed indicate that Ukrainian varieties fall into two distinct MWF types (Bošković 2002).

2. Multiple *wh*-fronting in Slavic

2.1. MWF TYPOLOGY. Superiority is one of several properties employed by Rudin's (1988, 1996) seminal classification of MWF languages. Examining several properties such as clitic placement and the presence of *wh*-islands in addition to Superiority, Rudin shows that Slavic languages fall into two types with systematic properties, listed in Table 1.[1] While most Slavic languages permit the appearance of clitics after the first *wh*-phrase and exhibit *wh*-islands, for example, Bulgarian and Romanian do not. Rudin accounts for these facts by positing the availability of a Multiply-Filled CP Specifier (MFS) in Bulgarian and Romanian but not in the other languages. Slavic languages and their properties can thus be categorized as being +MFS or −MFS.

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[1] Richards (2001) proposes a similar two-way typology, labeled CP-absorption and IP-absorption languages.

	+MFS (Bulgarian, Romanian)	−MFS (Serbo-Croatian, Polish, Czech, Russian)
Clitics follow first *wh*-phrase	✘	✔
Wh-islands hold	✘	✔
Multiple extraction is permitted	✔	✘
Exhibits Superiority effects	✔	✘

Table 1. Rudin's Slavic multiple *wh*-fronting typology

Interestingly, Rudin (1996) observes that while the other +/−MFS tests fairly straightforwardly diagnose a difference in structure, Superiority is the only property that is based purely on correlation; the +/−MFS nature of a language does not provide a syntactic explanation for whether it exhibits Superiority effects.

Given the potentially orthogonal nature of Superiority with respect to other MWF characteristics and its lack of explanation in previous literature, Bošković (1999, 2002) investigates Superiority in its own right. Examining short-distance (matrix) and long-distance (subordinate clause) MWF constructions, he shows that Serbo-Croatian and Russian—both characterized as −MFS in Rudin's typology—both allow Superiority-violating orders in short-distance questions, but differ in their long-distance questions. Serbo-Croatian in fact obeys Superiority in long-distance questions, whereas in Russian, no Superiority effects are observed in either short-distance or long-distance questions. Bulgarian, meanwhile, exhibits Superiority in both types of questions. His resulting three-way typology is given in Table 2.

Exhibits Superiority effects in:	Type 1 (Bulgarian)	Type 2 (Serbo-Croatian)	Type 3 (Russian)
Short-distance MWF	✔	✘	✘
Long-distance MWF	✔	✔	✘

Table 2. Bošković's Slavic multiple *wh*-fronting typology based on Superiority

Bošković (1999, 2002) explains this typology by appealing to different types of movement involved in *wh*-fronting: *wh*-movement must obey Superiority, while focus movement does not. Thus Bulgarian exhibits *wh*-movement in all questions, Serbo-Croatian has focus movement in short-distance questions but *wh*-movement in long-distance questions, and Russian has focus movement in all questions.

2.2. UKRAINIAN. Where does Ukrainian fit in the proposed MWF typologies? According to Rudin (1996), Ukrainian displays all of the properties of a −MFS language *except* for Superiority (see also Batshuski 2008). Like other −MFS languages, Ukrainian allows clitics after the first *wh*-phrase, exhibits *wh*-islands and disallows multiple extraction from subordinate clauses. Like +MFS languages, however, Ukrainian shows a restricted order of fronted *wh*-phrases, as in the example repeated in (4). Table 3 gives the +/−MFS properties reported by Rudin on Ukrainian.

(4)   Ukrainian (Rudin 1996: 117)
    a. Hto   koho   vdaryv?
       who.NOM who.ACC hit
    b. *Koho   hto   vdaryv?
       who.ACC who.NOM hit
       'Who hit whom?'

	+MFS (Bulgarian, Romanian)	−MFS (Serbo-Croatian, Russian)	Ukrainian
Clitics follow first *wh*-phrase	✗	✓	✓
Wh-islands hold	✗	✓	✓
Multiple extraction is permitted	✓	✗	✗
Exhibits Superiority effects	✓	✗	✓

Table 3. Ukrainian and Rudin's typology

As we will see, Ukrainian speakers in fact exhibit inter-speaker variation in whether they accept Superiority-violating orders such as (4b). Additionally, Rudin (1996) and Batshuski (2008) have shown that inanimate *wh*-arguments, such as in (5), seem to be exempt from Superiority effects in Ukrainian. *Wh*-phrase order in Ukrainian MWF thus turns out be more complicated than Rudin's typology initially suggests; Batshuski (2008) furthermore speaks of ordering *preferences* in the language rather than absolute restrictions.

(5) Ukrainian (Bashutski 2008: 99)
 a. Hto   ščo   kupyv?
     who.NOM   what.ACC bought
 b. Ščo   hto   kupyv?
     what.ACC who.NOM   bought
     'Who bought what?'

The previous work on Ukrainian MWF has been fairly limited, examining only a few construction types without providing details of the methodology used to elicit the data and judgments. We present a more systematic study of ordering preferences in Ukrainian MWF, testing several syntactic factors.

2.3. ORDERING PREFERENCES. It has been observed for other Slavic languages that the ordering of *wh*-phrases in MWF constructions may be sensitive to a number of different factors. Superiority depends on grammatical relation, where subjects, indirect objects and direct objects appear in their base (non-*wh*) order (e.g. Rudin 1996; Dornisch 1998 on Polish). Case has also been noted as an important factor, even in supposedly free order languages like Polish, where nominative arguments are usually ordered first (e.g. Cheng 1991, Dornisch 1998 on Polish; Billings & Rudin 1996 on Bulgarian; Rudin 1996, Bashutski 2008 on Ukrainian). Animate arguments are preferentially ordered first in Bulgarian (Billings & Rudin (1996), while *wh*-prepositional phrases (*wh*-PPs) have been observed to exhibit exceptionally free order with respect to other *wh*-phrases (e.g. Billings & Rudin 1996 on Ukrainian; Krapova & Cinque 2008 on Bulgarian).

3. Multiple *wh*-fronting in Ukrainian. We conducted a study to investigate the effects of grammatical relation (Superiority), case and animacy on ordering preferences in Ukrainian MWF constructions. We tested the following factors:

(6) a. Grammatical relation (Superiority): Subject, Indirect object, Direct object
     b. Case: NOM, ACC, DAT, GEN, *with* INSTR, *for* GEN
     c. Animacy: Animate ('who'), Inanimate ('what')

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We assumed the following base hierarchical order of grammatical relations, from highest to lowest: subject, indirect object and then direct object. The *with* INSTR and *for* GEN conditions involved *wh*-words within PPs.

3.1. METHOD. We designed an acceptability judgment task with 20 target MWF sentences. Each target sentence included three arguments, two of which were *wh*-phrases; the two *wh*-phrases appeared in either Superiority-obeying or Superiority-violating order. It is well-known that questions with multiple *wh*-phrases may allow pair-list (multiple-pair) or single-pair readings cross-linguistically (e.g. Dayal 1996, 2002); this is true of Slavic languages as well (e.g. Bošković 2001, Grebenyova 2004). In order to ensure consistent interpretation across target MWF constructions, each target sentence was preceded by two declarative "prime" sentences which provided a pair-list context. After presentation of the prime sentences, as in (7a), participants were given either a Superiority-obeying (7b) or Superiority-violating MWF target sentence (7c). They were asked to judge the target sentence as 'good', 'bad', or 'maybe' based on the given context. Items were presented in pseudo-randomized order.

(7)   a.   Declarative prime sentences
             Я показала Саші Бейонсе. Я показала Ані Шакіру.
             Ya   pokazala Sashi Beyonce.   Ya   pokazala Ani   Shakiru.
             1SG   showed   S.DAT   B.ACC   1SG   showed   A.DAT S.ACC
             'I showed Sasha Beyonce. I showed Anya Shakira.'

       b.   Superiority-obeying MWF target sentence
             Кому кого я показала?
             Komu   koho   ya   pokazala?
             who.DAT   who.ACC   1SG   showed
             'Who did I show to whom?'

       c.   Superiority-violating MWF target sentence
             Кого кому я показала?
             Koho   komu   ya   pokazala?
             who.ACC   who.DAT   1SG   showed
             'Who did I show to whom?'

Five native speakers of Ukrainian participated in the study. Each participant was a university graduate currently living in Western Ukraine and also spoke Russian and English fluently. The study was conducted online via Zoom by the first author, who presented the items verbally in Ukrainian; participants provided verbal judgments. We considered target sentences judged as 'bad' to be unacceptable and target sentences judged as 'good' or 'maybe' to be acceptable.

3.2. RESULTS. While all participant responses patterned similarly with respect to case and animacy, they exhibited two distinct patterns with respect to grammatical relation; we will call these patterns Ukrainian A (2 participants) and Ukrainian B (3 participants). Ukrainian A participants consistently rejected Superiority-violating target sentences, while Ukrainian B participants consistently accepted them. Example target sentences along with their judgments are given in (8), which involves animate indirect object and direct object *wh*-phrases, and (9), which involves an animate *wh*-subject with an inanimate *wh*-direct object. Ukrainian A thus exhibited a Superiority-based ordering preference, while Ukrainian B did not.

(8)　a.　Superiority-obeying　　　　　　　　　　　(Ukrainian A ✓, Ukrainian B ✓)
　　　　　Кому кого я показала?
　　　　　Komu　　koho　　ya　　pokazala?
　　　　　who.DAT　who.ACC　1SG　showed

　　b.　Superiority-violating　　　　　　　　　　　(Ukrainian A ✗, Ukrainian B ✓)
　　　　　Кого кому я показала?
　　　　　Koho　　komu　　ya　　pokazala?
　　　　　who.ACC　who.DAT　1SG　showed
　　　　　'Who did I show to whom?'

(9)　a.　Superiority-obeying　　　　　　　　　　　(Ukrainian A ✓, Ukrainian B ✓)
　　　　　Хто чого навчав учнів?
　　　　　Hto　　　čoho　　navčav　　učniv?
　　　　　who.NOM　what.GEN　taught　　students.DAT

　　b.　Superiority-violating　　　　　　　　　　　(Ukrainian A ✗, Ukrainian B ✓)
　　　　　Чого хто навчав учнів?
　　　　　Čoho　　hto　　navčav　　učniv?
　　　　　what.GEN　who.NOM　taught　　students.DAT
　　　　　'Who taught what to the students?'

While Ukrainian A and B differ in behavior with respect to grammatical relation, they pattern together with respect to animacy. Our results corroborated previous findings that the inanimate *wh*-phrase *ščo* 'what.NOM/ACC' induces free word order (Rudin 1996, Batshuski 2008).[2] As exemplified by (10), this was true even of Ukrainian A, which, as we just saw, otherwise requires Superiority to be observed. We note that the free order observed with *ščo* appears limited to this particular lexical item, rather than inanimate *wh*-arguments in general; *čoho* 'what.GEN', for instance, was shown in (9) to be subject to Superiority in Ukrainian A.

(10)　a.　Superiority-obeying　　　　　　　　　　　(Ukrainian A ✓, Ukrainian B ✓)
　　　　　Що кого перевело до київського офісу?
　　　　　Ščo　　koho　　perevelo　　do　kyivskoho oficu?
　　　　　what.NOM　who.ACC　transferred　to　Kyiv office.ACC

　　b.　Superiority-violating　　　　　　　　　　　(Ukrainian A ✓, Ukrainian B ✓)
　　　　　Кого що перевело до київського офісу?
　　　　　Koho　　ščo　　perevelo　　do　kyivskoho oficu?
　　　　　who.ACC　what.NOM　transferred　to　Kyiv office.ACC
　　　　　'What transferred who to the Kyiv Office?'

We observed no general ordering preference based on structural case for either group (beyond correlates with Superiority in Ukrainian A). We did find, however, that *wh*-PPs exhibited free word order. Examples with *s kym* 'with who.INSTR' (11) and *dlya čoho* 'for what.GEN' (12) show

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[2] As indicated by its gloss, *ščo* 'what.NOM/ACC' exhibits a nominative-accusative case syncretism. Its free order cannot be explained by syncretism alone, however, since other forms such as *koho* 'who.ACC/GEN', as shown in (8) and (11), are also syncretic for case but were nonetheless found to be subject to Superiority in Ukrainian A.

that can be ordered freely with respect to the *wh*-subject or *wh*-direct object. Again, this was true even of Ukrainian A, which otherwise exhibits Superiority effects.

(11) a. Superiority-obeying   (Ukrainian A ✓, Ukrainian B ✓)
          Хто з ким познайомив сашу?
          Hto   s   kym   poznayomyv   sashu?
          who.NOM with   who.INSTR   introduced   S.ACC

       b. Superiority-violating   (Ukrainian A ✓, Ukrainian B ✓)
          З ким хто познайомив сашу?
          s   kym   hto   poznayomyv   sashu?
          with   who.INSTR   who.NOM   introduced   S.ACC
          'Who introduced Sasha to whom?'

(12) a. Superiority-obeying   (Ukrainian A ✓, Ukrainian B ✓)
          Для чого кого я привела?
          Dlya   čoho   koho   ya   pryvela?
          for   what.GEN   who.ACC   1SG   brought

       b. Superiority-violating   (Ukrainian A ✓, Ukrainian B ✓)
          Кого для чого я привела?
          Koho   dlya   čoho   ya   pryvela?
          who.ACC   for   what.GEN   1SG   brought
          'Who did I bring for what?'

The results of our study are summarized in Table 4. While all Ukrainian speakers allowed free order in MWF sentences with a *wh*-PP or *ščo* 'what', two general patterns emerged with respect to Superiority; all else being equal, one group of speakers (Ukrainian A) exhibited Superiority effects while the other group (Ukrainian B) did not.

	Ukrainian A	Ukrainian B
Free *wh*-PP order	✓	✓
Free *ščo* order	✓	✓
Exhibits Superiority effects	✓	✗

Table 4. Factors governing order preferences in Ukrainian multiple *wh*-fronting

3.3. DISCUSSION. We found that Ukrainian displays inter-speaker variation with respect to Superiority. In Ukrainian B, *wh*-phrases in MWF constructions may appear in more or less any order. In Ukrainian A, by contrast, only Superiority-obeying orders are possible. This result supports Rudin's (1996) suggestion that Superiority effects may be orthogonal to the classification of a language as +/−MFS; the elimination of Superiority as a diagnostic property would thus make Ukrainian a consistently −MFS language.

It should be noted that Ukrainian exhibits object shift in declarative clauses, whereby the direct object can scramble in front of the verb and the indirect object (e.g. Mykhaylyk et al. 2013, Antonyuk 2015, Antonyuk & Mykhaylyk 2022). This scrambling sets the direct object higher in the structure than the indirect object, which may affect locality relations and thus have consequences for Superiority; namely, if object shift feeds locality relations, then the order of *wh*-direct object before *wh*-indirect object would be Superiority-obeying. The availability of object shift could then be posited as a potential explanation for the acceptability of apparent Superiority

violations questions in Ukrainian B, as they would turn out not to be violations after all. However, object shift cannot be a complete explanation for the very free word order displayed by Ukrainian B, as the subject still remains higher than both the direct object and indirect object even after object shift has occurred, and *wh*-direct objects and *wh*-indirect objects can both appear before *wh*-subjects in Ukrainian B. Appealing to object shift would furthermore make it difficult to account for the difference between Ukrainian A and B, as scrambling is presumably equally available in both varieties.

We turn now to the free ordering of *wh*-PPs and *ščo*. This fact is perhaps unsurprising for *wh*-PPs, given that PPs often have freer word order than DP arguments. As for *ščo*, our results corroborated previous findings that *ščo* triggers free word order (Rudin 1996, Batshuski 2008). Our results for Ukrainian in fact parallel similar observations made in Bulgarian; while Bulgarian has been characterized as a language with Superiority effects, *wh*-PPs have freer order and sentences with *kakvo* 'what' exceptionally exhibit free word order in some contexts (Billings & Rudin 1996):

(13)   Bulgarian (Billings & Rudin 1996: 38)
    a.   Kakvo   kogo   e udarilo?
        what.NOM who.ACC   hit
    b.   Kogo   kakvo   e udarilo?
        who.ACC   what.NOM hit
        'What hit whom?'

Future work may shed light on what makes Ukrainian *ščo* and Bulgarian *kakvo* special as lexical items. One speculation is that *ščo* and *kakvo* may have a historically fused preposition, accounting for their similar behavior to *wh*-PPs.

Finally, we consider the possibility that the variation in our data between Ukrainian A and B may be due to language contact with Russian, which does not exhibit Superiority in MWF constructions (Bošković 2002). If contact was indeed a factor, then we would expect speakers of the freer Ukrainian B pattern to have had more contact with Russian. All of our participants, however, were fluent speakers of Russian in addition to Ukrainian. Furthermore, the speaker with the highest degree of early language contact with Russian displayed the more restricted Ukrainian A pattern, which is the opposite of we would expect. We therefore maintain that our results provide evidence for (at least) two distinct varieties of Ukrainian which differ with respect to Superiority.

4. Conclusion and outlook. In this study, we found that while all Ukrainian speakers permit free order in matrix MWF sentences with a *wh*-PP or *ščo* 'what', two distinct patterns emerged with respect to Superiority; Ukrainian A speakers exhibited Superiority effects while Ukrainian B speakers did not.

What do these results mean for the wider typology of MWF in Slavic? Firstly, it indicates that Superiority is orthogonal to Rudin's (1988, 1996) +/−MFS classification and may exhibit no correlations with other diagnostic syntactic phenomena such as *wh*-islands. Superiority is thus a property to be examined independently, as Bošković (1999, 2002) does in his three-way typology based on Superiority in both short-distance and long-distance MWF. Our results showed that Ukrainian A exhibited Superiority effects in short-distance (matrix) questions, thereby patterning with Type 1 languages such as Bulgarian, as shown in Table 5. According to Bošković's proposal, MWF in Ukrainian A would thus involve *wh*-movement. Ukrainian B, on the other hand, displayed no Superiority effects in short-distance questions and would therefore belong to one of the other two types, which employ focus movement in short-distance MWF. Types 2 and 3 differ

with respect to Superiority in long-distance MWF, which we did not investigate in this study. If we adopt the reasonable speculation that the two varieties of Ukrainian would pattern similarly in long-distance questions, then we might expect Ukrainian B to align with Type 2 languages such as Serbo-Croatian. Earlier work suggests that long-distance MWF may not be available in Ukrainian (Rudin 1996, Batshuski 2008), which may be a complicating factor for the classification of Ukrainian; a more systematic investigation of long-distance questions is left for future research.

Exhibits Superiority effects in:	Type 1 Ukrainian A (Bulgarian)	Type 2 Ukrainian B? (Serbo-Croatian)	Type 3 (Russian)
Short-distance MWF	✓	✗	✗
Long-distance MWF	✓	✓	✗

Table 5. Ukrainian and Bošković's typology

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