TITLE: **Variation in the Expression of Universal Quantification and Free Choice: The Case of Hausa *koo*-wh Expressions**

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Variation in the Expression of Universal Quantification and Free Choice: The Case of Hausa *koo*-wh Expressions*

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Abstract

I argue that the interpretation of expressions consisting of disjunction marker and *wh*-element (wh-DISJ expressions), which varies across languages, constitutes a case of semantic variation. In Hausa, these expressions denote universal generalized quantifiers, which give rise to free choice effects in intensional contexts (Giannakidou 2001). The universal meaning is derived in compositional fashion, where the disjunction marker expresses set union over the *wh*-domain. The free choice effects follow from the scopal interaction of universal quantifier and intensional operator. The account relates to Giannakidou & Cheng's (2006) analysis of (quasi)universal FCIs, but it does not extend to Japanese and Malayalam wh-DISJ expressions, which are interpreted with existential force and should be analyzed as indeterminate pronouns (Jayaseelan 2001, Kratzer & Shimoyama 2002). Motivated by the analysis of FCIs in Menendéz-Benito (2005), we finally consider an alternative analysis of *koo*-wh expressions as selective indeterminate pronouns, which is rejected on conceptual and empirical grounds.

Keywords: free choice, universal quantification, generalized quantifier, propositional quantifier, semantic variation, disjunction, indeterminate pronoun, Hausa

1. Introduction

The article presents an detailed case study of semantic variation: A set of morphologically complex expressions [α β γ] that consist of the same basic building blocks receives

interpretation $I_1(\alpha)$ in one set of languages, but a different interpretation $I_2(\alpha)$ in another set of languages. As a result of this semantic difference, the expressions in question also differ in their syntactic distribution across languages. Thus, we will also be concerned with syntactic variation of the sort that is triggered by semantic factors.

In particular, the article puts forward an analysis of the syntactic distribution and semantic interpretation of a closed class of nominal expressions in Hausa (Chadic, Afro-Asiatic). The expressions belonging to this class are morpho-syntactically complex: They consist of a *wh*-expression, corresponding to *who*, *what*, *where*, *when*, etc. and a marker *koo*, as illustrated in (1). For convenience, we refer to this kind of complex expressions as *koo-wh expressions*.

(1)	a.	*koo-waa/ koo-wàaneenèe*	= koo + who	'everyone', 'anyone'
	b.	*koo-mee*	= koo + what	'everything', 'anyone'
	c.	*koo-wànè* +NP	= koo + which	'every' + NP, 'any' + NP
	d.	*koo-'ìnaa*	= koo + where	'everywhere', 'anywhere'
	e.	*koo-yàushee*	= koo + when	'always', 'anytime'
	f.	*koo(ta)yàayàa*	= koo + how	'in every way', 'anyway'

Semantically, *koo*-wh expressions give rise to two interpretations depending on their syntactic position and context: First, they can be interpreted as distributive quantifiers with universal force, as indicated in the English paraphrases in (1). On their second interpretation, they resemble the English Free Choice Item (FCI) *any* in many ways. One of the objectives of this article is to shed more light on the semantic relationship between the universal and the FC-use of *koo*-wh expressions.

Interestingly, the marker *koo* occurs independently on three different, but related uses (Meyers 1974). First, it is used as the disjunction marker corresponding to English *or*, cf.

(2ab). Second, it occurs as the Q-marker in Y/N-questions, cf. (2c). This double function as disjunction marker and Q-marker is well-attested cross-linguistically, cf. Jayaseelan (2001). Third, *koo* functions as emphatic scalar expresssion corresponding to English *even*, cf. (2d).

(2) a. *kàawoo manà kòofii* ***koo*** *tî !* (Newman 2000:132)

bring us coffee DISJ tea

'Bring us coffee or tea!'

b. *zâ-i daawoo nân dà awàa biyu* ***koo*** *zâi bugàa manà wayàa*

FUT-3sg return here in hour two DISJ FUT-3sg hit us wire

'He will return within two hours or he will call us.' (Newman 2000:132)

c. ***koo*** *kaa sàami gyàɗaa mài yawàa?* (Cowan & Schuh 1976:216)

DISJ/Q 2sg.m.PERF get peanut many

'Did you get a lot of peanuts?'

d. ***koo*** *jàariirìi yaa san hakà* (Ma Newman 1990:85)

even infant 3sg.m.PERF know that

'Even a child knows that.'

It is worth pointing out that the presence of *koo* invokes alternatives on all its occurrences as an independent morpheme. Disjunctive *koo* serves to juxtapose several alternatives of the same semantic type (T.E. Zimmermann 2000, Geurts 2005, Simons 2005, Alonso-Ovalle 2004, 2005, 2006). Question *koo* asks for the true proposition from among a set of alternative propositions. Instances of scalar *koo* trigger scalar implicatures over sets of alternatives. The null hypothesis concerning the semantic function of *koo* in *koo*-wh expressions is thus that *koo* indicates the presence of alternatives in this case, too.

From the perspective of cross-linguistic variation, there are two aspects of their syntactic and semantic behavior that make *koo*-wh expressions particularly interesting. First, complex expressions consisting of a *wh*-expression and a disjunction marker (henceforth: wh-DISJ expressions) are found in other languages as well, such as e.g. Malayalam, Kannada and Japanese. However the wh-DISJ expressions in these languages differ in interpretation. They are interpreted with existential quantificational force, and not with universal force as their Hausa counterparts. Relevant data are presented in section 3.2. The observed cross-linguistic variation in the interpretation of wh-DISJ expressions gives rise to the first research question:

(Q1) How to explain that elements with the same morpho-syntactic structure (wh+DISJ) receive different semantic interpretations in different languages?

In particular, do the differences in semantic interpretation follow from structural, i.e. syntactic differences? Or are the different interpretations the reflex of entirely different semantic composition procedures that operate on these morpho-syntactically identical expression types? We attend to these questions in section 3, where it is shown that a unified syntactic analysis of the observed variation is possible in principle. On the unified account, the disjunction marker in a wh-DISJ expression has semantic import and denotes the Boolean *join*-operator cross-linguistically. Languages differ in the syntactic position of this *join*-operator, though. If the operator combines locally with the *wh*-expression, it acts as a maximizing element by inducing set union, and the universal reading results (Hausa, Korean).

This analysis of the universal force of Hausa *koo*-wh expressions is very similar in spirit to Giannakidou & Cheng's (2006) analysis of the (quasi)universal force of FCIs in Greek and Mandarin, which is attributed to the workings of a maximizing iota-operator (denoted by the definite article *o* in Greek and the element *dou* in Mandarin). The parallel behavior of

(quasi)universal elements in Greek and Mandarin gives some support to the analysis of Hausa *koo*-wh expressions as universal generalized quantifiers (GQs). More generally, the local operator-analysis of *koo*-wh expressions suggests that not everything that looks like a *wh*-indeterminate, i.e. a nominal expression built around a *wh*-item, is in fact a *wh*-indeterminate, a point also made in Giannakidou & Chengs (2006), as pointed out by a reviewer. That is, there are languages in which apparently indeterminate expressions do not rely on propositional quantification for interpretation, but denote generalized quantifiers instead.

As for the existential interpretation of wh-DISJ expressions in Japanese and Malayalam, one might argue that the *join*-operator raises to the clausal level where it applies to the proposition containing the *wh*-expression. In this case, it acts as a disjunctive connector, giving rise to an existential reading. The different interpretations of wh-DISJ expressions as universal (Hausa) or existential (Japanese, Malayalam) would thus depend on a structural difference, namely on whether the *join*-operator combines with the *wh*-expression locally at the DP-level, thus forming a GQ, or (at a distance) at the clausal level, resulting in propositional quantification. Unfortunately, it is not at all clear that the disjunction marker is really located at the clausal level in languages like Japanese and Malayalam (Jayaseelan 2001). Because of this, an alternative analysis on which the different interpretations of wh-DISJ expressions follow from different interpretive mechanisms is tentatively put forward at the end of section 3.

The second interesting semantic property of Hausa *koo*-wh expressions (and their wh-DISJ counterparts in Korean) is that they show characteristic traits of FCIs: First, their presence often induces domain widening, just like English *any* (Kadmon & Landman 1993). Second, they seem to double as negative polarity items, again like English *any*. Third, they frequently occur with modifying relative clauses same as English *any* in subtrigging contexts. At the same time, *koo*-wh expressions in Hausa differ from FCIs in other languages in that their syntactic distribution is much wider. Most notably, they occur in episodic contexts and they

show no quantificational variability effects in the presence of other (modal) quantifying elements. These observations give rise to the second research question.

(Q2) What is the nature of cross-linguistic variation in the expression of Free Choice?

The investigation of *koo*-wh expressions on their FCI-use should shed light on the following questions: Are they (indefinite) indeterminate expressions or universal quantifiers? (ii.) Are they restricted to modal contexts? (iii.) What is their relation to NPIs? We attend to these questions in section 4. The upshot of the discussion is that Hausa (same as Korean) shows no formal difference between ordinary universal quantification and FC quantification, as already pointed out in Haspelmath (1997). This suggests that the phenomenon of FC in Hausa is best captured in terms of universal quantification, as has been argued for English *any* in Dayal (1998, 2004) and Aloni (2007), for Scandinavian FCIs in Saeboe (2001), and for Spanish *cualquiera* in Menéndez-Benito (2005), among others. To the extent that the semantic process of universal quantification can be likened to certain maximization operations, the analysis is also compatible with the analysis of (in)definite FCIs in Greek and Mandarin in Giannakidou & Cheng (2006).

The article is structured as follows. Section 2 gives some background information on the grammar of Hausa and a brief sketch of its quantificational system. The discussion draws largely on the empirical surveys in Zimmermann (2005, 2008). Section 3 forms the central part of the article. After discussing the syntactic distribution and semantic interpretation of *koo*-wh expressions in Hausa and the observable cross-linguistic variation in the semantic interpretation of such wh-DISJ expressions as existential and universal quantifiers, respectively, the section presents a compositional analysis of Hausa *koo*-wh expressions as generalized quantifiers with universal force. It is shown how the analysis accounts for the

different interpretive effects with *koo*-wh expressions in different syntactic contexts (positive episodic, negative, and modal), and how it can be extended in order to derive the existential readings of wh-DISJ expressions in languages of the Japanese/Malayalam type. Given that extending the analysis is not unproblematic (see above), the section tentatively settles for an account in terms of semantic variation, on which wh-DISJ expressions are interpreted by different semantic mechanisms in different languages. Section 4 discusses a second dimension of cross-linguistic variation, the expression of free choice, by comparing Hausa *koo*-wh expressions with FCIs in other languages. Based on the fact that *koo*-wh expressions sometimes allow for FC-readings, we briefly consider (and reject) an alternative analysis that is based on Menendéz-Benito (2005), and on which Hausa *koo*-wh expressions are treated as selective indeterminate pronouns that occur in the scope of a covert propositional quantifier with universal force. Hausa *koo*-wh expressions would differ from proper FCIs like *any*, however, in that they do not come with the additional restriction that the alternative propositions induced by the indeterminate be mutually exclusive. This analysis captures the formal identity of universal quantifiers and FCIs in Hausa, and for the wider distribution of Hausa *koo*-wh expressions as opposed to FCIs in other languages. Nonetheless, we will reject it in favor of the GQ-analysis from section 3 for empirical and conceptual reasons. Section 5 summarizes and concludes with some general remarks on the nature of cross-linguistic variation in interpretation.

2. The Quantificational System of Hausa

2.1 Some background information on Hausa.

Hausa is a Chadic language from the Afro-Asiatic phylum, spoken mainly in Northern Nigeria and Niger (Newman 2000, Jaggar 2001). It is a tone language with three lexical tones: high, low (indicated by '`'), and falling (indicated by '^'). Its basic word order is SVO(X) and

there is no case morphology. The syntactic function of the arguments is determined by their relative order relative to the verb, and by means of an obligatory subject pronoun. The subject pronoun combines with the preverbal TAM-marker, often in form of a portemanteau morpheme. It is often, but not necessarily accompanied by a full subject NP, cf. (3a).[1] Typically, this is the case when the subject introduces a new topic.

(3) a. *(Sauna) yaa nùfi kàasuwaa*
Sauna 3sg.m.PERF go.towards market
'Sauna / He went to the market.'

Focused and questioned constituents can move to a left-peripheral position, cf. (3bc). For focused and questioned subjects, such focus movement is obligatory. Overt focus movement is accompanied by so-called relative morphology on the TAM-marker, and, optionally, by the particle *nee/cee* (with polar tone), which follows the focused constituent (Tuller 1986).

(3) b. ***mèenee nèe*** *su-**kà*** *kaawoo* ***t₁*** *?*
what PRT 3pl-PERF.REL bring
'What did they bring?'

c. ***rìigaa₁*** ***(nèe)*** *su-**kà*** *kaawoo* ***t₁*** vs. *su-**n*** *kaawoo rìigaa*
gown PRT 3pl-PERF.REL bring 3pl-PERF bring gown
'It was A GOWN that they brought' 'They brought a gown.'

Negation is typically expressed by a discontinuous bracket *bà(a)…ba*, which encompasses either the vP, or the entire clause (Newman 2000: 357), cf. (3de). The first kind of negation is referred to as *vP-negation*. The second kind of negation brackets the entire clause and only

occurs with overtly fronted focus constituents. It has the semantic effect of narrowly negating the focus constituent only, cf. (3e), and will be referred to as *focus negation*.[2] Syntactically, focus negation is assumed to attach to a complex CP containing the focus projection FocP:

(3) d. *Hàwwa* ***bà*** *tà* *daawoo* ***ba***

H. NEG 2sg.f.SUBJ return NEG

'Hawwa did not return.'

e. ***bàa*** *Tàlaatù ta* *zàagee* *shì* ***ba*** [Newman 2000: 187]

NEG T. 3sg.f.PERF.REL insult 3sg.m NEG

'It was not TALATU who insulted him.'

The difference between vP-negation and focus negation will come to play crucial role in the analysis of *koo*-wh expressions in section 3, as these behave differently in the two negation contexts. In particular, they are interpreted with negative existential force (*no*, *not any*) under vP-negation, but with universal force (*not every*) under sentential negation.

NP-internally, the head noun typically precedes all modifying material, such as adjectives, PPs, and NPs. An example with N>A is shown in (3f). The definite article *-`n(m.)/-`r(f.)* likewise follows the head noun, cf. (3g):

(3) f. *ìngarmà* ***saaboo***

stallion new

'a/the new stallion'

g. *jàakî-**n***

donkey-DEF.M

'the donkey'

The relative order of head noun and NP-modifiers plays a crucial role in the analysis of numeral expressions and other weak quantifying expressions (*many, few*) in section 2.2.2.

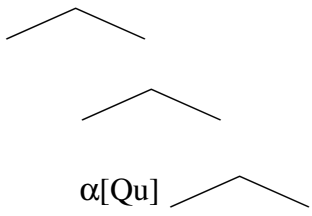
2.2 Syntactic and Lexical Quantification in Hausa

This section discusses the different ways in which quantificational effects over the domain of NP-denotations, i.e. the domain of individuals, come about in Hausa. Theoretically, there are two options, namely lexical and syntactic quantification. They are introduced in section 2.2.1. In sections 2.2.2 and 2.2.3, it is argued that Hausa makes use of both strategies for expressing existential quantification. Section 2.3 turns to universal quantification, which is argued to be lexical, since it is expressed by means of a generalized quantifier.

2.2.1 Two quantificational procedures: Lexical and syntactic quantification. In principle, quantification over individuals can come about in two different ways. The main difference between the two strategies concerns the question of when and how the quantificational operator enters the semantic derivation of the meaning of a sentence.

We define an NP α as *lexically quantificational* if α introduces a quantificational operator into the semantic representation as part of its lexical meaning, cf. (4). In this case, α is an operator element with inherent quantificational force. Hence the term *lexical quantification*.

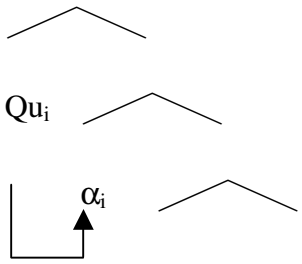
(4)



In contrast, an NP α is syntactically quantified over if it does not introduce a quantificational operator into the semantic representation by itself. The effect of quantification over the domain denoted by α is achieved by a (possibly covert) quantificational operator *Qu* that takes syntactic scope over α and assigns α its apparent quantificational force, e.g. by binding

a variable introduced by α (Heim 1982). In this case, α has no inherent quantificational force, which is provided by the operator *Qu*. The interpretive relation between *Qu* and the denotation of α is syntactically mediated, e.g. through the structural notion of c-command, cf. (5). Hence the term *syntactic quantification*.

(5)



An alternative to the quantification-through-binding procedure, which also relies on c-command, is to assume that the NP α introduces a set of Hamblin-alternatives that project to the sentential level. Here, they can be bound by various propositional operators that quantify over sets of alternative propositions, see below. This implementation originates in Kratzer & Shimoyama's (2002) work on Japanese and will become relevant in sections 3 and 4.

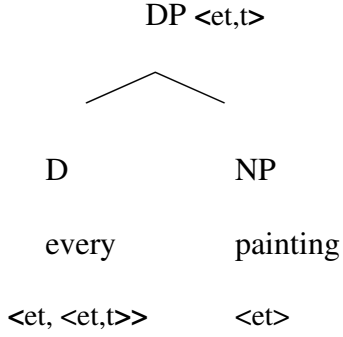
The theoretical literature offers different positions on the question of which quantificational strategy is employed in natural languages. In their seminal work, Barwise & Cooper (1981) assume only lexical quantification and analyze all kinds of NPs as *Generalized Quantifiers* (GQ), see also Keenan (1996). On the GQ-analysis, all adnominal quantifying expressions have quantificational force and denote second-order relations between two sets A and B. Their semantic type is <et, <et,t>>, as illustrated in (6ab):

(6) a. $[[\text{every}]] = \lambda P_{<et>}.\lambda Q_{<et>}.\ \forall x\ [P(x) \rightarrow Q(x)]$

b. $[[\text{two}]] = \lambda P_{<et>}.\lambda Q_{<et>}.\ \exists x\ [|x| \geq 2 \wedge P(x) \wedge Q(x)]$

Syntactically, quantifying expressions of this type are often analyzed as functional D-heads that take NP-arguments (e.g. Barwise & Cooper 1981:162, 171), cf. (7). The NP-denotation provides the quantifier with its domain of quantification.

(7)



Next to the GQ-tradition, there is another approach to quantification that was first formulated in the framework of DRT and file change semantics (Kamp 1981, Heim 1982, Kamp & Reyle 1993). These authors assume that natural language exhibits instances of both lexical and syntactic quantification. This theoretical conclusion is based on the well-known observation that the at first sight homogenous class of quantifying expressions falls into two subclasses that differ in semantic respects (e.g. symmetry/asymmetry, quantificational (in)variability, the (in)ability to serve as antecedent for cross-sentential anaphora) and syntactic respects (+/- occurrence in existential *there*-sentences). The two groups in question are: (i.) the group of genuine quantificational expressions (GQs), such as *every/each/most/exactly n NP*, which contribute the quantificational force as part of their lexical entry, cf. (8a); and (ii.) the group of modifying expressions that have no quantificational force by themselves, but function as ordinary predicates on (groups of) individuals, cf. (8b). The latter expressions inherit their quantificational force from a covert c-commanding existential quantifier via the process of existential closure. To this class belong indefinite determiners, as well as numerals, and other quantificational elements (*many*, *few*) occurring in indefinite DPs.

(8) a. [[every]] = $\lambda P_{<et>}.\lambda Q_{<et>}.\ \forall x\ [P(x) \rightarrow Q(x)]$ (= (6a))

b. [[two]] = $\lambda x.\ |x| \geq 2$

By and large, this semantic distinction into two groups of quantifying elements corresponds to the traditional distinction into [+/- existential] quantifiers (Keenan 1987), or into weak and strong quantifiers (Milsark 1977), as listed in (9):

(9) i. *weak quantifiers*: *a*, *sm* (unstressed form of *some*), numerals, *mny*, *few*, …

ii. *strong quantifiers:* *the*, *every*, *each*, *all*, *most*, *sóme*, *féw*, *mány*

In the following, we occasionally employ the terms *weak* and *strong quantifier* as mere descriptive labels.

A comparable intermediate position on quantification is adopted in Kratzer & Shimoyama's (2002) analysis in terms of quantification over Hamblin-alternatives (Hamblin 1973). The authors assume that there are two kinds of quantificational operators. These apply at different syntactic levels and accordingly range over sets of alternatives of different kinds: *D-quantifiers* apply at the NP-level and range over sets of alternative individuals. *Propositional quantifiers* apply at the sentential level and range over sets of alternative propositions.

A more radical position is found in Butler (2004) and Kratzer (2004). These authors assume that the only quantifying mechanism in natural language is syntactic quantification with (covert) quantifiers over alternative propositions. Consequently, there are no NPs with inherent quantificational force at all. The sole function of an NP is to provide a Hamblin-set of alternatives that projects to the level of alternative propositions in a fashion familiar from

alternative projection in focus semantics (Rooth 1985). Eventually, the set of alternative propositions is quantified over by a c-commanding propositional quantifier. As a result, the difference in lexical form, say between *every* and *some*, does not indicate a difference in the denotational meaning of the NP itself, but only indicates agreement with different propositional quantifiers. For instance, the NPs *every dog* and *a/one dog* would have the same denotation when ranging over the same universe of discourse. This is shown in (10ab). (10) also shows that the difference in form between the two NPs merely governs which propositional quantifier the respective NPs must combine with.

(10) a. $[[\text{every}_{\forall}\ \text{dog}]] = \{d_1, d_2, d_3, \ldots\}$ $\Rightarrow$ associates with the *universal* propositional quantifier only

b. $[[\text{a/one}_{\exists}\ \text{dog}]] = \{d_1, d_2, d_3 \ldots\}$ $\Rightarrow$ associates with the *existential* propositional quantifier

The meaning of the propositional $\exists$- and $\forall$-quantifiers is specified in (11ab).

(11) *Propositional Quantifiers (Kratzer & Shimoyama 2003, Kratzer 2004)*

a. $\forall_p(A) = 1$ iff every proposition in the set of alternative propositions A is true.

b. $\exists_p(A) = 1$ iff at least one proposition in the set of alternative propositions A is true.

For illustration, consider the interpretation of (12ab) with universal and existential quantification, respectively.

(12) a. Every dog barked.

b. A/Some/One dog barked.[3]

Assuming that the discourse universe contains three dogs, i.e. d_1, d_2, and d_3, (12ab) both give rise to the same set of alternative propositions. Point-wise functional application of the VP-meaning to the denotation of the subject NP, the set D = $\{d_1, d_2, d_3\}$, yields the set A in (13), which is the semantic argument of the propositional quantifier:

(13) A = {d_1 barked, d_2 barked, d_3 barked}

For a felicitous application of the universal quantifier it is necessary that every proposition in A be true, which is the case if and only if every dog in D barked. Felicitous application of the existential quantifier only requires that at least one proposition in A be true, which is the case if and only if at least one dog in D barked.

In effect, then, it is possible to replicate the semantic effects of lexical quantification by a combination of Hamblin alternatives, alternative projection, and syntactic (= propositional) quantification. The radical propositional approach to quantification resembles the standard treatment of quantification in logic, where all quantifying operators ($\forall$, $\exists$, $\neg$) are propositional by definition. However, the radical propositional account encounters a serious problem when applied to quantification in natural language as it incurs a systematic mismatch between the syntax and semantics of nominal quantifying expressions: The quantificational force of a DP is never derived from an overtly expressed functional element inside the DP, but from an abstract quantifying element higher up in the structure. Because of this mismatch, one should not easily dispense with the option of lexical quantification in the nominal domain, the standard GQ-treatment of Barwise & Cooper (1981), that is. In other words, the syntactic (= propositional) approach to quantification should be handled with care in the absence of overt morpho-syntactic evidence, and only called upon if the alternative account in

terms of lexical quantification is not feasible. In light of these general considerations, we now turn to the question of whether Hausa expresses quantification by means of lexical quantification, syntactic quantification, or by a mixture of both.

2.2.2 Syntactic Quantification in Hausa: Quantificational NP-Modifiers. This subsection analyzes numerals and other weak quantificational modifiers occurring in indefinite DPs (*many*, *few*) as involving syntactic quantification. It is shown that these weak quantifying expressions do not differ syntactically from other NP-modifiers, suggesting an adjectival status for these elements. Semantically, weak quantified DPs give rise to quantificational variability effects and they can function as antecedents for cross-sentential anaphora. In addition, the expressions in question cannot take scope over a c-commanding negation operator. These findings argue against an analysis as generalized quantifiers.

In Hausa, weak quantifiers occur in postnominal position. This is illustrated for numeral expressions and for the quantity expressions corresponding to *many* and *few* in (14a-c).

(14) a. i. *yaaròo* ***ɗaya***

boy one

'one boy'

ii. *ɗàalìbai* ***biyu / ukù***

student.PL two / three

'two / three etc. students'

b. i. *lookàcii* ***mài*** ***yawàa***

time owner.SG quantity

'much time'

ii. *maataa* ***[dà yawàa]*** / ***[màa-su yawàa]***

women with quantity owner-PL quantity

'many women'

c. i. *kuɗii* ***kàɗan***

money little

'little money'

ii. *birai* ***kàɗan***

monkeys few

'few monkeys'

Syntactically, the weak quantifying expressions in (14) exhibit a number of properties typical of adnominal modifiers. First, they occur in postnominal position, as do adjectival and PP-modifiers (15a-c). Second, some of them (*da yawàa*, *mài/màasu yawàa*) employ the same linkers as other modifiers (15bc). Third, they can be followed by other adjectives (16a). And fourth, they can occur in predicative position (16b).

(15) a. *gidaa* ***farii*** 'white house' (cf. 14a)
house white

b. *yaaròo* ***dà*** ***sàndaa*** 'boy with a stick' (cf. 14bii)
boy with stick

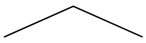
c. *yaaròo* ***mài*** ***hùulaa*** 'boy with a cap' (cf. 14bi)
boy owner cap

(16) a. *mootoocii* ***bìyar*** *jaajàayee* 'five red cars'
cars five red

b. *maata-nsà* ***huɗu*** 'His wives are four.'
wives-his four

The parallels observed in (14)-(16) strongly support an analysis of weak postnominal quantifying elements as adnominal modifiers. As modifying elements, they can thus be analyzed as property-denoting expressions of type <e*,t>, where semantic type e* ranges over atomic and group individuals alike, cf. (17). The meanings of modifier and head noun combine by predicate modification (Heim & Kratzer 1998).

(17) NP **<e*,t>**



NP **<e*,t >** AP/PP **<e*,t>**

ɗàalìbai biyu / dà yawàa

As modifying elements, weak quantificational expressions in Hausa impose a subset restriction on the denotation of the modified NP. This means that these expressions do not carry any quantificational force by themselves. This conclusion is supported by semantic evidence, as discussed in Zimmermann (2008). First, NPs modified by a numeral can be unselectively bound by a higher quantifier and give rise to quantificational variability effects:

(18) ***kullum in ɗaalìbai biyu*** *sun gàmu dà juunaa à cikin gàrii,*

always if students two 3pl.PERF meet with each.other at inside town

su*-kàn tsayàa, su-kàn yi taaɗi*

3pl-HAB stop 3pl-HAB do chatting

'Always, if two students meet in town, they stop and have a chat.' =

'*Any* two students that meet in town meet and have a chat.'

Second, NPs containing a modifying quantificational expression can serve as antecedents for anaphoric reference across sentential boundaries, cf. (19), again unlike what is found with inherently quantificational GQs (Heim 1982, Kamp & Reyle 1993).

(19) *àkwai* ***mutàanee*** ***dà yawàa*** *à kàasuwaa.* ***su****-nàa* *yî-n* *cìnikii*

exist people many at market 3pl-PROG doing-LINK trading

'There were *many people* at the market. *They* were trading.

Finally, NPs with weak quantificational expressions cannot take scope over a c-commanding negation operator, cf. (20a). In order to take scope over negation, they must move to a c-commanding position as shown in (20b). See Zimmermann (2008) for discussion.

(20) a. *Audù* ***bà-i*** *ci* *yàazaawaa* ***biyu*** ***ba***

Audu NEG-3sg eat cashew two NEG

'Audu didn't eat two cashews.'

NOT: 'There are two cashews that Audu did not eat.'

b. *[yàazaawaa biyu]$_1$* *nèe* *Audù* ***bà-i*** *ci* *t_1* ***ba***

cashew two PRT Audu NEG-3sg eat NEG

'There are two cashew fruit that Audu didn't eat.'

The obligatory narrow scope of *yàazaawaa biyu* under negation in (20a) parallels the scopal behavior of bare plurals in English. As shown in (21), the latter obligatorily scope under negation as well. For this reason, bare plural NPs are often analyzed as possessing no quantificational force of their own. If they did, they should be able to quantifier-raise across the negative operator, in which case they would outscope it at LF. See Carlson (1977) and McNally & van Geenhoven (2005), among others, for relevant discussion.[4]

(21) Mary did not buy horses.

NOT: There are (some) horses that Mary did not buy.'

Based on the foregoing observations, we conclude that postnominal quantificational modifiers in Hausa involve syntactic quantification. The existential force of the clause is not introduced as part of the lexical meaning of these expressions, but by a covert existential quantifier higher up in the clause.

From a cross-linguistic perspective, the analysis in (17) of weak quantifiers as NP-modifiers is not surprising. Analogous analyses have been put forward for numerals and other weak quantifiers in English and German, see e.g. Kamp (1981), Heim (1982), Hoeksema (1983), Higginbotham (1987), Kamp & Reyle (1993). In these languages, too, weak quantifiers show quantificational variability effects and behave like modifying adjectives syntactically. They can be preceded by the definite determiner (plus other adjectives), cf. (22a), or by strong quantifiers (in D), cf. (22b), and they can function as predicates, cf. (22c).

(22) a. the (notorious) *two* arguments against UG

b. every *two* weeks

c. His sins were *many*.

It seems, then, that syntactic quantification is an option that is cross-linguistically available.[5]

2.2.3 Lexical Quantification in Hausa: Existential wani. Next to indefinite expressions with quantificational modifiers, there is a second class of nominal expressions that are interpreted with existential force, but which differ from the former syntactically and semantically. They are introduced by the functional expression *wani(m.)/ wata(f.)/ wa(ɗan)su(pl.)* 'some, a certain', as illustrated in (23). We refer to this kind of indefinite expressions as *wani*-expressions. Their existential interpretation is exemplified in (24).

(23) *wani / wata / wa(ɗan)su* ‘some (other), a certain (m./ f./ pl.)’

i. wani mùtûm ‘some man’

ii. wata màcè ‘some woman’

iii. wa(ɗan)su mutàanee ‘some men’ = ‘some people’

(24) ***wani*** *yaa zoo* [Bargery –Online]

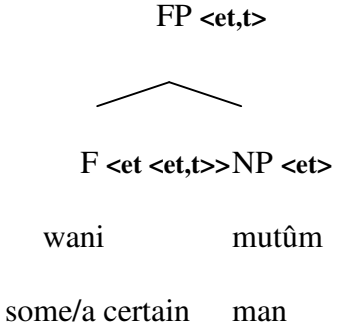
someone 3sg.PERFcome

‘Somebody(sg.) came.’

Unlike all the other quantifying elements discussed so far, *wani*-determiners occur in prenominal position, a property that they share with other functional elements, such as the demonstrative *wannàn* in *wannàn dookìi* ‘this horse’. In addition, they exhibit gender and number agreement, but no genitive linker as, e.g., in *ƙoofà-**n** ɗaakìi-n* ‘door of house-DEF’.

For this reason, we analyze *wani/wata/wasu* as functional heads of a functional projection FP, cf. (25).[6] As functional elements, they receive the standard GQ-treatment for inherent quantifiers as being of type <et, <et,t>>.

(25)



As for the semantic interpretation of *wani*-expressions, it is instructive to observe that they alternate with bare indefinite expressions. Jaggar (1988) shows that the choice between the two options largely depends on discourse-semantic considerations. Unlike bare indefinites, *wani*/*wata*/*wasu* are preferably used for introducing new discourse referents that can be anaphorically referred to in subsequent discourse. According to Jaggar (1988), this accounts for their preferred occurrence with [+human] subject DPs. Semantically, this discourse-introducing function can be captured by endowing them with existential force. On this view, the presence of a *wani*-expression would assert the existence of an individual with a particular property denoted by the NP-complement. A common way of implementing this effect is to treat *wani/wata/wasu* as genuine existential quantifiers that combine with an NP to yield a generalized quantifier. This is shown in (26ab).

(26) a. [[wani/wata/wasu]] $= \lambda P \in D_{<e,t>}. \lambda Q \in D_{<e,t>}. \exists \mathbf{x} [P(x) \wedge Q(x)]$

b. [[wani mutûm]] $= \lambda Q \in D_{<e,t>}. \exists \mathbf{x} [man'(x) \wedge Q(x)]$

Additional support for treating *wani*-expressions as genuine existential quantifiers comes from their behavior under negation and in Y/N-questions. Looking at negation first, *wani*-expressions can take semantic scope over a c-commanding negation operator, unlike the weak quantifiers discussed in the preceding subsection. As a result, (27) is ambiguous between the negative existential ($\neg\exists$) reading in (i), which corresponds to *no, no-one*, and the *some-not* ($\exists\neg$) reading in (ii), where the *wani*-expression takes semantic scope over vP-negation.

(27) *Muusaa* ***bà****-i* *kira* ***wani àbookii*** *lìyaafaa* ***ba***

Musa NEG-3sg invite some friend ceremony NEG

i. ‘Musa did not invite any friends.’ ⇔ ‘Musa invited no friends.’

ii. ‘There is some friend that Musa didn’t invite (but he invited others).’

The ambiguity of (27) is accounted for if the DP *wani àbookii* is a generalized quantifier. As such, it can optionally undergo QR, yielding (27’).

(27’) ***[wani àbookii]$_1$*** *Muusaa* ***bà****-i kiraa* t_1 *lìyaafaa* ***ba***

The application of QR is licensed since (27’) differs in truth conditions from the surface structure in (27) (cf. Fox 2000). (27’) gives rise to the ∃¬-reading in (27ii), whereas the surface word order gets the ¬∃-interpretation in (27i).

A similar ambiguity shows up with *wani*-expressions in Y/N-questions. In (28), the *wani*-expression can be interpreted on a specific (28i) or non-specific (28ii) construal.

(28) ***Wani*** *yaa zoo*? [Cowan & Schuh 1976:278]

some 3sg.PERFcome

i. ‘Did someone come?’

ii. ‘Did anyone come?’

In this case, too, the ambiguity seems to follow from scopal interaction, here between the existential quantifier *wani* and the question operator *?*. When the question operator takes scope over the existential operator, we get the non-specific interpretation in (28ii). In case the existential operator takes scope over the question operator, the result is the specific interpretation in (28i). (29) shows the relevant configurations with informal paraphrases.

(29) a. specific: ∃x person'(x) [? …]

≈ 'For some person x, did x come?'

b. non-specific: ? [∃x person'(x) …]

≈ 'Is there a person x that came?'

In sum, the syntactic and semantic behavior of *wani*-expressions argues for analysing them differently from the weak quantificational modifiers in section 2.2.2, namely as inherently quantified DPs (=GQs) with existential force. The GQ-analysis for *wani*-expressions implies that Hausa instantiates both mechanisms of syntactic and lexical quantification. This naturally leads to the question of how universal quantification is grammatically encoded in Hausa, and whether there is a universal counterpart to the existential *wani*-expressions. The question is answered in the positive in sections 2.3 and 3, where it is shown that *koo*-wh expressions are plausibly analyzed as universal generalized quantifiers.

2.3 Universal Quantification in Hausa

Just as English and German (and many other languages), Hausa has two ways of expressing universal quantification with nominal constituents. The first kind is instantiated by the quantificational expression *duk(à)*, which corresponds to English *all* and allows for collective interpretations. The second kind is instantiated by *koo*-wh expressions, our principal topic of investigation. These expressions are closer to English *each/every* in forcing a distributive universal interpretation This section shows that there are additional structural differences between the two kinds of universal expressions. Based on this, the quantifying expression *duk(à)* is analyzed as a modifying element without inherent quantificational force. In contrast, the syntactic and semantic properties of *koo*-wh expressions provide evidence for their

analysis as universal GQs, i.e. as inherently quantified expressions. The discussion draws largely on Zimmermann (2008) and references cited there.

Looking at the distribution of *duk(à)* first, this element can occur before or after the head NP, apparently without a significant change in meaning, cf. (30ab). Moreover, *duk(à)* shows no agreement with the head noun, same as the NP-modifiers discussed in 2.2.2 (Newman 2000:388):

(30) a. *duk* faasinjoojî-*n* vs. faasinjoojî-*n* *dukà* [Newman 2000:388]
all passengers-DEF passengers-DEF all
'all the passengers'

b. *duk* àbinci vs. àbinci *dukà*
all food food all
'all the food'

Semantically, *duk(à)* differs from typical instances of universal GQs, such as *each* and *every,* in allowing for a collective construal. Same as other modified NPs, *duk(à)*-DPs can serve as antecedents for anaphoric reference across sentential boundaries. Finally, *duk(à)*-DPs do not scopally interact with negation. Under a c-commanding negation operator, they only give rise to the ¬∀-interpretation (Jaggar 2001:377). This is shown in (31):

(31) a. ***bà**-n* *karãntà* ***duk*** ***lìttàttàafâ-n*** ***ba*** [Jaggar 2001:377]
NEG-1sg read all books-DEF NEG
'I didn't read all the books.'

Taken together, the variation in word order, the absence of agreement effects, and the semantic behavior of *duk(à)*-DPs suggest that *duk(à)* is a modifying element, rather than a functional head in D. Semantically, it is similar to its English counterpart *all*, which is analyzed as a DP-modifying element in Brisson (1998). The presence of these elements effects a maximization operation over the DP-denotation by ensuring that every individual element of the DP-denotation is affected by the main predicate.

Koo-wh expressions differ from *duk(à)*-DPs in distribution and interpretation. As shown in (32), the functional *koo*-wh part must precede the nominal head and shows gender agreement. The universal interpretation of *koo*-wh expressions is illustrated in (33ab).

(32) a. *koo-wànè* *dâalìbii* 'every student'

DISJ-which student

b. *koo-wàcè* *mootàa* 'every car'

DISJ-which car

c. *koo-wàdânne* *irìn* *kaayaa* 'all kinds of clothes'

DISJ-which.PL kind clothes

(33) a. ***koo-waa*** *yaa* *ci* *jarr̃̃àbâawaa* [Newman 2000:623]

DISJ-who 3sg.PERF eat exam

'*Everyone* passed the exam.'

b. *yaa* *duubàa* ***koo-'ìnaa*** *àmmaa* *bà-i* *sàamee* *shì* *ba*

3sg.PERF look DISJ-where but NEG-3sg find him NEG

'He looked *everywhere*, but he didn't find him.' [Newman 2000:623]

In fact, linear order and agreement effects with *koo*-wh expressions are entirely parallel to those observed for existential *wani*-expressions in (23) in section 2.2.3. This suggests a unified analysis of both classes of elements, namely as inherently quantificational elements in a functional head position, which take an NP-complement and map it onto a GQ-meaning.

This analysis of *koo*-wh expressions ties in well with their semantic behavior. In particular, these expressions are inherently distributive and generally do not combine with inherently collective predicates (Jaggar 2001:370, 375), such as e.g. *tàaru* 'to gather' in (34a). In addition, *koo*-wh expressions can be modified by *kusa* 'almost', cf. (34b). According to Kadmon & Landman (1993:354), this is a characteristic property of universal quantifiers.[7]

(34) a.***koo-wànè dalìbii** *yáa* *tàaru* *à* *gàba-n* *makarantaa*

DISJ-which student 3sg.PERF gather at front-LINK school

*'Each/Every student gathered in front of the school.'

b. *Ciki-n* *shèekàru-n baayaa,* ***kusa*** ***koowànè*** ***watàa***

inside-of years-of back almost DISJ-which month

Mr. Ding Zhaozhong *kàn* *zoo* *k'asa-r* *Sin.*

Mr DZ HAB come country-of China

'In the past years, Mr Ding Zhaozhong used to come to China almost every month.'

hausa.cri.cn/1/2005/04/15/2@24550.htm - 07-12-07

To conclude, the class of inherently quantificational nominal expressions (GQs) in Hausa consists of two subgroups: *Wani*-expressions denote GQs with existential quantificational force, and *koo*-wh expressions denote GQs with universal force. In section 3, we look at the semantic analysis of these universal GQs in more detail.

2.4 Summary

Both syntactic and lexical quantification play a role in Hausa. While the bulk of quantificational expressions are analyzable as NP-modifying expressions that gain their apparent quantificational force through sentential quantification, there seem to be two kinds of inherently quantifying expressions (=GQs), which come with existential (*wani*-expressions) and universal force (*koo*-wh expressions), respectively. This makes the quantificational system of Hausa look similar to that of better-studied languages, such as English and German, which - on standard accounts - likewise exhibit a mixture of lexical and syntactic quantification in their grammatical system.

3. Cross-linguistic variation I: The interpretation of wh-DISJ expressions

This section gives a detailed semantic account of *koo*-wh expressions in Hausa, with a focus on the origin of their universal force. It is claimed that *koo*-wh expressions are morpho-syntactically and semantically complex, and that the universal force is compositionally derived by functional application of the meaning of the particle *koo* (which denotes the *join*-operator) to the meaning of its NP-complement. The compositional analysis is similar in spirit, though not identical, to the analysis of (quasi)universal FCs in Greek and Mandarin in Giannakidou & Cheng (2006).

Apart from the issue of compositionality, the analysis of *koo*-wh expressions in Hausa has to meet with two additional challenges. Language-internally, it should account for the varying interpretation of *koo*-wh expressions in different syntactic contexts, to be introduced in section 3.1. Cross-linguistically, it should provide a solution to (Q1) from section 1:

(Q1) How to explain that elements with the same morpho-syntactic structure (wh+DISJ) receive different semantic interpretations in different languages?

In particular, the analysis should explain why wh+DISJ expressions come with universal force in Hausa and Korean, but with existential force in languages of the Japanese/Malayalam-type, which are introduced in section 3.2. Sections 3.3 and 3.4, which draw extensively on Zimmermann (2005), consider two alternative approaches to the observed cross-linguistic variation in the interpretation of wh-DISJ expressions. In section 3.3, we consider and reject two possible analyses for the interpretational variability of *koo*-wh expressions in Hausa. It is shown that the variation in meaning is not the result of a lexical ambiguity. In a first attempt at a unified analysis, we then consider the possibility of treating Hausa *koo*-DISJ expressions as indeterminate pronouns in the sense of Kuroda (1965) and Kratzer & Shimoyama (2002). As indeterminate pronouns, *koo*-DISJ expressions would have no quantificational force by themselves, but project a set of alternatives to be quantified over by propositional operators in a process of syntactic quantification. This analysis accounts for the Japanese facts, but it poses some serious problems for Hausa *koo*-wh expressions. In conclusion, then, Hausa *koo*-wh expressions should be treated as genuine universal quantifiers, and section 3.3.3 shows how the different meanings observed in different syntactic configurations follow from a basic universal interpretation. In a second attempt at a cross-linguistically unified analysis, section 3.4 shows how the universal reading of *koo*-wh expressions, as well as the existential reading of wh-DISJ expressions in other languages, are derived compositionally from the meanings of their parts. In both language-types, the quantifying force is contributed by the disjunction marker itself, which is analyzed as denoting the algebraic *join*-operator (Szabolcsi 1997). Depending on whether the *join*-operator takes an NP-denotation (lexical quantification) or a sentence denotation (syntactic quantification) as its semantic argument, we obtain a universal or existential interpretation. The analysis works well for Hausa, but it proves problematic for languages of the Japanese/Malayalam-type. This leads to the tentative conclusion that the

observable cross-linguistic differences in the interpretation of wh-DISJ expressions constitute a genuine instance of *semantic variation* since they follow from the application of two different interpretive mechanisms. In Hausa, the universal interpretation follows from lexical quantification with the *join*-operator at the DP-level. This is similar in spirit to Giannakidou & Cheng's (2006) analysis of the (quasi)universal interpretation of FCs in Greek and Mandarin. In contrast, the existential interpretation of wh-DISJ expressions in Japanese and Malayalam follows from syntactic quantification with a (covert) propositional operator at the sentential level.

3.1 Variation in the interpretation of koo-wh expressions in Hausa

An important fact about the semantics of *koo*-wh expressions is that these are not always interpreted as plain universal quantifiers. Their interpretation exhibits a considerable degree of variation as they give rise to different, albeit systematically related interpretations in different syntactic contexts. (33ab) showed that the interpretation as a distributive universal quantifier is attested in episodic declarative clauses. The universal interpretation also shows up in episodic Y/N-questions, cf. (35):

(35) ***koo-waa*** *yaa* *zoo ?* [Cowan & Schuh 1976:278]

DISJ-who 3sg.PERF come

'Did everyone come?'

In addition to the plain universal interpretation, *koo+wh* expressions can receive an interpretation as a Free Choice Item (FCI), corresponding to English *any*. This reading becomes available in (inferred) intensional or modal contexts, but, crucially, it is not attested in other non-veridical contexts, such as the Y/N-question in (35) (Giannakidou 2001). In

(36a), the *koo*-wh expression is embedded under a verb of desire. In (36b), it occurs in a generic conditional '*wh*…ever'-clause.

(36) a. *ya-nàa* *sô* *yà* *sàyi* *wannàn* *kud'i-ntà* ***koo*** ***nawà***
3sg.m.PROG want 3sg.m.SUBJ buy this money-its DISJ how much
'He wants to buy this at *any* price.' [Newman 2000:623]

b. ***koo-waa*** *ya* *yi* *hakà* *waawaa* *nèe* [Newman 2000:624]
or-who 3sg.m.PERF.REL do so fool COP
'*Whoever* / *Anyone* who does this is a fool.'

The configuration in (36b), where the *koo-wh* element is modified by a relative clause, resembles instances of subtrigging with English FC *any* (LeGrand 1975). We will encounter more instances of *koo*-wh expressions in intensional contexts in section 3.3, as these constitute a crucial factor for deciding between competing analyses.

To make matters more complicated still, *koo*-wh expressions are interpreted on a (negative) existential reading when they occur under vP-negation, cf. (37a) (Newman 2000, Jaggar 2001). On this interpretation, *koo*-wh expressions resemble the English negative polarity item (NPI) *any*. This observation is particularly surprising since the negative existential reading does not correspond to the surface reading, which would be negative universal, which is unavailable for (37a). We hasten to add that the (negative) existential interpretation is restricted to the context of vP-negation alone. Under focus negation, only the expected negative universal interpretation is available for the focus-fronted *koo*-wh expression, cf. (37b).

(37) a. ***bà**-n* *ga* ***koo-waa*** ***ba***. [Newman 2000:624]

NEG-1sg see DISJ-who NEG

'I didn't see *anyone*.' or 'I saw *no-one*.'

NOT: 'I did not see everybody.'

b. ***[bàa koo-waa$_1$ ba]*** *nèe [Audu [$_{VP}$ ya kiraa t_1]]*

NEG DISJ-who NEG PRT Audu 3sg.PERF.REL call

'It is not *EVERYONE* that Audu called.'

NOT: 'Audu called NOBODY.'

Summing up, apart from the universal interpretation, *koo*-wh expressions allow for additional interpretations in particular syntactic contexts. The question is how come.

3.2 Universal and existential wh-DISJ expressions

Cross-linguistically, complex wh-DISJ expressions are interpreted in two different ways. Unlike in Hausa, the quantificational force of *wh*-DISJ expressions is not universal, but existential in Japanese (Nishigauchi 1986, 1990), Malayalam (Jayaseelan 2001), and Kannada (Amritavalli 2003). (38ab) illustrate the existential interpretation of wh-DISJ expressions in Japanese and Malayalam, respectively.

(38) a. ***dono*** *gakusei -* ***ka-*** *ga* *rakudai-si-ta* (Japanese: wh+DISJ = ∃)

which student - DISJ- NOM flunk-PAST

'*Some* student flunked.' [Nishigauchi 1990:118]

b. *n®aan=**aar**- e-* ***(y)oo*** *kaNDu* (Malayalam: wh+DISJ = ∃)

I who- ACC- DISJ saw

'I saw *some*body.' [Jayaseelan 2001]

At the same time, Hausa resembles Korean, where *wh*-DISJ expressions are also interpreted with universal force, cf. (39) (Haspelmath 1997, Gill 2004, Kim & Kaufmann 2007).[8]

(39) *Nwukwu-na* *Seoul-tay-ey* *iphakhay-ss-ta-ta* (Korean: wh+DISJ = ∀)
who-DISJ Seoul-university-goal enter-PAST-DECL
'*Everybody/Anybody* entered Seoul National University.'[Kim & Kaufmann 2007:378]

Notice that wh-DISJ expressions with universal force are not only found in Hausa, but in other Chadic languages as well, such as e.g. Margi (Hoffmann 1963), Mupun (Frajzyngier 1993), Hdi (Frajzyngier 2002), and Gùrùntùm (Haruna 2003). In addition, they are found in the Northern Nigerian variety of Fulani (Jungraithmayr & Abu-Manga 1989). In light of this, the existence of wh-DISJ expressions with a universal interpretation is not an idiosyncratic property of Hausa, but a general semantic characteristic of a group of languages that requires a principled account.

Given the superficial similarity of the expressions in question, the observed cross-linguistic variation between Japanese/Malayalam and Hausa (Chadic)/Korean is surprising. It raises the questions of how the universal reading in Hausa comes about, and whether different languages employ different strategies in the semantic composition of *wh*-expressions and disjunction markers, which give rise to different interpretations.

3.3 Lexical Ambiguity or Indeterminacy?

At first sight, the systematic correlation, pointed out in 3.1, between the syntactic context of a *koo*-wh expression (positive episodic, modal/intensional, negative) and its varying interpretation (distributive universal, free choice, (negative) existential) argues against a

unified analysis of *koo*-wh expressions as universal GQs. Two alternative analyses come to mind. First, *koo*-wh expressions could be treated as three-way lexically ambiguous between a universal, a FC, and an NPI-interpretation, in analogy to what has been proposed for FC *any* and NPI *any* in English (see Kadmon & Landman (1993) and references there for relevant discussion). Conceptually unattractive as this may be (Chierchia 2005), the distribution and interpretation of the three different lexical elements would follow from different (anti)licensing conditions. Section 3.3.1 shows that this is not a viable solution. Alternatively, one could try to derive the three different readings by treating *koo*-wh expressions as indeterminate pronouns, as proposed for Japanese by Kratzer & Shimomyama (2002). On this analysis, the quantificational force of *koo*-wh expressions would not be specified in the lexicon, and their varying interpretation in different syntactic contexts would follow from their combination with different sentential operators. Section 3.3.2 investigates this possibility and shows that it does not stand up to closer scrutiny either. The upshot of the discussion will be that the additional FC- and negative existential readings of *koo*-wh expressions systematically derive from a basic universal reading under well-defined structural conditions (section 3.3.3). Section 3.4 shows how this universal reading is compositionally derived.

3.3.1 Rejecting Lexical Ambiguity. In connection with the positive episodic sentences in (33ab), it emerged that the distribution of *koo*-wh expressions is more liberal than that of NPIs and FCI, which are mostly restricted to non-veridical (Giannakidou 2001:684) and generic contexts (Kadmon & Landman 1993) in familiar languages such as English, Greek (Giannakidou 2001), and Spanish (Menendez-Benito 2005). It follows that the three observable interpretations of *koo*-wh expressions, namely $\forall$, FC, and $\neg\exists$, cannot be derived from a basic FC-reading, at least if the FC-reading is parallel to that of FCIs in English, Romance, and Greek. Nor can all three interpretations be derived from a basic NPI-reading.

However, *koo*-wh expressions could still be taken to be lexically ambiguous between a universal reading, a FC-reading, and an existential (negative polarity) reading. The three occurrences of *koo+wh* would then be restricted to positive episodic contexts, modal contexts, and negative contexts, respectively. The behavior of *koo*-wh expressions in negative contexts and modal/intensional contexts shows that this analysis cannot be correct.

To begin with, it was already shown in (37b) that *koo*-wh expressions are not always interpreted with (negative) existential force under negation. In (37b), the *koo*-wh expression receives a universal interpretation under focus negation (Newman 2000:363). (40) illustrates the same point with the periphrastic focus negation bracketing the entire CP:

(40) ***bàa*** ***[koo-waa*** *[$_{VP}$ kèe sô-n wannàn jàr̃iidàa]]* ***ba*** [Newman 2000:624]
NEG DISJ-who PROG.REL like-of this newspaper NEG
'Not *everyone* likes this newspaper.'

The universal interpretation of (37b) and (40) strongly argues against the existence of existential NPI *koo-wh* expressions that are restricted to negative contexts. If such expressions existed, it would be far from clear what should block their occurrence under focus negation. In addition, as pointed out by a reviewer, (40) also shows that *koo-waa* is not a FCI, given that FCIs are generally bad, or at best odd with negation (Giannakidou 2001).

There is also no position that is reserved for the FC-use of *koo*-wh expressions to the exclusion of their universal interpretation. *Koo*-wh expressions can translate as *any…* or as *every…* in any modal or intensional context. This is shown for (permissive) imperatives in (41a), for verbs of wishing/wanting in (41b), and for the possibility modal auxiliary in (41c):

(41) a. *kà* *buud'è* ***koo-wàcè*** ***koofàa***

2sg.m.SUBJ open DISJ-which.f door

i. Open *any* door!

ii. Open *every* door!

b. *inàa* *sô* *ìn* *yi* ***koo-wànè*** ***aikì***

1sg-PROG want 1sg-PROG do DISJ-which.m work

i. I want to do *any* job.

ii. I want to do *every* job.

c. *a cân* *anàa* *iyaa* *kòoya-n* ***koo-wànè*** ***harshèe***

at there one-PROG can learn-of DISJ-which.m language

i. There, one can learn *any* language.

ii. There, one can learn *every* language (of those that are on offer).

= It is possible for one and the same person to sign up for all language courses.

Crucially, *koo*-wh expressions in intensional contexts do not show any quantificational variability (QV) effects, which is taken to be a characteristic property of FCIs in Giannakidou (2001). The absence of QV effects thus argues against the existence of FCI *koo*-wh expressions that would be restricted to modal contexts.[9] Rather, the ambiguity between ∀-reading and FC-reading in (41a-c) seems to follow from a scopal ambiguity between the universal quantifier *koo+wh* and the modal element (see section 3.3.3). Based on the foregoing observations, we conclude that the ambiguities observed with *koo*-wh expressions in Hausa do not follow from an inherent lexical ambiguity of these elements.

3.3.2 Rejecting the Indeterminate Account. A different approach to the phenomenon of *koo*-wh expressions is to treat them as indeterminate pronouns in the sense of Kuroda (1965), and

more recently Shimoyama (2001), Kratzer & Shimoyama (2002) and Kratzer (2003), as briefly sketched in section 2.2.1. Kratzer and Shimoyama analyze Japanese indeterminate pronouns as having no quantificational force by themselves. Instead, as indeterminate expressions they introduce sets of individual alternatives that expand Hamblin-style to the propositional level. The propositional alternatives are then quantified over by the *closest* c-commanding quantifier. Quantifiers can be individual-quantifiers at the DP-level, i.e. generalized quantifiers quantifying over sets of alternative individuals, or *propositional quantifiers* at the sentence level quantifying over sets of alternative propositions. Consider again the propositional universal quantifier from (11a), repeated as (42):

(42) $\forall_p(A) = 1$ iff every proposition in the set of alternative propositions A is true.

To see how the indeterminate account works, we briefly consider the Japanese indeterminate pronoun *dare* 'person'. Depending on which kind of propositional quantifier this expression combines with, it will give rise to the different interpretations in (43). It is worth pointing out that – unlike *koo*-wh expressions in Hausa - Japanese indeterminate pronouns are unselective in the sense that they can combine with different propositional operators.

(43) a. Q … [… *dare*…] → who

b. Neg … [… *dare*…] → nobody

c. ∀ … [… *dare*…] → everybody

d. ∃ … [… *dare*…] → somebody

At first sight, it seems feasible to extend this analysis of Japanese indeterminate pronouns to *koo*-wh expressions in Hausa by making the following plausible assumptions: (i.) *koo*-wh

expressions have no quantificational force by themselves, but introduce a set of individual alternatives; (ii.) the existence or relevance of these alternatives is indicated by the presence of the disjunction marker *koo*, in line with much current research on *or* (see. e.g. T.E. Zimmermann 2000, Geurts 2005, Simons 2005, Alonso-Ovalle 2004, 2005, 2006); (iii.) the set of alternatives thus arrived at is syntactically quantified over by means of different overt or covert propositional operators, which give rise to the different interpretations in (44):

(44) a. (∀) … […*koo-wh*…] → everybody = distributive universal, cf. (33ab)

b. Neg … […*koo-wh*…] → nobody = (negative) existential, cf. (37a)

c. (∀)(Exh)Mod … […*koo-wh*…] → anybody = FC-reading, cf. (36ab)

A closer look reveals that the analysis of Hausa *koo*-wh expressions as unselective indeterminate pronouns faces with a number of problems, though. First, the default interpretation of *koo*-wh expressions in sentences without an overt propositional operator (i.e. in affirmative episodic sentences) is universal and not existential. So, one would have to stipulate that *koo*-wh expressions in episodic sentences must associate with a covert propositional quantifier with universal force. Analyses along these lines have been proposed for the Spanish FCI *cualquiera* by Menendez-Benito (2005) and for English *any* by Aloni (2007). We will return to this analytical possibility in section 4. The second problem for a treatment of *koo*-wh expressions as *unselective* indeterminate pronouns is the existence of systematic gaps. Unlike what we find with indeterminate pronouns in Japanese, *koo*-wh expressions are never bound by the question-operator, i.e. they never function as *wh*-expressions in *wh*-questions. Nor do we ever find them with plain existential force in positive sentences. Third, as shown in connection with (41), we do not find quantificational variability effects with *koo*-wh expressions in modal/intensional contexts. As shown above, *koo*-wh

expressions can be translated as 'any' or 'every' in any modal/intensional context, irrespective of the quantificational force of the modal (Giannakidou 2001). Again, this suggests that *koo*-wh expressions come with (universal) quantificational force of their own. The strongest argument against treating *koo*-wh expressions as *unselective* indeterminate pronouns comes from their behavior under focus negation, though. This has already been discussed in connection with (37b) and (40), which are repeated as (45ab):

(45) a. ***[bàa koo-waa$_1$ ba]*** *nèe [Audu [$_{vP}$ ya kiraa t$_1$]]*

NEG DISJ-who NEG PRT Audu 3sg.PERF.REL call

'It is not *EVERYONE* that Audu called.'

b. ***bàa [koo-waa*** *[$_{vP}$ kèe sô-n wannàn jàr̃iidàa]]* ***ba***

NEG DISJ-who PROG.REL like-of this newspaper NEG

'Not *EVERYONE* likes this newspaper.' [Newman 2000:624]

If the *koo*-wh expression *koowaa* in (45ab) had no quantificational force by itself, and if its quantificational force were dependent on the closest c-commanding quantifier, it should be interpreted as a negative existential quantifier corresponding to *nobody*, The fact that it is not constitutes strong evidence against an analysis of *koo*-wh expressions in Hausa as unselective indeterminate pronouns, which are unspecified for quantificational force.

3.3.3 Koo-wh expressions as universal quantifiers. Having discarded the ambiguity hypothesis and the hypothesis that *koo*-wh expressions are lexically unspecified for their quantificational force, we conjecture that these expressions come with a basic universal interpretation.[10] It remains to be shown how the observable surface readings (∀, FC, ∃) can be derived from this basic universal reading in a systematic fashion.

The basic universal interpretation shows up in positive episodic declaratives and questions, as e.g. in (33a) and (35), repeated as (46ab):

(46) a. ***koo-waa*** *yaa* *ci* *jarr̃̃àbâawaa* [Newman 2000:623]

DISJ-who 3sg.PERF eat exam

'*Everyone* passed the exam.'

b. ***koo-waa*** *yaa* *zoo ?* [Cowan & Schuh 1976:278]

DISJ-who 3sg.PERF come

'Did *everyone* come?'

We turn to the FC-interpretation in modal/intensional contexts next. If *koo*-wh expressions are universal quantifiers, and not FCIs, their different interpretations in (41a-c) will follow from differences in their scopal relations with the modal/intensional operator. Consider (41c), repeated as (47), where the *koo*-wh expression is embedded under the possibility modal *iyaa* 'can'. If the universal quantifier scopes over the modal/intensional operator at LF, the resulting reading resembles a FCI-reading, cf. (47'i), and the *koo*-wh expression is best translated as *any*-. However, if it takes scope under the modal/intensional operator, the basic universal reading shows up, cf. (47'ii).

(47) *a cân* *anàa* ***iyaa*** ***kòoya-n koo-wànè*** *harshèe*

at there one-PROG can learn-of DISJ-which.m language

(47') i. $\forall z$ [language'(z) $\rightarrow$ **$\exists$w [**R(w,w_0) $\wedge$ $\exists$x [person'(x,w) $\wedge$ learn'(x, z, w)]]]

= For each language z, there is a world w accessible from w_0 such that a person in w learns z in w ($\approx$ (41ci))

ii. $\exists$**w** [R(w,w_0) $\wedge$ $\exists$x [person'(x, w) $\wedge$ $\forall$z [language'(z) $\rightarrow$ learn'(x, z, w)]]]

= There is a world w accessible from w_0 such that a person in w learns *every* language in w ($\approx$ (41cii))

Finally, the negative existential interpretation of *koo*-wh expressions under vP-negation, as in (37a), repeated as (48a), follows from the semantic nature of these expressions as universal generalized quantifiers of type <et,t> (see section 2.3), and from the fact that negation applies at the vP-edge. Following May (1985) and Fox (2000), let us assume that *koo*-wh expressions must quantifier-raise (QR) out of the vP at LF, in order to avoid a type mismatch. Let us further assume that *koo*-wh expressions automatically cross the vP-level negation when they undergo QR. The resulting LF-structure is shown in (48b). After QR has applied, the universal quantifier takes wide scope over negation, which gives rise to the desired negative existential intepretation in (48c).

(48) a. ***bà****-n* *ga* ***koo-waa*** ***ba*** [Newman 2000:624]

NEG-1sg see DISJ-who NEG

b. ***koowaa*** $_1$ *[bà-n [ga* $\boldsymbol{t_1}$ *] ba]*

c. 'For every person x, I did not see x.' = 'I did not see anybody.'

That the *koo*-wh cannot adjoin to vP below negation (*pace* Fox 2000) seems to follow from the specific syntactic structure of Hausa vP-negated sentences. We take the extended verbal projection in Hausa to contain a vP (Chomsky 1995), which also encodes aspectual information. Since the subject pronoun expresses person and aspectual information it can be assumed to originate in Spec,vP, while the preceding negative marker *bà* is the head of NegP. Crucially, the negation marker and the subject pronoun are two head-like elements that form a

close morpho-syntactic unit at surface structure, presumably after a process of incorporation (Baker 1988). The resulting surface is shown in (48d)

(48) d. [$_{NegP}$ bà+n$_i$ [$_{vP}$ t$_i$ ga$_2$ [$_{VP}$ t$_2$ koowaa]] ba]

By assumption, the *koo*-wh expression must not intervene between the incorporated head and its trace, nor may it split up the complex expression itself. It follows that the first possible propositional adjunction site is NegP. The assumption that *koo*-wh expressions raise across negation via QR is further motivated by the behavior of other *koo*-expressions, such as *koo kàdan* 'at all' (lit. 'even a little'). These expressions occur in negative contexts with a negative existential interpretation, but they occur outside the scope of negation in overt syntax, as illustrated in (48e) (Jaggar, in press):

(48) e. *bàn san shì ba* ***koo kàdan*** [Ma Newman 1990:8]

NEG-1sg know 3sg NEG DISJ a little

'I don't know him at all.'

Comparing (48e) with (48a) one finds that the only difference lies in the relative surface scope of negation and *koo*-expression. The different surface positions of the *koo*-expressions involved can be plausibly attributed to their different syntactic function as direct object, which must be adjacent to the verb, in (48a) and as adjunct (no adjacency) in (48e). Finally, as pointed out by a reviewer, the assumption that *koo*-wh expressions obligatory raise across (vP-)negation at LF is supported by cross-linguistic evidence, namely by the behavior of Greek n-words. As argued in Giannakidou (2000:457), these can be analyzed as "polarity

sensitive universal quantifiers which need negation in order to be licensed, but must raise above negation in order to yield the scoping ∀¬".[11]

In contrast to vP-internal occurrences of *koo*-wh expressions, these elements do not have to raise via covert QR when they are located outside the vP in overt syntax (e.g. after focus fronting). As a result, the sentences in (45ab), where the *koo*-wh expression appears in the scope of sentential focus negation but outside the vP, display the expected negative universal interpretation.[12]

In conclusion, the analysis of *koo*-wh expressions as universal quantifiers allows for a unified account of their different semantic interpretations in different structural configurations. The next section shows how the basic universal interpretation of *koo*-wh expressions is derived from the meaning of their parts.

3.4 A unified syntactic analysis of wh-DISJ expressions: The Operator Account

This section puts forward a unified compositional account of the universal meaning of *koo*-wh expressions in Hausa, and of the existential interpretation of wh-DISJ expressions in other languages. The two central ideas are (i.) that the disjunction marker is semantically interpreted as the Boolean *join*-operator, and (ii.) that this *join*-operator is interpreted in different positions in different languages. In section 3.4.1, it is argued that the universal force of Hausa wh-DISJ expressions is the result of locally composing the *join*-operator denoted by the disjunction marker *koo* with a set of alternatives denoted by the wh-expression. This *operator account* provides the basis for a unified cross-linguistic analysis. It extends to wh-DISJ expressions with existential interpretation in other languages, such as e.g. Japanese, Malayalam and Kannada, given the additional assumption that in these languages the disjunction marker operates at the clausal level at LF (section 3.4.2). Depending on whether the join-operator combines directly with the *wh*-expression (Hausa) or with the clause

containing the *wh*-expression (Japanese, Malayalam), the different LFs give rise to a universal or existential reading. The observed cross-linguistic variation in the interpretation of wh-DISJ expressions is thus reduced to an instance of syntactic variation. So all seems to be well.

However, this conceptually attractive result is questioned in the concluding subsection 3.4.3, which compares the operator account with the indeterminate account from section 3.3.2. Taking up a discussion from 3.3.2, it is argued once more that the unselective indeterminate account, which may well be the optimal analysis for Japanese (and possibly for Malayalam) (Kratzer & Shimoyama 2002), does not extend to Hausa *koo*-wh expressions, which are better analyzed as containing a *join*-operator. Conversely, an application of the operator account to Japanese and Malayalam necessitates the problematic assumption that the disjunction marker covertly raises to the clausal level in these languages. Given that the indeterminate account seems most adequate for Japanese and Malayalam, and given that the operator account is most adequate for Hausa, we are faced with a case of genuine semantic variation. Different languages make use of different interpretive mechanisms in the interpretation of wh-DISJ expressions: In Japanese and Malayalam, these are indeterminate pronouns that are quantified over by an existential propositional operator. In Hausa, their denotation contains the *join*-operator, which locally combines with the denotation of the *wh*-expression. As a result, *koo*-wh expressions are interpreted with universal force.

3.4.1 The Operator Account for Hausa (∀): Local Composition. The present analysis is based on the analyses of Japanese by Nishigauchi (1990) and Malayalam by Jayaseelan (2001). *Wh*-DISJ expressions in both languages were shown to be interpreted with existential force in section 3.2, unlike their counterparts in Hausa and Korean. Combined, the analyses of Nishigauchi and Jayaseelan make the following four assumptions (plus a fifth one to be discussed in section 3.4.2):

(49) i. *Wh*-expressions denote variables;

ii. *Wh*-expressions are inherently focused;

iii. Focus induces a set of alternatives;

iv. The disjunction marker denotes a (focus-sensitive) Boolean operator

We adopt the assumptions in (49i) to (49iv) in our operator analysis of *koo*-wh expression in Hausa. First, following Jayaseelan (2001), we take *wh*-elements to denote a variable, more precisely a set variable X (Cooper 1983, Jacobson 1995, Sternefeld 2001), cf. (50a).[13] Second, *wh*-expressions in Hausa are inherently focused (Rooth 1985, Beck 2006). Third, the focus value of a *wh*-expression is the range of possible alternative values for X, cf. (50b). Fourth, the focus-sensitive disjunction marker *koo* denotes the Boolean operation *join*, cf. (50c). Crucially, if this *join*-operator applies to a set (of sets), as in (50b), the result is the big set union of this set (Szabolcsi 1997), cf. (50d):

(50) a. $[[\text{who}]]^0$ = X, such that $\forall x \in X$: x a person

b. $[[\text{who}]]^f$ = {{musa}, {musa, hawwa}, {audu, hawwa} …}

c. [[koo]] = $\lambda X.\ \textit{join}[[X]]^f$

d. $[[\text{koo + who }]]^0$ = $\cup[[\text{who}]]^f$ = {{m}∪{m, h}∪{a, h}∪...} = {{m, h, a,…}}

The *local composition* of *join*-operator and wh-denotation in (50d) is the crucial part of the operator analysis of *koo*-wh expressions in Hausa, which sets them apart from existential wh-DISJ expression in other languages. As shown in (50d), the local composition of *koo* and the w*h*-expression leads to the formation of the set union of all alternative values for X, resulting in universal quantification over the domain of individuals in the domain.

Notice that the denotation in (50d) does not contain anything but person individuals. Strictly speaking, it would thus correspond to the meaning of the natural language expression *each and only each*, with truth-conditions stronger than those typically found with *koo*-wh expressions. In order to solve this problem, one could assume that the set in (50d) only specifies the minimal witness set (cf. Szabolcsi 1997) of the universal quantifier, from which the actual denotation is derived. The additional interpretive step does not directly follow from the semantics of the individual parts, nor from their composition. But since *koo*-wh expressions appear to form lexical (hence: semantic) units, we assume that this additional semantic operation takes place in the lexicon. This extra assumption makes the operator-analysis of the universal GQ-interpretation of *koo*-wh expressions deviate slightly from the ideal of full compositionality, a fate it shares with the analyses of FCIs in Giannakidou & Cheng (2006:151) and NPIs in Lahiri (1998:59), which also attribute certain semantic properties of these expressions to their special status as lexicalized expressions.

The result of the semantic derivation in (50d) is of semantic type <et,t>, the type of standard GQs. As GQs, *koo*-wh expressions are not collective expressions denoting the total set of individuals in the NP-domain. This accounts for the observation from section 2.3 that *koo*-wh expressions are semantically distributive. Consider again the incompatibility of the *koo*-wh subject in (51) with the collective verb *tàaru* 'to gather':[14]

(51) ***koo-wànè dialìbìi** *yáa tàaru à gàba-n makarantaa*

DISJ-which student 3sg.m.PERF gather at front-of school

'Each student gathered in front of the school.'

Summing up, the local operator analysis of *koo*-wh expressions in (50) accounts for their interpretation as universal GQs of type <et,t> in an (almost) compositional way. Furthermore,

this analysis of *koo*-wh expressions as universal GQs accounts for their observed semantic behavior, in particular for their inherent distributivity and for their ability to undergo QR (see 3.3.3). Their universal force comes about by locally combining the Boolean operator *join* denoted by *koo* with the focus value of the *wh*-expression. If correct, the proposed account also has consequences for the semantic analysis of seemingly indeterminate *wh*-expressions in general, for it shows that at least some complex nominal expressions built around a *wh*-core can, or even should be analyzed as generalized quantifiers, and not in terms of propositional quantification.

3.4.2 The Operator Account for Japanese/Malayalam (∃): Association at a Distance. In section 3.2, wh-DISJ expressions in Japanese, Malayalam and Kannada were shown to differ from their Hausa counterparts in that they are interpreted with existential force. The relevant examples from Japanese and Malayalam are repeated in (52ab).

(52) a. ***dono gakusei - ka-*** *ga* *rakudai-si-ta* (Japanese: wh+DISJ = ∃)
which student - DISJ- NOM flunk-PAST
'*Some* student flunked.' [Nishigauchi 1990:118]

b. *n®aan=**aar-*** *e-* ***(y)oo*** *kaNDu* (Malayalam: wh+DISJ = ∃)
I who- ACC- DISJ saw
'I saw *some*body.' [Jayaseelan 2001]

This section shows that the operator account can be extended to existential *wh*-DISJ expressions, given the additional assumption in (53), cf. Jayaseelan (2001):

(53) In Malayalam (and Japanese), the disjunction marker is a disjunctive connective that applies at a distance to the meaning of the focused *wh*-expression (e.g. by means of association with focus);

A natural way of interpreting (53) is to assume that the *join*-operator in these languages does not apply locally at the DP-level, as in Hausa, but at the clausal level. In this position, the *join*-operator applies to a set of alternative proposition, which results in (infinite) disjunction (Szabolcsi 1997).[15] Given this additional assumption, the analysis of the Malayalam sentence (52b) proceeds as shown in (54). The alternatives invoked by the *wh*-expression in (54a) project to the level of alternative propositions in (54b). The *join*-operator then applies to this set of alternative propositions as shown in (54c). Notice in particular that disjunction at the propositional level is equivalent to existential quantification over the *wh*-variable and therefore gives rise to the existential reading in (54d) (Krifka 2001).

(54) a. $[[\text{who}]]^f$ = {bill, peter, joanna+peter}

b. $[[\text{ I who saw}]]^f$ = {I saw Bill, I saw Peter, I saw Joanna and Peter}

c. [[I who saw DISJ]] = 1 iff I saw Bill $\vee$ I saw Peter $\vee$ I saw Joanna and Peter

d. $\Leftrightarrow$ I saw somebody

Summing up, the operator account allows for a unified syntactic analysis of the observed cross-linguistic variation in the interpretation of wh-DISJ expressions. The crucial difference between the semantic derivation of Japanese and Malayalam wh-DISJ expressions in (54) and their Hausa counterparts in (50) concerns the structural relation of the Boolean operator and the *wh*-expression. Unlike their Hausa counterparts, which combine locally at the NP-level, the two items combine at a distance in Japanese and Malayalam:

(55) *Syntactic variation: same interpretive mechanism, but compositional differences*

a. Hausa, Korean: local composition of DISJ+wh

→ application of join-operator at NP-level leads to set union and universal quantification

b. Japanese, Malayalam: DISJ and *wh* combine at a distance:

→ application of join-operator at propositional level leads to disjunction of open propositions and thence to existential quantification (Krifka 2001, Jayaseelan 2001).

3.4.3 Operator Account vs. Indeterminate Pronouns: Semantic Variation? The preceding section has put forward a unified cross-linguistic analysis of *wh*-DISJ expressions. On this analysis, the disjunction marker denotes the Boolean *join*-operator, whence the label *operator account*. The cross-linguistic difference in the interpretation of *wh*-DISJ-quantifiers was reduced to a structural difference concerning the point of application of this operator. Local application (at the NP-level) to the denotation of a *wh*-expression results in universal quantification (Hausa), cf. (56a). Application at a distance, i.e. at the propositional level, results in existential quantification (Malayalam, Japanese) (56b).

(56) a. [wh-$Op_{\vee}$] $\Rightarrow$ $\forall$ (Hausa)

b. [$_{prop}$ [wh] …] $Op_{\vee}$] $\Rightarrow$ $\exists$ (Japanese, Malayalam)

Now, how does this analysis compare with the analysis of wh-DISJ expressions in Japanese as indeterminate pronouns, which was introduced in section 3.3.2? At first sight, the analysis in

(56b) appears compatible with the indeterminate account. The only difference – or so it seems – would affect the semantic nature of the clause-level operator, which is a *join* operator on the present account, but a propositional existential quantifier $\exists_p$ on the indeterminate account.

On closer inspection, though, the indeterminate account differs more fundamentally from the analysis presented here. First, it cannot serve as the basis for a unified cross-linguistic analysis because it does not directly extend to Hausa: Substitution of a DP-level existential quantifier for the *join* operator in (56a) would give rise to an *existential* interpretation and not to the *universal* interpretation, which is actually observed. Second, the two analyses differ in their treatment of the disjunction marker itself. The latter is not treated as operator-denoting on the indeterminate account. Instead, it can be either analyzed as marking the existence of alternatives introduced by the indeterminate pronoun (see section 3.3.2 and references therein). Alternatively, one can treat the disjunction marker as semantically vacuous and merely serving as a marker of quantificational agreement (Kratzer 2004). In Japanese and Malayalam, its presence on the indeterminate pronoun in (56b) would then indicate that the closest potential quantifier over the Hamblin-alternatives is an existential quantifier.

Conversely, an extension of the operator account from Hausa to Japanese and Malayalam is not without problems either. As already noted in n.15, the biggest obstacle for a unified cross-linguistic operator account is the assumption that the disjunction marker is located in the clausal periphery at LF in Japanese and Malayalam, from where it can operate over propositions. If it is correct that the disjunction marker is not located in the clausal periphery in these two languages (see Jayaseelan 2001 and Nishigauchi 1990 for discussion), we are led to the conclusions that the account in terms of indeterminate pronouns and covert propositional quantifiers is in fact more adequate for this type of languages.

But if the indeterminate account is the most adequate analysis for Japanese (and possibly for Malayalam), and if the operator account is the most adequate account for Hausa, this

means that it may not be possible after all to come up with a cross-linguistically unified semantic analysis of *wh*-DISJ expressions. Neither account seems to extend to the other language type without incurring some serious problems. If so, we are forced to conclude that the languages of the world make use of two different strategies for the interpretation of *wh*-DISJ expression: (i.) an *operator strategy*, on which the quantificational force is located within the *wh*-DISJ expression, provided by the disjunction marker in form of a *join*-operator; and (ii.) an *indeterminate strategy*, on which the *wh*-DISJ expression has no quantificational force and the disjunction marker is analyzed as a marker of alternatives, or a quantificational agreement marker. In other words, here we seem to have a genuine instance of semantic variation, as sketched in (57):

(57) *Semantic variation: Different interpretive mechanisms in different languages*

a. Hausa:	operator account	(lexical quantification)
b. Japanese:	indeterminate pronoun	(syntactic quantification)

The situation in (57) is rather more in line with Haspelmath's (1997) pessimistic view that a unified cross-linguistic analysis for the interpretation *wh*-DISJ-quantifiers is not feasible.

3.5 Conclusion

The analysis of Hausa *koo*-wh expressions as lexical universal quantifiers accounts for their different interpretations (∀, FC, ¬∃) in different structural configurations. The universal GQ-reading of *koo*-wh expressions derives compositionally from its parts on the assumption that the disjunction marker denotes the Boolean *join*-operator. This is the operator account. The *join*-operator takes a set of sets of individuals as its argument and yields their big set union as its output. The formation of set union is reminiscent of, though not identical to the

maximization procedure in Giannakidou & Cheng's (2006) account of the (quasi)universal interpretation of FCIs in Greek and Mandarin Chinese. Their, maximization is attributed to the working of an *tota*-operator in the semantic representation of the FCI.

As for the observed cross-linguistic variation, the operator account can be extended to languages with existential wh-DISJ expressions (Japanese, Malayalam), at least in principle. However, the operator account seems empirically less adequate for this type of languages than the alternative account in terms of unselective indeterminate pronouns, as proposed in Kratzer & Shimoyama (2002). Conversely, an account in terms of unselective indeterminate pronouns is problematic for *koo*-wh expressions in Hausa. These considerations gave rise to the tentative conclusion that wh-DISJ expressions are interpreted by different interpretive mechanisms in different languages, in spite of their parallel morpho-syntactic structure. Wh-DISJ expressions in Hausa are interpreted as universal GQs, i.e. as lexical quantifiers, whereas their counterparts in Japanese and Malayalam are interpreted as indeterminate pronouns that are syntactically quantifier over by a covert existential quantifier.

Of course, given the observed cross-linguistic parallels in the morpho-syntactic structure of wh-DISJ expressions, one should not give up on a unified account of these expressions too easily. For this reason, we briefly consider, but ultimately reject, a third possible analysis of *koo*-wh expressions as *selective* indeterminate pronouns in section 4. The analysis is motivated by a number of interesting parallels between *koo*-wh expressions in Hausa and FCIs in other languages. Given that the analysis as (selective) indeterminate pronouns seems to work for wh-DISJ expressions in Japanese and Malayalam, and in light of the fact that FCIs have recently been analyzed as selective indeterminate pronouns occurring in the scope of a covert universal quantifier (Menéndez-Benito 2005, Aloni 2007), we reconsider the question of whether an analogous analysis as *selective* indeterminate pronouns may not be an option for Hausa *koo*-wh expressions after all.

4. Cross-Linguistic Variation II: The Expression of Free Choice

This section discusses in some more detail the FC-interpretation of *koo*-wh expressions, which sets them apart from universal quantifiers of the English *every*-type. Free choice is here understood as domain widening in the sense of Kadmon & Landman (1993), Kratzer & Shimoyama (2002), Chierchia (2005), among others. After domain widening, a nominal expression does not only range over all individuals with the NP-property in the actual domain of evaluation (e.g. the actual world), but over all individuals with the NP-property in all possible domains of evaluation.

As explicated in section 3.1, *koo*-wh expressions in Hausa are not always interpreted as regular universal quantifiers. In certain structural configurations, they allow for a free choice interpretation as well. This ties in with the fact that there is no distinct lexical class of FCIs in Hausa.[16] In other words, the class of *koo*-wh expressions in Hausa is used to express two related, but different semantic concepts, that is regular universal quantification and free choice domain widening, which are frequently realized in form of different lexical elements in other languages: In English *each* and *every* are interpreted as a regular universal quantifiers, while the FCI *any* gives rise to a free choice reading, cf. (58ab):

(58) a. Every / *Any student cheated in the final exams.

b. Any student cheats in the final exams.

The cross-linguistic variation thus concerns the question of whether two seemingly different semantic concepts are expressed by one and the same lexical element, as in Hausa, or by different lexical elements, as in English. This gives rise to research question (Q2).

(Q2) What is the nature of cross-linguistic variation in the expression of Free Choice?

Additional questions that arise are: Which semantic factors block *every/each* from functioning as FCIs in English? And what analysis of universally quantifying elements can account for the fact that these double as FCIs in languages with no distinct FC-expressions?

4.1 Similarities between koo-wh expressions and FCIs

The assumption of a deeper semantic relation between *koo*-wh expressions and FCIs is motivated by two striking parallels between these expressions. First, like English *any*, *koo*-wh expressions occur in generic statements, where they contribute the free choice flavour of domain widening. This is illustrated in (59ab). Parallel facts obtain for Korean, where the universal quantifier also allows for a FC-interpretation, cf. (39).

(59) a. ***koo-waa*** *ya* *yi* *hakà* *waawaa* *nèe* [=(36b)]
DISJ-who 3sg.m.PERF.REL do so fool COP
'*Whoever* / *Anyone* / *Everyone* who does this is a fool.'

b. ***koo-ʻìnaa*** *ka* *shuukàa,* *sai* *kà* *tsarè* *wurî-n*
DISJ-where 2sg.m plant PRT 2sg.m.SUBJ protect place-DEF
'Wherever you plant, you must protect the place.'

Notice that the Hausa relative construction in (59a) is structurally parallel to the English subtrigging construction with *whoever* or *anyone* in the paraphrase. Nonetheless, the presence of the relative clause is motivated by slightly different factors in the two languages. While the insertion of the relative clause (subtrigging) in English is a repair strategy which licenses the presence of FCIs in clauses that would otherwise be ungrammatical, sentences with *koo*-wh

expressions are grammatical with or without the additional relative clause in Hausa. However, in line with the argumentation in Menendéz-Benito (2005:205), we assume that the addition of a relative clause can turn an episodic statement into a more generic one in both languages. In Hausa, then, it is this change from episodic to generic context, which often motivates a shift in interpretation from plain universal, where the *koo*-wh expression is interpreted relative to a concrete situation/world, to free choice, where the *koo*-wh expression is evaluated relative to any situation/world that is compatible with the normal course of events in the actual world. The domain widening observed in (59) thus follows from the interaction of the universal *koo*-wh expression with a (covert) genericity operator (see section 3.3.3).[17]

The second parallel between *koo*-wh expressions and FCIs concerns their internal structure. Recall from the introduction that *koo* also functions as a scalar particle corresponding to *even*, so that one could analyze *koo*-wh expressions as consisting of a scalar particle and an indefinite wh-expression. Interestingly, this is the very structure of FCIs in Hungarian, cf. (60) from Abrusán (2007):[18]

(60) ***akár-ki*** *eljöhet*
even-who come-may
'Anyone may come.'

Summing up, *koo*-wh expressions and FCIs display some interesting parallels in their interpretation (domain widening), their distribution (in generic statements with relative clauses) and their internal structure. These parallels point to a deeper semantic relation between *koo*-wh expressions and FCIs. At the same time, we should not lose sight of the most important difference between *koo*-wh expressions and FCIs, which is that *koo*-wh expressions have a much wider distribution than FCIs (section 3.3.1). In particular, *koo*-wh expressions

are licensed in episodic sentences, where they are typically interpreted as regular universal quantifiers. Any analysis that attempts to account for the observed parallels between *koo*-wh expressions and FCIs must also account for this important difference in distribution.

4.2 The analysis of FCIs as selective indeterminate pronouns

Among the many analyses of FCIs in the literature (see the end of section 1 for a non-exhaustive list of references), which offer a variety of approaches to the phenomenon of FCIs (definite/quantifier vs. indefinite NP, existential vs. universal force), there are two recent analyses in Menèndez-Benito (2005) and Aloni (2007) which appear particularly relevant to an analysis of Hausa *koo*-wh expressions as selective indeterminate pronouns. Both analyses treat FCIs as selective indeterminate pronouns, i.e. as a special kind of indefinite expressions, which occur in the semantic scope of a covert exhaustive operator and a covert universal propositional quantifier, in this order. For illustration, consider the ungrammatical sentence in (61a) with the LF-representation in (61b).

(61) a. ***Anybody** jumped.

b. [$\forall_p$ … [Exh … [anybody $_{FCI}$ jumped]]]

As an indeterminate pronoun, the FCI *anybody* denotes the set of alternative individuals in the domain, say d1 and d2, cf. (62a). This set combines with the verb denotation and projects Hamblin-alternatives to the propositional level, as explicated in Kratzer & Shimoyama (2002), cf. (62b). Next, the exhaustive operator applies to this set of alternative propositions and turns it into a set of mutually exclusive alternative propositions, cf. (62c). Notice that only one of these mutually exclusive propositions can ever be true in a given situation. Finally, the propositional universal quantifier applies to this set of mutually exclusive propositions, which

necessarily leads to a contradiction: In order for the sentence to be true, all alternative propositions in the scope of the universal quantifier must be true. This requirement is in direct conflict with the presence of the exhaustive operator, which ensures that only one of the alternative propositions can be true in a given world of evaluation.

(62) a. [[anybody]] = {d1, d2}

b. [[anybody jumped]] = {d1 jumped, d2 jumped}

c. [[Exh anybody jumped]] = {d1 jumped and nobody else jumped, d2 jumped and nobody else jumped, d1 and d2 jumped and nobody else jumped}

d. [[$\forall_p$ Exh anybody jumped]] = necessarily false → ungrammatical

In effect, then, it is the exhaustive operator which is responsible for the ungrammaticality of FCIs in episodic sentences. Sentence (61a) can never be true in virtue of its logical structure and is therefore ungrammatical according to Gajewski (2002) and Menéndez-Benito (2005).[19]

The same line of reasoning accounts for why FCIs are licensed in the context of possibility modals, as shown in (63a) with the LF in (63b). The semantic derivation of (63) is identical to that of (61) up to the point where the set of mutually exclusive propositions generated by the exhaustive operator combines with the possibility modal, thus yielding (64):

(63) a. Anybody can jump.

b. [$\forall$ … **can** [Exh … [anybody $_{FCI}$ jump]]]

(64) {it is possible that d1 jumped and nobody else jumped, it is possible that d2 jumped and nobody else jumped, it is possible that d1 and d2 jumped and nobody else jumped}

The reader may verify for herself that the presence of the possibility modal in (63) ensures that all alternative propositions can be simultaneously true in a given world of evaluation. Similar explanations account for the other licit syntactic positions of FCIs in Spanish and English (see Menéndez-Benito 2005, Aloni 2007). Now, assuming that the analysis of FCIs as selective indeterminate pronouns is correct, one may wonder about its implications for the analysis of *koo*-wh expressions in Hausa.

4.3 Koo-wh expressions as selective indeterminate pronouns?

The languages of the world differ as to whether or not they exhibit a formal difference in the expression of universal quantification and free choice (Haspelmath 1997, Aloni 2007). Languages of the English type have two kinds of lexical elements with a different distribution and a different semantic interpretation. The universal quantifying expressions *each* and *every* express regular universal quantification. They are (almost) unrestricted in their syntactic distribution, and they are plausibly analyzed as universal GQs. Most importantly, they contrast with the FCI *any*, which expresses free choice, which is restricted in its syntactic distribution, and which can be arguably analyzed as a selective indeterminate pronoun that is c-commanded by a covert exhaustive operator and a covert universal propositional quantifier. As argued in 4.2, the restricted syntactic distribution of FCI *any* follows from the interaction of these two covert operators.

Languages like Hausa (and Korean), in contrast, do not exhibit a formal difference between regular universal quantifiers and quantifying elements with a free choice interpretation. In these languages the classes of FCIs and distributive universal quantifiers fall together. There is only one class of *koo*-wh expressions which are (almost) unrestricted in their syntactic distribution. The situation is schematized in (65):

(65) i. *English:* **each, every** (∀, unrestricted) ⇔ **any** (FC, restricted)

⇒ GQ ⇒ ∀ + exh + indeterminate

ii. *Hausa:* ***koo*-wh expressions** (∀/FC, unrestricted)

Since Hausa *koo*-wh expressions neutralize the distinction between GQ *each/every* and FC *any*, there are a priori two possibilities for their semantic analysis. Section 3 put forward an analysis of *koo*-wh expressions as universal GQs in analogy to English *each/every*-DPs, and in line with analyses of FCIs as (in)definite DPs with universal force in Dayal (1998, 2004) and Giannakidou & Cheng (2006). As shown in sections 3.3 and 3.4, the GQ-analysis accounts for the semantic interpretation and syntactic distribution of *koo*-wh expressions in Hausa, but it does not lend itself easily to a unified cross-linguistic analysis of wh-DISJ expressions. Because of this, let us then consider once again the alternative approach to *koo*-wh expressions as selective indeterminate pronouns under a covert universal quantifier. This analysis has the advantage of allowing for a more unified treatment of wh-DISJ expressions as indeterminate pronouns cross-linguistically (see section 3.4.3).

Obviously, a FCI-style analysis of *koo*-wh expressions as selective indeterminate pronouns under ∀ will have to differ from the analysis of English or Spanish FCIs in one important respect. Unlike English or Spanish FCIs, *koo*-wh expressions in Hausa are not restricted in their syntactic distribution. In section 4.2, the relevant factor for the limited syntactic distribution of FCIs proper was shown to be the presence of an exhaustive operator between indeterminate pronoun and universal quantifier in the semantic representation. It follows that, if *koo*-wh expressions are indeed indeterminate pronouns, there can be no exhaustive operator

intervening between them and the covert universal quantifier. The resulting structural comfiguration of sentences containing *koo*-wh expressions is given in (66).

(66) $[\forall_p \ldots \quad [koo\text{-}wh \ \text{VP}]]$

The crucial difference between (66) and the semantic representations of Spanish and English FCIs in (61b) lies in the absence of the exhaustive operator. Notice, again, that the analysis in (66) treats *koo*-wh expressions as *selective* indeterminate pronouns, and not as unselective indeterminate pronouns, a possibility that was already rejected in sections 3.3.2 and 3.4.3.[20]

The revised analysis of *koo*-wh expressions in (66) still captures the fact that they come with a basic universal interpretation as argued in section 3.3: *Koo*-wh expressions, being selective, require a universal propositional quantifier that c-commands them at LF and syntactically quantifies over the alternatives introduced by them. On this analysis, *koo* does not have a semantic meaning of its own. Its presence merely signals the existence of alternatives introduced by the indeterminate pronoun (see section 3.3.2 and references there).

The analysis in (66) also accounts for the varying interpretations of *koo*-wh expressions in modal/intensional contexts and under negation (see section 3.2). The propositional quantifier $\forall_p$ is subject to three structural conditions: (i.) it must combine with a constituent that denotes alternative propositions, i.e. vP, IP, TP, or CP; (ii.) it must c-command the *koo*-wh expression; (iii.) there must be no propositional quantifier intervening between $\forall_p$ and the *koo*-wh expression. Since truth-functional modal operators select for propositional complements without being propositional quantifiers, there are two positions available for $\forall_p$ relative to the modal operator. The respective structures are shown in (67):

(67) a. $[_{IP1} \text{Op}_{mod} \ [\ \forall_p \ [_{IP2} \ \ldots \ koo\text{-wh} \ \ldots]]]$

b. [$\forall_p$ [$_{IP1}$ Op_{mod} [$_{IP2}$ … *koo*-wh …]]]

In (67a), $\forall_p$ applies to the proposition selected by the modal operator and takes narrow scope below the modal operator. In (67b), $\forall_p$ modifies the proposition containing the modal operator and takes wide scope over the modal operator. The resulting reading is equivalent to a free choice reading with *any* in English (see section 3.3.3). The negative existential interpretation of *koo*-wh expressions under vP-negation follows directly if vP-negation marks the edge of vP and if $\forall_p$ cannot be inserted inside the vP because there is no propositional adjunction site available (see the discussion in section 3.3.3). (68) shows the resulting structural configuration and its interpretation:

(68) [$\forall_p$ [$_{IP1}$ … [Neg [$_{vP}$ … *koo*-wh …]]] $\quad\quad\quad\quad \forall\neg \Leftrightarrow \neg\exists$

A precondition for the analysis in (68) is that vP-negation is plain truth-conditional negation and does not denote Kratzer & Shimoyama's (2003) negative propositional quantifier. As pointed out by a reviewer, the association of $\forall_p$ and *koo*-wh expression would otherwise be blocked because of an intervention effect (see also Beck 2006).

The derivation of the obligatory $\neg\forall$-interpretation of *koo*-wh expressions under focus negation, cf. (45ab) in section 3.3.2, is not as straightforward. Consider (45a), repeated as (69). The question is how to exclude the $\forall\neg$-reading, which was the only available reading for the vP-negated structure in (68).

(69) ***[bàa koo-waa$_1$ ba]*** *nèe* *[Audu [$_{vP}$* *ya* *kiraa t_1]]*

NEG DISJ-who NEG PRT Audu 3sg.PERF.REL call

'It is not *EVERYONE* that Audu called.' : ¬∀

NOT: 'Audu called (absolutely) NOBODY'/ 'It is NOBODY that Audu called.': ∀¬

A simple way of accounting for the absence of the ∀¬-reading would be to add a stipulation to the effect that $\forall_p$ must not be inserted above the sentential negation marker that brackets the extended CP, cf. (70a). This would leave the configuration in (70b) as the only available option.[21]

(70) a. *[$\forall_p$ [$_{CP}$ Neg [$_{CP}$ [$_{FocP}$ … *koo*-wh …]]]]

b. [$_{CP}$ Neg [$_{CP}$ $\forall_p$ [$_{FocP}$ … *koo*-wh …]]]

Finally, the oscillation between the regular universal and the FC interpretation of *koo*-wh expressions in affirmative episodic contexts can be explained if we assume that the domain widening effects observed with the FC-interpretation are brought about by pragmatic implicatures. Free choice domain widening in Hausa is thus not semantically specified, but follows from pragmatic enrichment in appropriate contexts. According to Aloni (2007: 27-28), such pragmatic enrichment is responsible for free choice effects in languages without a specialized free choice morphology in general.

4.4 Evaluation

On the face of it, the analysis of *koo*-wh expressions as selective indeterminate pronouns under a covert propositional ∀-quantifier is a viable competitor to the more traditional GQ-analysis put forward in section 3. Both analyses are almost equivalent in terms of descriptive

adequacy, as they both account for the bulk of the data in a (more or less) principled way (and without too many additional assumptions, see below).[22]

From a cross-linguistic perspective, the indeterminate analysis has a certain advantage as it would allow for a more unified semantic treatment of Hausa *koo*-wh expressions and their indeterminate *wh*-DISJ counterparts in Japanese and Malayalam: *wh*-DISJ expressions would universally denote selective indeterminate pronouns, and their language-specific interpretation as existentially quantified (Japanese, Malayalam, Kannada), or universally quantified (Hausa/ Chadic, Korean), or as FCIs (Hungarian) would follow from lexical variation in the selectional requirements of the indeterminate pronouns, as shown in (71):

(71) *Cross-linguistic variation in the selectional requirements of wh-DISJ expressions:*

i. Type I: Hausa, Korean → ∀

ii. Type II: Japanese, Malayalam → ∃

iii. Type III: Hungarian → ∀… Exh ⇒ FC

There are also reasons to be sceptical about this unified account in terms of selective indeterminate pronouns, though. For once, unlike indeterminates in Japanese and Malayalam, which can combine with various particles and thus receive different quantificational interpretations in different contexts, Hausa *wh*-expressions only combine with the particle *koo*. This restriction rather suggests an approach in terms of lexicalization, e.g. as generalized quantifiers. The indeterminate account also necessitates some additional assumptions concerning the semantic nature of vP-negation (truth-conditional) and focus negation (propositional quantifier), which are not based on independent evidence at present. Moreover, it would leave existential *wani*-expressions as the only nominal quantifying expressions. This is an unexpected result given that existential quantification is reduced to syntactic

quantification on many theoretical accounts anyway (Kamp 1981, Heim 1982, and many others).[23] The biggest obstacle for the indeterminate account, however, relates to the question of how the obligatory occurrence of a covert c-commanding ∀-quantifier in the structure can be motivated. As pointed out in section 2.2.1, the indeterminate account to quantification incurs a principled mismatch between the syntactic positioning of seemingly quantified nominal expression and their semantic interpretation: The quantificational force does not originate in the nominal expression, but higher up in the structure. To be sure, this is not a conclusive argument against the indeterminate account in principle. Nonetheless, any account along these lines would have to adduce independent evidence, in particular for the existence of propositional quantifiers, in order to be fully convincing.

As it is, this independent evidence is lacking, and moreover, there is a convincing alternative that can account for all relevant observations without any additional stipulations: The GQ-analysis of *koo*-wh expressions in Hausa is more transparent and accessible since all interpretive effects are linked to overt functional elements. In other words, we only interpret what we see. The universal reading is derived in compositional fashion from the meaning of its parts, which can be plausibly taken to denote a focused set variable (*wh*) and the *join*-operator (*koo*), respectively. Moreover, the FC-interpretation in modal/intensional contexts, and the negative existential reading in negative contexts follow from the semantic interaction of the *koo*-wh expression with the relevant operators, assuming the possibility of QR, which is a standard option for generalized quantifiers. To be sure, the assumption of QR adds a certain degree of abstractness to the structural configuration as well. Crucially, though, this only affects the scope of quantification, and not its origin. Given that the existence of scopal ambiguities between GQs and modal/intensional or negative operators is undisputed, one may therefore opt for one's favourite mechanism for resolving such scopal ambiguities when they show up with *koo*-wh expressions. Finally, recall that section 3.3.3 adduced independent

evidence to the effect that universally quantified expressions can or even must scope above negation in natural language.

In light of this, we reject the indeterminate analysis in favor of the GQ-analysis for Hausa *koo*-wh expressions, at the cost of giving up on a unified semantic analysis of *wh*-DISJ expressions in natural language. This notwithstanding, the analysis of *koo*-wh expressions as selective indeterminate pronouns qualifies as an interesting alternative to the traditional GQ-analysis, which is well worth being explored in more detail, in particular as it might pave the way towards a cross-linguistically unified analysis of the phenomenon of *wh*-DISJ expressions in natural language.

4.5 Conclusion

The section started out from the observation that *koo*-wh expressions in Hausa show certain structural and interpretive parallels to FCIs. In addition, we observed that Hausa does not have a distinct class of FCIs, unlike English. Rather, *koo*-wh expressions fulfil the double semantic role of expressing regular universal quantification and free choice interpretation. This gave rise to the question of how to account for the cross-linguistic variation in the realization of free choice. Based on Menéndez-Benito's (2005) analysis of FCIs in English and Spanish as selective indeterminate pronouns, we considered an analysis of Hausa *koo*-wh expressions as selective indeterminate pronouns that obligatorily associate with a covert propositional ∀-quantifier. Hausa *koo*-wh expressions would differ from regular FCIs, however, in that they do not come with an exhaustive operator in the semantic representation of the clause. This difference accounts for the wider syntactic distribution of *koo*-wh expressions and for why they are typically interpreted as regular universal quantifiers. While the indeterminate analysis is certainly feasible, and while it accounts for the relevant facts without too many additional assumptions, it incurs a mismatch between overt syntax and

semantic representation, as it necessitates the existence of covert propositional quantifiers. For this reason, it was rejected it in favor of the analysis of *koo*-wh expressions as generalized quantifiers from section 3, which does not rely on the existence of abstract elements.

5. Conclusion

The first objective of this study was a comprehensive analysis of the quantificational system of Hausa (Chadic) in terms of the opposition of lexical and syntactic quantification. Particular attention was paid to the expression of regular universal quantification and free choice by means of the lexical class of *koo*-wh expressions, which are morpho-syntactically complex expressions consisting of a disjunction marker and a *wh*-expression (*wh*-DISJ expressions)

The second, more general, objective was an account of the observable cross-linguistic variation in the interpretation of *wh*-DISJ expressions and in the linguistic encoding of free choice. Hausa *koo*-wh expressions have two properties that make them interesting from the perspective of cross-linguistic comparison. First, their interpretation with universal force sets them apart from structurally parallel wh-DISJ expressions in languages such as Japanese and Malayalam (section 3). Second, *koo*-wh expressions exhibit structural and interpretive parallels to FCIs in the absence of a distinct lexical class of FCIs (section 4). The simultaneous striving for an adequate analysis of quantificational structures in one language (Hausa) and for a unified analysis of the observable cross-linguistic variation creates a certain tension, which is reflected in the rhetorical structure of the article.

Section 3 put forward an analysis of *koo*-wh expressions as universal GQs. The GQ-analysis gives a satisfactory compositional account of the Hausa facts, but it meets with certain problems when it is extended to capture the cross-linguistic variation in the interpretation of *wh*-DISJ expressions. For this reason, the conclusion of section 3 was that the

differences in interpretation of *wh*-DISJ expressions across languages are due to the workings of different interpretive mechanisms.

Because of this problem, section 4 proposed an alternative analysis of *koo*-wh expressions as selective indeterminate pronouns in the spirit of Kratzer & Shimoyama (2002) and Menendéz-Benito (2005). The main advantage of the indeterminate analysis over the alternative GQ-account is that it provides the basis for a unified account of the interpretation of wh-DISJ expressions in different languages.

The discussion has uncovered a general problem that shows up in the analysis of cross-linguistic variation. In deciding between two competing analyses A and B it is often not sufficient to consider their descriptive adequacy relative to one language. Instead, one has to gauge the adequacy of the respective analyses relative to different language types with different properties. An analysis A may seem more adequate when applied to one language in isolation, but an alternative analysis B may be more adequate when we adopt the more general perspective of cross-linguistic variation.

In the case at hand, the GQ-analysis is more adequate, as long as we only consider the Hausa facts in isolation. Importantly, the analysis is strictly compositional and – unlike the indeterminate account – it does not postulate the existence of covert semantic operators. The indeterminate account is thus more abstract, and, hence, less attractive as an account of *koo*-wh expressions in Hausa. For this reason, it was rejected at the end of section 4. At the same time, its more abstract semantic representation can provide the basis for a unified cross-linguistic analysis of *wh*-DISJ expressions and their varying interpretation across different syntactic contexts. From the wider perspective of universal validity and general explanatory power, then, the indeterminate analysis has something to it, too. It is hoped that future research on quantification in natural language will tell us more about the respective

advantages and disadvantages of the (lexical) GQ-strategy and the (syntactic) propositional strategy of quantification, as they apply in individual languages and cross-linguistically.

Notes

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[1] The following abbreviations are used in the glosses: sg = singular, pl = plural, f = feminine, m = masculine, COP = copula, DEF = definite, DISJ = disjunction, FUT = future, NEG = negation, PERF = perfective, PROG = progressive, PROG.REL, PERF.REL = relative (the aspectual form used in relative clauses, wh-clauses, and with focus fronting), PRT = particle, REL = relative marker, SUBJ = subjunctive.

[2] Apart from semantic considerations, the label *focus negation* is supported by the fact that the negation markers optionally bracket the fronted focus constituent. A relevant example is found in (37b) in section 3.1.

[3] We neglect the observable semantic differences between the different indefinite expressions, see Farkas (2002) and n.23 for discussion.

[4] We leave it open whether the existential force associated with *yàazaawaa biyu* in (20a) is provided by the verb meaning, as argued in Carlson (1977), or whether it comes from a covert existential operator, which would be located at the edge of vP below negation. What is crucial for our purposes is that the existential force does not reside in the NP itself and must therefore be mediated by the syntax. Interestingly, the Central Chadic language Bura provides overt evidence for the existence of an existential quantifier that is situated below negation at the edge of vP, see Zimmermann (2007).

[5] Parallel facts have recently been observed in languages or language groups as diverse as Cuzco Quechua (Faller & Hastings 2008), Malagasy (Keenan 2008) and Bantu (Zerbian & Krifka 2008).

[6] The neutral label FP is chosen because, as shown in (3g), definite determiners in Hausa must occur in postnominal position. This suggests that the functional projection headed by *wani/wata/wasu* is not a DP.

[7] As a reviewer points out, the status of modification with *almost* as a diagnostic for universal quantification has been disputed by Horn (2000).

[8] There are further differences and similarities between these languages: First, Japanese and Malayalam also exhibit combinations of a *wh*-expression and the conjunction marker, which are interpreted as universal quantifiers. A corresponding *wh*-CONJ expression, be it with existential or with universal force, is not found in Hausa. Second, Korean resembles Japanese and Malayalam, and differs from Hausa in allowing for the formation of *wh*-CONJ expressions with a universal interpretation (Gill et al. 2004). Third, Korean *wh*-DISJ expressions resemble their Hausa counterparts in allowing for additional FC-like and negative existential readings, cf. Gill (2004) and Kim & Kaufmann (2007) for extensive discussion.

[9] Notice, though, that some FCIs in other languages, e.g. Spanish *cualquiera*, do not display quantificational variability effects either. Thanks to an anonymous reviewer for pointing this out.

[10] Of course, this leaves open the possibility of analyzing *koo*-wh expressions as indeterminate pronouns of a special kind, namely as selective indeterminate pronouns that must combine with a covert universal quantifier. We will return to such an analysis, which is more in line with the analyses of FCIs in Menéndez-Benito (2005) and Aloni (2007), in section 4.

[11] Hausa and Greek would thus constitute exceptions to the generalization that universal quantifiers must not covertly raise across negation, as illustrated in (ia), which only allows for the surface ¬∀-reading and thus cannot have the LF in (ib) (cf. Beghelli & Stowell 1997, Zeijlstra 2004):

(i) a. I did not see everybody.

b. LF: *I did everybody$_1$ [not see t$_1$].

Following the discussion in the main text, this difference between Hausa and English can be taken to follow from a difference in the structural status of vP-negation.

[12] The behaviour of *koo+wh* in negative subjunctive directives seems to contradict this generalization. The *wh*-DISJ-quantifier in (i) is interpreted existentially even though it occurs outside the vP:

(i) ***kadà koo-waa*** *yà* *fìta* *ɗaakì-n*

NEG DISJ-who 3sg.m.SUBJ leave room-DEF

'Nobody may leave the room!' (Newman 2000:623)

This problem can be solved by assuming that *kadà* originates in a position below the *koo*-wh expression, where it is also interpreted, see e.g. Newman (2000:365), who considers the sentence-initial position of the adverb *kadà* as unusual. On this line of thought, movement of *kadà* takes place to mark the directive force of the utterance, but has no further semantic effect. The situation is comparable to that found with verb movement in German. The main function of verb movement in German to first or second position is to type a clause as imperative/*y-n*-interrogative or declarative/*wh*-interrogative, respectively. Nonetheless, the verb is interpreted in its base-position, as witnessed by the identical scope relations between negation and the modal verb *wollen* in (iab):

(i) a. *Ich habe* ***nicht gewollt****, dass er kommt.* (Vfinal: ¬∀)
I have not wanted that he comes

b. *Ich* ***will*** ***nicht****, dass er kommt.* (V2: ¬ ∀)
I want not that he comes
'I did/ do not want that he comes.'

[13] Even though Hausa makes a grammatical distinction between singular and plural, it is not clear whether there is a corresponding semantic distinction. For instance, number words can combine with both singular and plural NPs (unlike in English, where they can only combine with plural NPs) (cf. Newman 2000, Jaggar 2001:359):

(i) a. *mootàa biyu*
car-SG two

b. *yâraa biyu*
child-PL two

One way to capture these facts is by assuming that singular NPs in Hausa denote the power set of the NP-domain, including the singleton sets. Correspondingly, a singular *wh*-expression would denote a set variable, as is assumed in the main text. In contrast, plural NPs in Hausa would denote the power set minus all singleton sets. See Zimmermann (2008: 431) for more discussion of this point.

[14] While consultants confirm the inherent distributivity of *koo*-wh expressions in elicitations, one occasionally finds instances of a *koo*-wh expression occurring with collective predicates in written corpora, cf. (i):

(i) ***koo-waa*** *yaa watsèe.*
DISJ-who 3sg.PERF disperse
'Everybody dispersed.' vs. *Each-one dispersed'

At this point, it remains unclear whether data such as (i) warrant the claim that a collective construal for *koo*-wh expressions is generally available. If so, this would cast some doubt on the GQ-analysis presented here.

[15] This interpretation of (53) is explicitly rejected for Malayalam in Jayaseelan (2001, 2004), who argues that the disjunction marker *–oo* is never found in the clausal periphery. This claim is motivated by the fact that *–oo* can

be embedded under the conjunction marker. In Japanese, the disjunction marker *ka* does in fact occur in the clausal periphery and thus operates on propositions, but only when it functions as a question-operator, see Nishigauchi (1990) for relevant discussion and data. We leave it open whether Japanese *ka* is ambiguous, or whether the existential and interrogative interpretation follow from the observed difference in the syntactic position of *ka*. The relevant fact for the present discussion is that *ka* does not seem to occur in the clausal periphery when the *wh*-expression is interpreted with existential force.

[16] See Haspelmath (1997) for a list of languages that behave like Hausa in exhibiting no specialized words or morphemes for free choice meanings.

[17] The exact structure of the constructions in (59ab) is somewhat mysterious as they do not exhibit the relative marker *dà* 'that', which is typically present in relative clauses (Newman 2000:624). Newman (2000:625) points out another interesting fact about generic relatives with *koo-wh* expressions, which relates to a discussion in Giannakidou & Cheng (2006:157). Consider the minimal pair in (iab), where (ia) contains the lexicalized unit *koo-waa* with H-tone on *waa*, and (ib) a combination of *koo* with the basic interrogative (L-toned) pronoun *wàa*.

(i) a. ***koo-waa*** *ya* *zoo* *kà* *cê naa* *fìta* [Newman 2000:625]

DISJ-who 3sg.m.PERF.REL come 2sg.m say 1sg leave

'Whoever comes (i.e., if anyone comes), tell him I went out.

b. ***koo*** ***wàa*** *ya* *zoo* *kà* *cê naa* *fìta*

DISJ who 3sg.m.PERF.REL come 2sg.m say 1sg leave

'No matter who comes (but I am assuming that someone will come), tell him I went out.'

The two variants come with a slight difference in meaning, as indicated by the two different paraphrases from Newman. The presence of *koo-waa* in (ia) is fully compatible with a state of affairs in which nobody comes, whereas the variant *koo wàa* in (ib) expresses the speaker's assumption that somebody will come. In Giannakidou & Cheng's (2006) terms, *koo-waa* in (ia) is syntactically and semantically an indefinite FC (with a universal interpretation), corresponding to English *any*, whereas *koo wàa* would correspond to a free relative (*whoever*), which are semantically definite according to Jacobson (1995). For reasons of space, we will leave the issue of the two readings and how to derive them for future research.

[18] The Hungarian pattern appears to be a special instance of the more general pattern of FCI-formation from a scalar particle and an indefinite expression. The general pattern is found, e.g., with Hindi *ek bhii* 'any' (lit. 'one even') (Lahiri 1998).

[19] The fact that Menendéz-Benito (2005) derives the ungrammaticality of sentences like (61a) with FCI *any* not from structural factors (such as licensing, etc.), but from their semantic status as expressing a logical contradiction is highly problematic, and gives sufficient reason to be sceptical about the entire approach. Consider the complex sentence in (i), which is grammatical although it expresses a logical contradiction and can never be true (as indicated by the #-sign):

(i) #Maiduguri is a city in Northern Nigeria, and Maiduguri is not a city in Northern Nigeria.

Nonetheless, we will stick with Menendéz-Benito's (2005) assumptions for the sake of the argument.

[20] The exhaustivity operator postulated for English *any* also plays a crucial role for its interpretation in the scope of the modal verb *can*. The Canasta-example from Menendéz-Benito (2005) constitutes a case in point. In Canasta, if a player has two cards matching the top card of the discard pile, she has exactly two options: (a.) take all the cards in the discard pile and (b.) take no card from the discard pile (but the top card of the regular pile). In this scenario, sentence (i) with *any* is judged as false, due to the workings of the exhaustivity opertor:

(i) In Canasta, you can take any of the cards from the discard pile when you have two cards that match its top card.

Now, as pointed out by a reviewer, if Hausa *koo*-wh expressions come without a c-commanding Exh-operator, as postulated in (66), the Hausa counterpart to (i) with a *koo*-wh expression should be true in the given scenario. Unfortunately, I have not yet been able to check the data with native speaker consultants. However, the fact that the *koo*-wh expression *koo-wànè harshèe* 'every/any language' in (47) can get a plain universal interpretation in the presence of modal *can*, leads me to suspect that the Hausa-counterpart to (i) will also be true (because the addressee is allowed to take all the cards from the discard pile), as predicted by the analysis in (66).

[21] The ungrammaticality of (70a) can be derived as an intervention effect if focus negation is taken to involve a negative propositional quantifier in the sense of Kratzer & Shimoyama (2002), which would block the association of the *koo*-wh expression with $\forall_p$ in (70a). In view of the alternative-inducing nature of focus (Rooth 1985), the assumption that focus negation operates over alternative propositions is not far-fetched, but, at present, we lack independent evidence to corroborate this claim. There may be other ways of accounting for the $\neg\forall$-interpretation of (69). A promising line of investigation is the discussion of focused or emphatic NPIs and FCIs in Krifka (1995) and Chierchia (2005). Ideally, the unattested $\forall\neg$-reading would be ruled out by the joint workings of focus/emphasis and negation. We will not explore these alternative accounts for reasons of space.

[22] An unsolved problem for both accounts is the ungrammaticality of *koo*-wh expressions in subject position above vP-negation, as illustrated in (i):

(i) ***koo-waa / koo-wànè ɗaalìbii*** ***bà****-i* *ci* *jarr̃̃àbâawaa* ***ba****.*

DISJ-who DISJ-which student NEG-3sg.SUBJ eat exam NEG

intended: 'Everybody/ every student did not pass the test.'

This restriction also shows up with *every* and *any* in English (Beghelli & Stowell 1997, Zeijlstra 2004):

(ii) a. *Every/each student didn't cheat on the exam.

b. *Any student doesn't cheat on the exam.

The ungrammaticality of (iia) does not directly fall out on a GQ-analysis of *each/every*. Nor does the ungrammaticality of (iib) would seem to fall out from an indeterminate analysis of *any* without additional assumptions.

[23] In response to this problem, one might want to analyze *wani*-expressions as indefinite expressions that are lexically marked for specificity/topichood, along the lines proposed in Farkas (2000). On this account, there would be genuine GQs in Hausa whatsoever, but only the series of indefinite expressions in (i):

(i) *wani*-expressions <> bare indefinites <> *koo*-wh expressions

topic, specific unmarked unspecific, universal, FC

The analysis of *wani*-expressions as indefinite topics is motivated by the following observations (see also section 2.2.3): First, *wani*-DPs typically take widest scope (Zimmermann 2008), as do aboutness topics (Endriss 2007). Second, the *wani*-determiner typically occurs on nominal expressions that make good aboutness topics, in particular on [+human] subject DPs (Jaggar 1988, Zimmermann 2008). Third, they introduce discourse referents that can be anaphorically picked up in subsequent discourse (Jaggar 1988, Zimmermann 2008). Recall that the main characteristic of aboutness topics is that they (re)introduce a discourse referent as an address under which information can be stored in subsequent discourse (Reinhart 1982). If *wani*-expressions are indeed (preferably) interpreted as topics, their existential force can be made to follow from the general interpretation scheme for aboutness topics. Following Endriss (2007), sentences with aboutness topics are interpreted as a conjunction of two speech acts, namely (i.) a topic-introducing speech act, which involves existential quantification over a restricted indefinite, and (ii.) an assertion that predication over the topic. Both speech acts are conjoined by means of speech act conjunction (cf. Krifka 2001), as shown in (ii):

(ii) TOP: **(∃x** [car'(x)]) $\wedge_{\text{speech-act}}$ ASS (broke_down'(x))

According to (ii), the existential force observed with *wani*-expressions would not follow from their lexical meaning, but would be the result of syntactic quantification. More generally, the indefinite account of *wani*-

expressions, together with the analysis of *koo*-wh expressions as selective indeterminate pronouns in the main text, would seem to imply that all quantification in Hausa is syntactic. This claim has been made for a number of natural languages in Bach et al. (1995), but it remains to be seen to what extent this is the correct way of thinking about Hausa. For reasons of space, we must leave the investigation of this interesting claim for another occasion.

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