Journal of Pragmatics 127 (2018) 84–106

Contents lists available at ScienceDirect

Journal of Pragmatics

journal homepage: www.elsevier.com/locate/pragma

From conditionality to modality in Luganda (Bantu, JE15): A synchronic and diachronic corpus analysis of the verbal prefix *-andi-*

Deo Kawalya [a], Gilles-Maurice de Schryver [b, c, *], Koen Bostoen [b]

[a] School of Languages, Literature and Communication, Makerere University, PO Box 7062, Kampala, Uganda
[b] BantUGent – UGent Centre for Bantu Studies, Department of Languages and Cultures, Ghent University, Rozier 44, 9000 Ghent, Belgium
[c] Department of African Languages, University of Pretoria, 0002 Pretoria, South Africa

ARTICLE INFO

Article history:
Received 29 November 2016
Received in revised form 18 January 2018
Accepted 29 January 2018

Keywords:
Modality
Conditionality
Protasis
Apodosis
Diachronic corpus study
Luganda

ABSTRACT

This article offers a synchronic and diachronic analysis of the use and meaning of the verbal prefix *-andi-* in the Great Lakes Bantu language Luganda (JE15). On the basis of a text corpus of 4 million tokens, we show that the prefix, commonly described as a conditional marker, is primarily involved in the expression of modal meanings, specifically deontic necessity and epistemic possibility. Our thirteen-decade diachronic corpus analysis shows that there is a relationship between the increased use of *-andi-* outside syntactically complex conditional constructions, i.e. those having both a protasis and an apodosis, and an increase in its expression of modal meanings. Moreover, a reduction in the use of *-andi-* in complex conditional constructions goes hand in hand with a reduction in its expression of conditional meanings. It is further revealed that contrary to the common cross-linguistic tendency to rely on modality as a source for conditionality, the conditional meaning of *-andi-* is not post-modal. Instead it was primarily a conditional marker, which subsequently developed different modal meanings.

© 2018 Elsevier B.V. All rights reserved.

1. Introduction

1.1. On the interplay between conditionality and modality

Several typological studies have dealt with conditionality as a meaning typically originating in modality (Bybee et al., 1994; Traugott, 1985), more specifically as a post-modal destination for either epistemic possibility or epistemic necessity (van der Auwera and Plungian, 1998: 98). In Bantu linguistics, the historical relationships between modal and conditional markers have not raised much interest so far. Modality and conditionality have at best each been dealt with in isolation. In this article, we show that the Ugandan Bantu language Luganda has a verbal prefix *-andi-* that is neither a dedicated conditional marker nor a dedicated modal marker, contrary to what has been described in the literature. As we show on the basis of a Luganda text corpus, it currently straddles the semantic domains of modality and conditionality. What is more, we argue, by means of a

* Corresponding author. BantUGent – UGent Centre for Bantu Studies, Department of Languages and Cultures, Ghent University, Rozier 44, 9000 Ghent, Belgium.
E-mail addresses: kawalyad@chuss.mak.ac.ug, kawalyad@gmail.com (D. Kawalya), gillesmaurice.deschryver@UGent.be (G.-M. de Schryver), koen.bostoen@UGent.be (K. Bostoen).

https://doi.org/10.1016/j.pragma.2018.01.011
0378-2166/© 2018 Elsevier B.V. All rights reserved.

Abbreviations and symbols

APPL	applicative
AUGx	augment of class x
CF	counterfactual(ity)
CONN	connective
DEMa	proximal demonstrative
DEMb	medial demonstrative
DeNe	deontic necessity
EPo	epistemic possibility
FV	final vowel
H	high tone
HYP	hypothetical(ity)
INF|	infinitive
IPFV	imperfective
LOCx	locative of class x
N	homorganic nasal
NEAR_FUT	near future
NEAR_PST	near past
NEG	negative
NEUT	neuter
NPx	nominal prefix of class x
Ø	zero/empty morph
OPx	object prefix of class x
PASS	passive
PFV|	perfective
PL	plural
POSSx	possessive of class x
PPx	pronominal prefix of class x
PRS	present
RECP	reciprocal
REFL	reflexive
RELx	relative of class x
REM_FUT	remote future
REM_PST	remote past
SG	singular
SPx	subject prefix of class x
TA(M)	Tense, Aspect (, Modality)
UNR	the unreality marker *-andi-*

diachronic corpus analysis, that the conditional meaning of *-andi-* is not post-modal. Quite the contrary, it used to be primarily a conditional marker, which subsequently developed different modal meanings, such as deontic necessity and epistemic possibility. In other words, we present here language-specific counterevidence for the common cross-linguistic tendency to rely on modality as a source for conditionality.

1.2. On conditionality

Various definitions and typologies of conditionals exist (see Comrie, 1986; Dancygier, 1993, 1998; Declerck and Reed, 2001; Saloné, 1979; Sweetser, 1990, among others). This is partly due to the large number of criteria that can be used to categorize and interpret conditionals. Formulating a precise and universally applicable definition of conditionals has proven to be extremely difficult, not to say impossible (Declerck and Reed, 2001: 8). Proposing such a definition is neither an aim nor a necessary condition for the current study. We have deemed it more meaningful to first present those typologies of conditionality that have informed our research on Luganda conditionals as it proceeded.

A classic and widely used distinction is the one between simple, hypothetical and counterfactual conditionals. It also underlies the work of Saloné (1979) on Haya (JE22), a Tanzanian Bantu language closely related to Luganda, which is one of the rare dedicated studies on conditionals in Bantu, along with his subsequent dissertation on conditionals in Swahili (G42d) (Saloné, 1983a). For simple conditionals, he states that "a proposition results if another proposition holds", as shown in (1) and (2). Hypothetical conditionals, as in (3), on the other hand, are those "in which the antecedent introduces a hypothetical or

imaginary proposition (where that proposition is not assumed to be false)". Counterfactual conditionals refer to "sentences in which the antecedent asserts a proposition which is assumed to be false", as in (4). Saloné (1979) further adopts another common distinction, i.e. between 'real' and 'unreal' conditionals. Semantically, so-called 'Unreality Conditionals' include future simple conditionals (2), hypotheticals (3) and counterfactuals (4). Structurally, however, future simple conditionals (2) do not make use of a syntactic marker of unreality, unlike other semantic types of unreal conditionals. Hence, syntactically, they resemble semantically real conditionals, such as the simple present conditional in (1).

(1) If the sun shines, the birds sing.
(2) If you go to the store, I will cook.
(3) If I saw Sidney Poitier in person, I'd faint.
(4) If he had cooked, I would have eaten.
(Saloné, 1979: 65;66)

Another often cited definition is the one by Comrie (1986: 78) who conceives conditionals from a logical perspective as "a relation between two propositions, the protasis (p) and the apodosis (q), such that either p and q are both true, or p is false and q is true, or p is false and q is false; excluded is the possibility of p being true and q is false." In his attempt at a cross-linguistic characterization of conditionals, he adds, as a further restriction to his definition in natural language, that "the content of the protasis must be interpretable as a cause of the content of the apodosis" (Comrie, 1986: 80). He identifies four major parameters necessary for the description and categorization of conditionals; namely clause order, marking of conditionality, degrees of hypotheticality and time reference.

In contrast to Comrie's basically semantic definition, Dancygier (1993: 403), whose work we have only discovered in the course of writing the current article, primarily defines a conditional in formal-structural terms as "a complex sentence composed of the main clause (q, or the apodosis) and a subordinate clause (p, or the protasis) introduced by a conditional conjunction, which in the majority of conditional sentences in English is *if*" (see also Dancygier, 1998: 1). Two parameters inform this English-based definition, viz. the presence of *if*, which signals the speaker's non-assertiveness of the assumption in the protasis and the syntactic frame *if p, then q*, which signals a semantic or pragmatic relation between *p* and *q*, whereby *q* can only be asserted after assuming *p*. Dancygier further subdivides conditionals on functional grounds into predictive and non-predictive conditionals. Formally, predictive conditionals are characterized in terms of backshift, that is, "the time reference intended by the speaker is systematically *later* than the time referred to by the verb form in its prototypical (non-conditional) uses" (Dancygier, 1993: 406). Semantically, clauses in predictive conditional constructions are said to exhibit sequential and causal relations, such that the proposition in the protasis precedes the proposition in the apodosis (Dancygier, 1993: 412). All sentences in (1) to (4) above are classified as predictive in Dancygier's typology; in addition to all of them exhibiting sequential and causal relations, (2) to (4) also exhibit backshift.

Sentence (5) is an example of a non-predictive conditional. In such conditionals, the kind of backshift exhibited in predictive conditionals does not occur. In this sentence, the verb forms refer to the time that they indicate; the verb in the protasis is in the present and it also refers to the present, while the verb in the apodosis indicates past and also refers to the past.

(5) If she is in the lobby, the plane arrived early.
(Dancygier, 1993: 415)

In non-predictive conditionals, there is also a lack of content relation between the assumptions expressed in the clauses. In conditional constructions like (5), where events are presented in reversed chronological order, causality cannot arise according to Dancygier (1993: 423), because no sequentiality of events is indicated by the sequence of clauses. Moreover, verb forms in the protasis of non-predictive conditionals are selected and interpreted in basically the same way as in independent sentences (Dancygier 1993: 421). This is unlike in predictive conditional constructions, where the choice of verb forms used systematically indicates the degree of unassertability introduced by the protasis: "the further the verb forms used go back in time, the lower the predictions are on the scale of assertability". The provisionally assumed future truth of the assumption in the scope of *if,* is necessary for the prediction in the apodosis to be valid. Additionally, predictive statements can be presented hypothetically: the prediction in the apodosis is made despite the fact that the condition in the protasis is "not only predictable at the moment of speech, but also possibly unassertable or necessarily unassertable" (Dancygier, 1993). In the protasis of a non-predictive conditional, the type of unassertability expressed has rather to do "with the distance the speaker marks between his set of beliefs and an assumption which is contextually bound or represents the hearer's perspective, rather than with any claim that the material in the protasis is in itself unassertable" (Dancygier, 1993).

Both Comrie's semantic definition and the real vs. unreal conditionals can therefore be subsumed under Dancygier's predictive type. Non-predictive conditionals are not considered conditionals under Comrie's definition, for lack of causality, while Saloné considers them as part of real (simple) conditionals, although he provides no further explanation. Thus, Dancygier's predictive type of conditionals cuts across the widely accepted distinction between real and unreal conditionals (see Comrie, 1986; Dancygier, 1993: 414; Parker, 1991; Saloné, 1979, 1983a, b).

Generally, studies of conditional sentences have paid more attention to the protasis and its markers than to the apodosis (Kumakiri, 2013: 155). Studies such as Haiman (1978) and Traugott (1985) are cases in point. Kumakiri (2013) attributes this

state of affairs to two reasons: (i) because well-studied languages, such as English, have a marker for the protasis, but not for the apodosis, and (ii) because the sentence structure of the apodosis is usually the same as that of ordinary sentences, while that of the protasis is not.

Apart from the previously cited work of Saloné on Haya and Swahili, dedicated studies of conditionals in Bantu only existed until recently for Northern Sotho (S32), spoken in South Africa (Lepota, 2002; Taljard and Louwrens, 2003). A 2017 special issue on conditional constructions in African languages (Nicolle, 2017) also includes articles on the Bantu languages Ndendeule (N101) from Tanzania (Ngonyani, 2017), Cuwabo (P34) from Mozambique (Guérois, 2017) and Swahili from Eastern Africa (Mwamzandi, 2017), the latter study being based on the annotated Helsinki Corpus of Swahili.

1.3. On modality

Modality has been defined in different ways in the literature. In its broad sense, it refers to "any kind of speaker modification of a state of affairs" (Nuyts, 2006: 1; 2016: 32). So used, the term includes related notions, such as tense and aspect. In this article, however, we use modality in its narrower sense to refer to a semantic subfield within the wider tense-aspect-modality (TAM) domain. Although there is seemingly no consensus on the precise definition of modality, especially in this narrower sense, possibility and necessity are generally regarded as core modal concepts (van der Auwera and Plungian, 1998: 86). Within the framework of Nuyts (2006, see also Nuyts, 2016 for a more detailed account and exemplification), three categories of modality are distinguished: dynamic, deontic and epistemic modality. Dynamic modality, further sub-categorized into participant-inherent, participant-imposed, and situational dynamic modality, is characterized as an ascription of the capacity or ability, or necessity, to the first-argument participant in the state of affairs. Traditionally defined in terms of 'permission' and 'obligation', deontic modality is treated in more general terms by Nuyts (2006: 4) as "an indication of the degree of moral desirability of the state of affairs expressed in the utterance." The last type, epistemic modality, involves an estimation of the chances or the likelihood that the state of affairs expressed in the clause applies in the world.

1.4. On the use of a corpus

Corpus studies in Bantu linguistics have steadily taken shape since their beginnings at the turn of the millennium (de Schryver, 1999; de Schryver and Gauton, 2002). A recent statement of the various issues involved in corpus building for the Bantu languages, especially with regard to the difficulties in building an oral component and topic/genre bias, may be found in Nabirye (2016: 29–44). In the area of modality, studies such as Devos (2008), Bostoen et al. (2012), Mberamihigo (2014), Kawalya et al. (2014) and Mberamihigo et al. (2016) have, either in part or entirely, relied on corpus data to derive their hypotheses. van der Auwera and Diewald (2012) have underscored the usefulness of a corpus methodology in studies of modality, especially if one's investigation is to involve frequencies and diachrony, which are central objects in the present study.

Our corpus contains 4 million running words and comprises material from 18 different topics and genres: agricultural documents, cultural texts, environmental documents, financial texts, folktales, health documents, historical texts, inspirational materials, instructional materials, legal texts, magazines, newspapers, novels, plays, political documents, radio news, religious texts, and songs. In terms of period distribution, the material goes back to the earliest texts in Luganda, which date from the end of the 19th century, and goes all the way to the present. An earlier version of this corpus (containing 1.5 million running words) was used in a study of the modal verb *-sóból-* in Luganda (Kawalya et al., 2014).

1.5. On the structure of this article

The article is organized as follows. In Section 2 we review previous literature on Luganda in light of how they have treated *-andi-*, including a brief description of reality and unreality conditionals. In Section 3 we present a new corpus-based study of the synchronic uses (i.e., in the 2000s and 2010s) of *-andi-*, first in conditional constructions and then outside conditional constructions. In Section 4, we subsequently subject *-andi-* to a diachronic corpus analysis on the basis of thirteen time periods, i.e. 1890s–2010s. A discussion and conclusions follow in Section 5.

2. Previous descriptions of *-andi-*

A literature review of Luganda grammars, dictionaries and handbooks reveals that *-andi-* has been predominantly treated as a conditional marker. Those earlier descriptions of conditional constructions are unfortunately very unbalanced and manifest many gaps. The analysis of *-andi-* as a modal marker is even more problematic, not to say inexistent. It is precisely these lacunae in the treatment of *-andi-* that call for a careful reconsideration of its semantic categorization and delimitation, as we do in this article through a corpus-based approach from Section 3 onwards. Before we start our review of earlier

accounts of *-andi-*, it should be mentioned that several sources also give the forms *-ali-* and/or *-aku-* as (older) alternatives to *-andi-* (see Crabtree, 1902; Gorju, 1906; Kirwan and Gore, 1951; Le Veux, 1914; Livinhac, 1885; Livinhac and Denoit, 1894; Livinhac et al., 1921; Nosova and Yakovleva, 1969). These allomorphs will not be considered in this article.

2.1. The use of *-andi-* as a conditional marker, and other conditionals

Often translated as 'would', the verbal prefix *-andi-* has previously been described as a conditional marker by various Luganda grammarians (see Ashton et al., 1954: 324; Chesswas, 1963: 85; Crabtree, 1902: 159; Kirwan and Gore, 1951: 69; Livinhac, 1885: 42ff; Livinhac et al., 1921: 72). It is reported as commonly occurring in the apodosis of conditional sentences, as in (6), but it may also be concurrently used in both the apodosis and the protasis, as in (7).[1–3]

(6) Ssingá namúlaba nándímúgámbye.[1]
singa N-a-mu-lab-a **N-andi-mu-gamb-ye**
if SP_{1SG}-REM_PST-OP_1-see-PFV **SP_{1SG}-UNR-OP_1-tell-PFV**
'If I had seen him, I would have told him.'[2]
(Chesswas, 1963: 181)

(7) Sándigenze Ntébe omwámi né bwé yándíngámbye.
si-andi-gend-ye Ntebe o-mu-ami ne_bwe
NEG.SP_{1SG}-UNR-go-PFV Entebbe AUG_1-NP_1-master even_though
a-andi-N-gamb-ye
SP_1-UNR-OP_{1SG}-tell-PFV
'I would not have gone to Entebbe even though the master had sent me.'[3]
(Ashton et al., 1954: 325)

The same grammarians, however, describe other kinds of conditional structures that do not necessarily involve the use of *-andi-*. Table 1 summarizes conditionals as described in the literature on Luganda and categorizes them using typology of Dancygier (1993, 1998).

Following Dancygier (1993, 1998), previously described conditionals in Luganda generally fall under the predictive type, notwithstanding some cases of non-predictive as well as so-called 'concessive' conditionals (Dancygier, 1998: 160 ff; Dancygier and Sweetser, 2005: 142 ff; Declerck and Reed, 2001: 334 ff, 469 ff). Unlike English predictive conditionals, which are characterized by backshift, Luganda predictive conditionals seem to mostly not involve this phenomenon. For example, protases which indicate the past, as in (6), also refer to the past. There are, however, cases as (8) in which backshift is exhibited: although the verb in the protasis indicates the present, it refers to the future, since its hypothetical nature allows for the possibility of the hearer to speak Luganda every day at a point in the future.

(8) Singá Olugánda obáddé olwógérá buli lunáku, wándífúúse mangú ómúkúgú.
singa o-lu-ganda **o-Ø-ba-ye** o-Ø-lu-oger-a
if AUG_{11}-NP_{11}-Ganda **SP_{2SG}-PRS-be-PFV** SP_{2SG}-PRS-OP_{11}-speak-IPFV
buli lu-naku **o-andi-fuuk-ye** mangu o-mu-kugu
every NP_{11}-day **SP_{2SG}-UNR-become-PFV** quickly AUG_1-NP_1-expert
'If you spoke Luganda every day, you would quickly become an expert.'
(Ashton et al., 1954: 324)

Conditionals in Luganda can be introduced by different markers in the protasis. Their apodoses can also take different shapes. According to Ashton et al. (1954: 325), conditionals expressing "what could or would happen in the future, if a future condition were fulfilled" are introduced by the conjunction *bwe* 'if', as shown in (9). In this particular sentence, the verbs in the protasis and the apodosis are both marked for future tense, more specifically near and remote future respectively. If the protasis verb is in the near future, the verb in the apodosis can either be in the near future or far future. However, if the protasis verb is in the far future, the verb in the apodosis can only be in the far future. As can be seen from the translation, this sentence can also receive a temporal interpretation.

[1] The original orthography is maintained for quoted material, as well as the original translation, except when otherwise noted. The morphological parsing and glossing, for which a uniform orthography has been adopted, is ours throughout.

[2] Our translation, as no translation was given.

[3] In this example, the canonical order within a conditional sentence is reversed, with the apodosis coming before the protasis. This does not change the sequence *if p, then q* of the propositional content of the clauses.

Table 1
Conditionals in Luganda, according to the existing literature.

Protasis (marker and verb tense)	Apodosis (marker and/or verb tense)	Type of conditional	Example
bwe … future	future	Predictive	(9)
singa … present	present	Predictive	(10)
singa … present	*singa* … present	Predictive	(11)
singa … present/past	*-andi-*	Predictive	(8)/(6)
oba … present/future	agrees with protasis	Non-predictive	(12)/(13)
obanga … present/future	agrees with protasis	Non-predictive	(12)/(13)
nga … present/future	agrees with protasis	Non-predictive	(12)/(13)
ne bwe … *-andi-*	*-andi-*	Concessive	(7)

(9) Bw'onómpíta ndíjja.
bwe **o-no-N-yit-a** N-li-jj-a
if **SP$_{2SG}$-NEAR_FUT-OP$_{1SG}$-invite-IPFV** SP$_{1SG}$-REM_FUT-come-IPFV
'If or when you invite me, I will come.'
(Ashton et al., 1954: 325)

Another common protasis introducer in Luganda conditionals is the conjunction *singa* 'if'. In (10), taken from Bosa (1997), *singa* is used with a verb in the present while its conjunction-less apodosis also carries a verb in the present.[4]

(10) […] era singa nkikola, omulimu gwange nange guba gunfa.
erá **singá** **N-Ø-ki-kól-a** o-mu-límu gu-ange
and **if** **SP$_{1SG}$-PRS-OP$_7$-do-IPFV** AUG$_3$-NP$_3$-job PP$_3$-POSS$_{1SG}$
ná-nge gú-Ø-bá gú-Ø-N-fâ
and-me SP$_3$-PRS-be SP$_3$-PRS-OP$_{1SG}$-die
'[…] and if I do it, I also lose my job (lit. 'my job also dies me').'
(Bosa, 1997: 17)

In (11), taken from Pilkington (1901), *singa* is found both in the protasis and the apodosis, and is used with a present tense verb in both clauses.

(11) Singá ombûlira, singá nsányuka.
singá **o-Ø-N-buulir-a** **singa** N-Ø-sanyuk-a
if **SP$_{2SG}$-PRS-OP$_{1SG}$-tell-IPFV** **if** SP$_{1SG}$-PRS-rejoice-IPFV
'If you tell me, I shall rejoice.'
(Pilkington, 1901: 85-86)

According to Kirwan and Gore (1951: 70), *bwe* is used "only with future and present tenses" and *singa* is used "only with the present". However, as already shown in a sentence like (6), *singa* can also occur in the protasis in conjunction with past tense verbs, while *-andi-* marks the verb in the apodosis. Such conditionals involving *-andi-* in the apodosis are, elsewhere, classified as 'unreality conditionals' and include hypotheticals and counterfactuals (Saloné, 1983b: 312). Both Dancygier (1993, 1998) and Comrie (1986) consider these as hypothetical conditionals with different degrees of hypotheticality. In both (6) and (8) *-andi-* in the apodosis (also called *q*) signals a prediction that is less strongly made because "the speaker holds other assumptions which contradict the assumption given in *p*" (Dancygier, 1993: 409). Traditional Luganda grammarians generally agree that such hypothetical conditional sentences are marked by the conjunction *singa* in the protasis and the verbal prefix *-andi-* in the apodosis (see Ashton et al., 1954: 324; Chesswas, 1963: 85; Crabtree, 1902: 36; Gorju, 1906: 38; Kirwan and Gore, 1951: 69; Le Veux, 1914: 187ff). Ashton et al. (1954: 324) describe these as sentences "which express what might have happened but did not" (counterfactual) or "what could happen but has not" (hypothetical), as in (8), which the authors appear to have inappropriately translated as 'If you had spoken Luganda every day, you would have quickly become an expert'. This translation portrays *-andi-* as marking counterfactuality, while it should be read here as conveying hypotheticality. The protasis verb is not marked for past tense, as in (6) above, where *-andi-* does express counterfactuality.

Apart from *bwe* and *singa*, Le Veux (1917), Kirwan and Gore (1951), Cole (1967) and Snoxall (1967) report other protasis markers, i.e. *oba*, *obanga* and *nga*. One of the most comprehensive lists is provided by Kirwan and Gore (1951: 70), from which (12) and (13) are taken. In (12) both the protasis and apodosis verb are zero-marked for present, while in

[4] This example is presented here to contrast it with example (8), even though it is not taken from a so-called traditional grammar, dictionary or handbook.

(13) both verbs (protasis and apodosis) carry a remote future marker *-li-*. Although they carry the same tense forms as examples (9) to (11), sentences (12) and (13) are to be considered as non-predictive. In (9) to (11), which are predictive, there is a "content domain relation between the assumptions" expressed in the protasis and apodosis (Dancygier, 1993: 423). In (12) and (13), however, despite the simultaneity or sequential order of events, there is no causality. For example, in (12) someone's stealing may not be interpreted as causing his doing wrong, but that the speaker has prior knowledge of the assumption that someone steals, which motivates the speaker's conclusion that he does wrong (cf. Dancygier, 1993: 424).

(12) Obá/obánga/nga ábba, ayónoona.

oba/obanga/nga	**a-Ø-bb-a**	a-Ø-onoon-a
if	**SP_1-PRS-steal-IPFV**	SP_1-PRS-do_wrong-IPFV

'If he steals, he does wrong.'
(Kirwan and Gore, 1951: 70)

(13) Obá/obánga/nga alíbba, alyónoona.

oba/obanga/nga	**a-li-bb-a**	a-li-onoon-a
if	**SP_1-REM_FUT-steal-IPFV**	SP_1-REM_FUT-do_wrong-IPFV

'If he (should) steal, he will be doing wrong.'
(Kirwan and Gore, 1951: 70)

In other conditionals, the protasis is introduced by a concessive conjunction *ne bwe* 'even though, even if' as seen in (7) above. In such constructions, *-andi-* may also occur in the apodosis, at which point it marks counterfactuality in both the protasis and the apodosis.

2.2. The use of -andi- as a modal marker

Kawalya et al. (2014) are the only ones to have explicitly called *-andi-* a modal marker. In their study, which deals almost exclusively with the modal verb *-sóból-*, *-andi-* is shown to be the only marker (out of the six most important modal markers of possibility) that also expresses necessity. In some earlier sources, it is however used as a marker of modality, but not discussed, so its modal meanings need to be inferred from the few isolated examples (see Kiingi, 2009: xx; Le Veux, 1914: 208). Le Veux (1914), who provides several phrases like the one in (14), is no doubt the oldest source where it features as a modal marker. It was translated there as '*il se peut que*' ('it may be that').

(14) Nandibá.
N-andi-ba
SP_{1SG}-UNR-be
Il se peut que je sois.
'It may be that I am.'
(Le Veux, 1914: 208)

Kamoga and Stevick (1968) gloss *-andi-* as 'might', while Kiingi (2009), in the introduction to his monolingual Luganda dictionary, used it in the example in (15), in which it is clearly interpretable as conveying epistemic possibility.

(15) Kyandibá nga Olugánda lúlíná nnántábílá nnákábala omú yekká **-lî**.

ki-andi-ba	nga	o-lu-ganda	lu-Ø-lin-a	Ø-nnantabila
SP_7-UNR-be	that	AUG_{11}-NP_{11}-Ganda	SP_{11}-PRS-have-IPFV	NP_1-verb
nnakabala	o-mu	a-ekka	-li	
genuine	PP_1-one	PP_1-only	-li	

'It might be (the case) that Luganda has only one genuine verb -li.'
(Kiingi, 2009: xx)

3. A corpus-based study of the synchronic uses of *-andi-*

To be able to study the current uses of *-andi-*, we analyzed data from the two most recent time periods of our corpus, that is, the 2000s and 2010s. This sub-corpus contains 1,703,924 tokens (i.e., the 'size' of the corpus, counting all occurrences of all orthographic words) and 164,529 types (i.e., all distinct orthographic words).

Using the WordSmith Tools software suite (WST, cf. Scott, 1996–2017) to query this synchronic corpus, we searched for words containing *andi* and *andy*, the latter being intended to retrieve instances where *-andi-* is attached to vowel-

initial verb forms. The asterisks surrounding the search items are wildcards that represent any number of letters. Given the nature of the search items, the query was bound to generate many undesired forms. We therefore limited our search by excluding most of the undesired material (such as parts of roots like **andika*, **andii** or **andi*, as well as full orthographic words like *atandise* 'he/she has started', *emirandira* 'roots', *okutandika* 'to start' or *awandikibwa* 'he/she is registered') through the "Advanced" feature in WST. Given that there are several thousand instances of *-andi-* in the synchronic corpus, we used standard random sampling techniques within WST in order to obtain a manageable number of concordance lines (i.e., about one hundred per decade) to study. These lines were then exported to an Excel spreadsheet for analysis, tagging, glossing and translation.

The verbal prefix *-andi-* was found to occur in four different structures, viz. in (i) complex predictive conditional constructions, (ii) complex non-predictive conditional constructions, (iii) single-clause predictive conditional constructions with an elided protasis, and in (iv) genuine modal single-clause constructions without an elided protasis. As shown in Fig. 1, *-andi-* is mostly used in genuine single clauses. Extrapolating from the sample used, there are 1029 instances in which *-andi-* is used as such (which corresponds to 65% of *-andi-*'s overall count). It occurs 263 times (16%) in single-clause constructions where the protasis is assumed to be elided, and another 233 times (15%) in complex predictive conditional constructions. Finally, in 59 instances (4%), it occurs in complex non-predictive conditional constructions.

For the description that follows, genuine single-clause constructions, constructions with an elided protasis and complex non-predictive conditionals will together be considered as uses of *-andi-* 'outside canonical conditional constructions' (Section 3.2), as opposed to 'canonical conditional constructions' which correspond to the complex predictive conditionals (Section 3.1).

3.1. The use of -andi- in canonical conditional constructions

We consider here as canonical conditionals those constructions that adhere to both the syntactic and semantic criteria set in Comrie's definition, thus excluding Dancygier's non-predictive conditionals as well as the single-clause predictive conditionals, i.e. those whose protasis is elided (cf. the first category in the legend of Fig. 1). In Luganda canonical conditional constructions, *-andi-* does indeed generally appear in the apodosis, as stated in the existing literature, with a conditional conjunction introducing its protasis. Our corpus study now allows us to look into the distribution of the actual constructions. In 169 instances out of the total number of canonical conditional constructions (i.e., in 72% of the cases), the conjunction introducing the protasis is *singa*, while in 30 instances (13%) the protasis is marked by the auxiliary *-ba* 'be'. This use with *-ba* was not mentioned in the literature. The protasis can also be introduced by the conjunction *nga* 'if', which is the case in only 7 instances (3%). Finally, *-andi-* was also observed to occur in the protasis itself, which is then marked by the conditional conjunctions *ne bwe* 'even if, even though' or *bwe* 'if'. There are 9 instances (4%) with *ne bwe*, and 18 instances (8%) with *bwe*. This distribution is presented in Fig. 2.

The corpus also allows us to look into the (distribution of the) different tense-aspect (TA) environments. As such, *singa* in the protasis can be used with a verb either in the remote past perfective, as in (16), or in the near past perfective, as in (17). As noted by Ashton et al. (1954: 324), such sentences "express what might have happened but did not […]". Thus, following Dancygier (1993, 1998), in for instance (16), the possibility of leaving it at the Ministry of Water and hence also the possibility of other districts taking it, is completely excluded. In line with Section 2, we refer to such constructions as counterfactual. Whether *singa* is used with a verb in the remote past perfective or the near past perfective, *-andi-* in the apodosis combines with a verb in the perfective. In Luganda, the perfective can be formed by suffixing either *-a* or *-ye* to the verb stem, but this

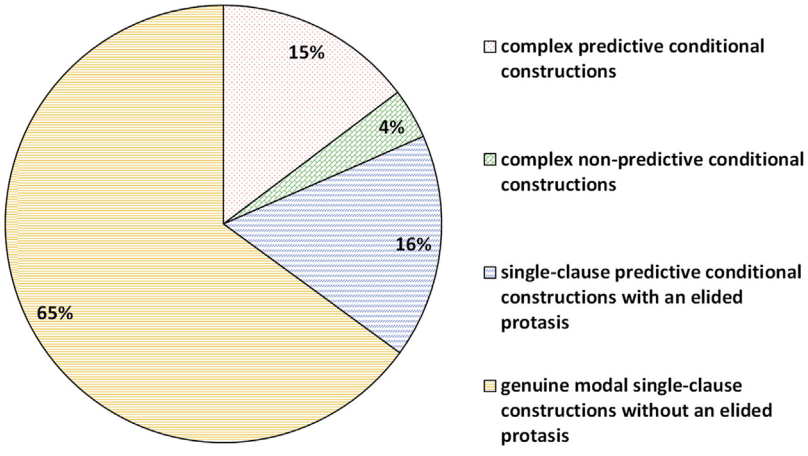

Fig. 1. Environments in which *-andi-* is found, as seen in the present-day corpus.

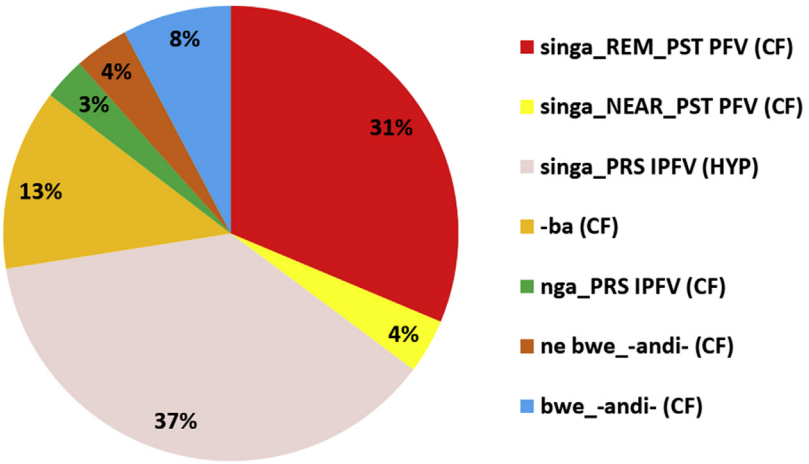

Fig. 2. Use of *-andi-* in canonical conditional constructions, as seen in the present-day corpus.

can cause different changes to the verb-final segment depending mostly on the nature of the final consonant, but also on the length of the verb. Imperfective verb forms, on the other hand, end in *-a*.

(16) Yágámbye nti singá báágíréká kú mínísítúlé y'ámázzi, dísitulikiti endala zándígítútté olwo Nákásóngóla n'évíírámú awó.
a-a-gamb-ye nti **singa** **ba-a-gi-rek-a**
SP$_1$-NEAR_PST-say-PFV that **if** **SP$_2$-REM_PST-OP$_9$-leave-PFV**
ku Ø-minisitule y-a ma-zzi Ø-disitulikiti
LOC$_{17}$ NP$_9$-ministry PP$_9$-CONN NP$_6$-water NP$_{10}$-district
e-N-lala **zi-andi-gi-twal-ye** olwo Nakasongola ne
AUG$_{10}$-NP$_{10}$-other **SP$_{10}$-UNR-OP$_9$-take-PFV** then Nakasongola and
e-va-ir-a-mu a-wa-o
SP$_9$-come_from-APPL-IPFV-LOC$_{18}$ AUG$_{16}$-PP$_{16}$-DEMb
'He said that if they had left it at the Ministry of Water, other districts would have taken it and Nakasongola would get nothing.'
(BU130914-Tebalina, Newspapers, 2010s)

(17) Kubá singá ddala twábáddé náffe túwera twándísóbódde okulágá ábásíru abo ewáabwé.
kuba **singa** ddala **tu-a-ba-ye** na-ffe
because **if** really **SP$_{1PL}$-NEAR_PST-be-PFV** and-us
tu-wer-a **tu-andi-sobol-ye** o-ku-lag-a
SP$_{1PL}$-be_enough-IPFV **SP$_{1PL}$-UNR-manage-PFV** AUG$_{15}$-NP$_{15}$-show-FV
a-ba-siru a-ba-o e-wa-abwe
AUG$_2$-NP$_2$-fool AUG$_2$-PP$_2$-DEMb AUG$_{16}$-PP$_{16}$-POSS$_2$
'Because if we really were also enough, we would have managed to show those fools their home (= hit them).'
(Amagezi amalungi, Plays, 2010s)

In the protasis, *singa* can also appear with a verb in the present imperfective, as in (18). Here, *-andi-* in the apodosis again combines with a verb in the perfective. Unlike (16) and (17), in (18) the possibility of reverting to the traditional upbringing is not completely excluded, and therefore, the proposition marked by *-andi-* in the apodosis is still realizable. In Ashton et al.'s (1954: 324) view, sentences of this kind express "what could happen but has not". In line with Section 2, we refer to these as hypothetical constructions.

(18) […] agamba nti singá túddá kú ŋŋúnjúlá éy'édda twándíbáddé túfuná éggwánga eddúngí.

a-Ø-gamb-a	nti	**singa**	**tu-Ø-dd-a**	ku
SP_1-PRS-say-IPFV	that	**if**	**SP_{1PL}-PRS-return-IPFV**	LOC_{17}
ŋŋunjula	e-y-a	e-dda	**tu-andi-ba-ye**	
NP_9.upbringing	AUG_9-PP_9-CONN	AUG_5-NP_5.long_ago	**SP_{1PL}-UNR-be-PFV**	
tu-fun-a	e-ggwanga	e-ddungi		
SP_{1PL}-get-IPFV	AUG_5-NP_5.nation	AUG_5-NP_5.good		

'[...] he says that if we revert to the traditional upbringing, we would be getting a good nation.'

(Ebibuuzo ku Kimala, Instructional Materials, 2000s)

What is common to sentences (16) and (17), both expressing counterfactuality, is that the verb in the protasis contains a past tense prefix *-a-*. On the other hand, the protasis of sentence (18), which expresses hypotheticality, contains a verb with a zero tense prefix characteristic of the present tense. As Dancygier (1993: 410) shows, there is a relation between hypothetical and counterfactual interpretations and time reference. Where the verb in the protasis contains a past tense prefix as in (16) and (17), a counterfactual reading is triggered and in the absence of this, as in (18), an utterance expresses hypotheticality.

In all these cases, *-andi-* is used with a verb in the perfective and it takes a H (high) tone on both its syllables, except where it is used with a negative marker, as in (19), in which case it carries a H and a L (low) tone, but is still marked for the perfective.

(19) Mugema yawéebwa ekitíibwa kinéne eky'óbwájjájjá bwá Búgánda kubánga ssingá teyalí yê Kimera teyándimanyiddwá n'ákatónó.

Mugema	a-a-wa-ebw-a		e-ki-tiibwa	ki-nene	
Mugema	SP_1-REM_PST-give-PASS-PFV		AUG_7-NP_7-title	PP_7-big	
e-ki-a	o-bu-a-jjajja		bu-a		
AUG_7-PP_7-CONN	AUG_{14}-NP_{14}-Ø-grandparent		PP_{14}-CONN		
Buganda	kubanga	**singa**	**te-a-a-li**	ye	Kimera
Buganda	because	**if**	**NEG-SP_1-REM_PST-be**	him	Kimera
te-a-andi-many-ibw-ye		ne	a-ka-tono		
NEG-SP_1-UNR-know-PASS-PFV		and	AUG_{12}-NP_{12}-small		

'Mugema was given the big title of 'Grandfather of Buganda' because if it had not been for him, Kimera would not have been known at all.'

(Ebyafaayo 2, Historical Texts, 2000s)

When *-ba* 'be' is used to mark the protasis of a conditional construction, it does so as an auxiliary that is followed by the main verb in the infinitive, as in (20), in which case *-andi-* always expresses counterfactuality. The verb *-ba* is deficient and can never be marked for remote past tense in Luganda. As an auxiliary marking the protasis of a counterfactual conditional, it can only be inflected for person. This is the only context in Luganda where the protasis verb is not overtly marked for past tense, but the sentence still conveys counterfactuality. Given that the effect of the auxiliary *-ba* is similar to that of an overtly marked past tense verb in the protasis of a predictive conditional construction, it may as well be argued that *-ba* has an inherent past time reference.

(20) Omusájjá ono abá kúbéerá múbísi ngá abálálá bé ndábyé eyo gyé mpísê ennyúmbá yé yándígízímbyé eyo mu bikko obá ku mbálámá z'émigga obá ennyánja […]

o-mu-sajja	o-no	**a-ba**	**ku-beer-a**	mu-bisi	nga	
AUG_1-NP_1-man	PP_1-DEMa	**SP_1-be**	**NP_{15}-be-IPFV**	NP_1-dense	as	
a-ba-lala	ba-e	N-lab-ye	e-o	gi-e		
AUG_2-PP_2-other	PP_2-REL	SP_{1SG}-see-PFV	PP_{16}-DEMb	PP_{23}-REL		
N-yit-ye	e-nnyumba	ya-e				
SP_{1SG}-pass-PFV	AUG_9-NP_9.house	PP_9-$POSS_1$				
a-andi-gi-zimb-ye	e-o	mu	bi-kko	oba		
SP_1-UNR-OP_3-construct-PFV	PP_{16}-DEMb	LOC_{18}	NP_8-valley	or		
ku	N-balama	zi-a	e-mi-gga	oba		
LOC_{17}	NP_{10}-bank	PP_{10}-CONN	AUG_4-NP_4-river	or		
e-nnyanja						
AUG_{10}-NP_{10}.lake						

'If this man had been primitive like the others I have seen on my way, he would have constructed his house in the valleys or on the banks of rivers or lakes […]'

(Emmunyeenye, Instructional Materials, 2000s)

The verb *-ba* is also found as a copula in the protasis of conditional constructions whose apodosis verb is marked by *-andi-*, as in (21), where it is also inflected for person only. As in (20), it appears impossible to realize the proposition in the protasis. The reading of the sentence still remains counterfactual. No verb other than *-ba* is found in the protasis of a conditional construction in the absence of a dedicated conditional conjunction. In conditionals where *-ba* functions as a copula, the protasis appears to be inherently counterfactual. Declerck and Reed (2001: 100), following Goodman (1991), call these types of conditionals 'counteridentical-P conditionals'; the protasis "identifies two incompatible entities with each other".

(21) Nóólwékyo mbá ggwe nándígenzé néékennéényá buli awáli ettééka.
noolwekyo **N-ba** ggwe **N-andi-gend-ye** N-eekenneeny-a
therefore **SP_{1SG}-be** you **SP_{1SG}-UNR-go-PFV** SP_{1SG}-search-IPFV
buli a-wa-li e-tteeka
every AUG_{16}-PP_{16}-be AUG_5-NP_5.rule
'Therefore if I were you, I would have looked wherever there was a rule.'
(Syntactical, Instructional Materials, 2010s)

The conjunction *nga* 'if', was found to be used in the protasis of a conditional sentence with a verb in the present imperfective, as illustrated in (22). However, contrary to previous examples with present tense verb forms, the entire sentence here is interpretable as expressing counterfactuality. This may be due to the fact that temporal reference of the verb is likely to be dependent on the type of the verb (Dancygier, 1993: 410); state verbs (in this case *-li* 'be') tend to have past time reference, while event verbs tend to refer to the present or future. Therefore, in (22) where a state verb (with past time reference) is used, *nga* introduces the protasis of a predictive counterfactual conditional, whereas in (12) and (13) where an action verb is used, it introduces the protasis of a non-predictive conditional.

(22) Erá túJja kulágá éngérí ómúlábe gy'ásémbéréddé né Kábáka waffe mu ngérí éy'óbúlábe erá etándisobosé nga Bugánda térí mu Buwâmbé
era tu-Ø-jj-a ku-lag-a e-N-geri
also SP_{1PL}-PRS-come-IPFV NP_{15}-show-FV AUG_9-NP_9-way
o-mu-labe gi-e a-Ø-sember-er-ye ne Ø-kabaka
AUG_1-NP_1-enemy PP_9-REL SP_1-PRS-come_close-APPL-PFV with NP_1-king
wa-affe mu N-geri e-a o-bu-labe
PP_1-$POSS_{1PL}$ LOC_{18} NP_9-way PP_9-$CONN_9$ AUG_{14}-NP_{14}-danger
era **e-te-andi-sobok-ye** **nga** Buganda
and **SP_9-NEG-UNR-be_possible-PFV** **if** Buganda
te-Ø-li mu bu-wambe
NEG-PRS-be LOC_{18} NP_{14}-siege
'We will also show how the enemy has come close to our King in a dangerous way, which would not have been possible if Buganda had not been under siege.'
(OccupiedBuganda_20061228, Political Documents, 2000s)

When *-andi-* occurs in the protasis of a conditional sentence, the apodosis can equally be marked by *-andi-*, as in (23), but it may also only occur in the protasis as in (24). In such sentences (where *-andi-* is used in the protasis), no other conjunctions than *(ne) bwe* are allowed. At the same time, when *ne bwe* occurs in the protasis, the sentence is semantically interpretable as a concessive conditional, whether or not it combines with *-andi-*. The combination with *-andi-* in (23), which appears to provide counterevidence to the fact that the player was on the team, makes the entire sentence counterfactual. In (24), *bwe* combines with *-andi-* to exclude the possibility of the proposition in the protasis, hence also rendering the entire sentence counterfactual.

(23) Mayánja yátégéézézzâ nti obóolyâwo omuzánnyí ono né bwé yándíbáddé ku ttíimú eno tewálí ky'amáanyi nnyó kyandikyuséémû.
Mayanja a-a-tegeez-ye nti oboolyawo o-mu-zannyi
Mayanja SP_1-REM_PST-say-PFV that maybe AUG_1-NP_1-player
o-no **ne** **bwe** **a-andi-ba-ye** ku Ø-ttiimu e-no
PP_1-DEMa **even** **if** **SP_1-UNR-be-PFV** LOC_{17} NP_9-team PP_9-DEMa
te-wa-li ki-a ma-anyi nnyo **ki-andi-kyuk-ye-mu**
NEG-PP_{16}-be PP_7-CONN NP_6-value much **SP_7-UNR-change-PFV-LOC_{18}**
'Mayanja said that maybe even if this player had been on this team, nothing much would have changed.'
(ED111010-Mayanja, Newspapers, 2010)

(24) Abakúúmí ábááli munda bwe bándíróbéddé ku kwétegérézá ámáyínjá gyé gávâ, olwo nga bano báyingira.

a-ba-kuumi	a-ba-a-li		mu-nda
AUG_2-NP_2-guard	AUG_2-PP_2-REM_PST-be		NP_{18}-inside
bwe	**ba-andi-rob-er-ye**	ku	ku-etegerez-a
if	**SP_2-UNR-focus-APPL-PFV**	LOC_{17}	NP_{15}-observe-FV
a-ma-yinja	gi-e	ga-Ø-v-a	olwo_nga
AUG_6-NP_6-stone	PP_{23}REL	SP_6-PRS-come_from-IPFV	then
ba-no	ba-Ø-yingir-a		
PP_2-DEMa	SP_2-PRS-enter-IPFV		

'If the guards who were inside had focused on observing where the stones were coming from, then these ones [= people] would enter.'
(Buwuula, Novels, 2000s)

Table 2 offers a summary of our corpus-based account of *-andi-* in canonical conditional constructions, showing the specific structures in which it occurs together with their corresponding meanings.

Our systematic corpus analysis has thus revealed that in present-day Luganda, *-andi-* occurs in the apodosis of complex predictive conditionals with either the conditional conjunctions *singa* or *nga*, or with the auxiliary *-ba* in the protasis. In some cases, *-andi-* itself also appears in the protasis but only when it combines with the conjunctions *bwe* or *ne bwe*. The latter is moreover solely found in concessive conditionals.

In conjunction with *singa* in the protasis, its specific reading depends on the tense of the protasis verb: hypothetical when the latter is zero-marked for present tense, counterfactual when it is marked for past tense. A protasis verb zero-marked for present tense has been found to always be imperfective. The use of a present perfective verb in a protasis marked by *singa*, which would be grammatical and has previously been reported in Luganda grammars, as seen in (8), was not retrieved from the present-day corpus sample. As we will see in Fig. 5 further below, and the discussion accompanying it, this particular construction with *-andi-* has basically not been used anymore since the 1950s.

The protasis marker *-ba* as an auxiliary followed by the main verb in the infinitive always triggers a counterfactual instantiation of *-andi-*. Such is also the case when *-ba* is used as a copula.

For all these canonical conditional constructions, *-andi-* in the apodosis always combines with a verb marked for perfective aspect, carrying a H tone on both its syllables. Only one exception was found: when *-andi-* combines with a negative verb form, it carries a H tone on its first syllable and a L tone on its second.

From the foregoing discussion it can therefore be said that the use of a past tense with a conditional conjunction (as a marker of unreality) in the protasis triggers a counterfactual interpretation of *-andi-* in the apodosis and, indeed, of the entire conditional construction. As put by Dancygier (1993: 410), the past is associated with counterfactuality (strong hypotheticality), since "the past is certainly not subject to change". It therefore appears impossible with a past tense marked protasis, to realize the assumption or proposition in the protasis. This is also the case with a present tense protasis verb which has a past time reference as in (20) and (21). With a present tense protasis verb, there is simply an unlikelihood (but not impossibility), whereby hypotheticality is triggered because the assumption in the protasis, and thus also the prediction in the apodosis, is still realizable.

3.2. The use of *-andi-* outside canonical conditional constructions

In addition to the use of *-andi-* in canonical conditional constructions, the verbal prefix *-andi-* is also used in sentences that structurally behave as conditional constructions but are considered by some as 'pseudo-conditionals', since they do not conform to the causal link criterion (between the protasis and the apodosis). These are equivalent to Dancygier's non-predictive conditionals, of which there are 59 instances (cf. the second category in the legend of Fig. 1). In 27 of these instances, the protasis is introduced by *singa* used with a verb in the present imperfective, and in the other 32, the protasis is introduced by the conjunction *bwe*, also used with a verb in the present imperfective.

Table 2
Use of *-andi-* in canonical conditional constructions, as seen in the present-day corpus.

Protasis		Apodosis		Type of conditional	Meaning	Example
Marker	TA of verb	Aspect of verb	Tone of *-andi-*			
singa	REM_PST PFV	PFV	HH	Predictive	CF	(16), (19)
singa	NEAR_PST PFV	PFV	HH	Predictive	CF	(17)
singa	PRS IPFV	PFV	HH	Predictive	HYP	(18)
-ba	INF	PFV	HH	Predictive	CF	(20)
-ba	as copula	PFV	HH	Counteridentical-P	CF	(21)
nga	PRS IPFV	PFV	HH	Predictive	CF	(22)
ne bwe	*-andi-*	PFV	HH	Concessive	CF	(23)
bwe	*-andi-*	[no *-andi-*]		Predictive	CF	(24)

In addition to these two types of pseudo-conditionals or non-predictive conditionals, there are 263 instances where *-andi-* is used in single-clause constructions whose protases are assumed to be elided (cf. the third category in the legend of Fig. 1). Of the 1029 instances where *-andi-* is used in genuine single-clause constructions without an assumed elided protasis (cf. the fourth category in the legend of Fig. 1), 779 verbs to which *-andi-* is attached are in the perfective, with another 250 in the imperfective. Fig. 3 provides a summary of this distribution.

In the case of non-predictive conditionals, the subordinate clause is considered as a pseudo-protasis, and the main clause, marked here by *-andi-*, as a pseudo-apodosis (see Kay and Michaelis, 2012 for a more detailed analysis). Examples are shown in (25) and (26), where the protasis is introduced by *singa* and *bwe* respectively. As may be seen, the protasis indeed takes a present imperfective verb, while *-andi-* in the apodosis marks, as usual, a verb taking the perfective ending. In addition to lacking a causal link, there is also no backshift. The present tense verb in the protasis refers to the present. In a canonical conditional construction, the combination of *-andi-* in the apodosis with a present tense verb introduced by *singa* in the protasis would trigger hypotheticality. Here *-andi-* always expresses deontic necessity. As shown by Dancygier (1993: 417), there seems to be little or no relation between the two clauses of complex non-predictive conditionals; they appear to be formed independently of each other before they later form one construction. Although the protasis verbs in both (25) and (26) are in the present, this does not seem to affect the interpretation of *-andi-* as they could potentially be in the past or future with *-andi-* still expressing deontic necessity. Therefore, these constructions seem to only be structurally identical with complex predictive conditionals, but their interpretations are not based on this complex structure. Thus, the fact that *-andi-* expresses deontic necessity in these constructions, where it is always used with a verb in the perfective, could be due to a correlation between perfectivity and deontic modality as, for instance, hypothesized by Abraham and Leiss (2008: xiii). Quoting Bybee et al. (1994), Ziegeler (2006) and Narrog (2008), Squartini (2016: 56) suggests that deontics are future-oriented because they "refer to a state of affairs that does not exist at the present …" and that since futurity and perfective aspect are correlated, there is "an indirect relationship between perfectivity and deontic modality via futurity".[5]

(25) N'ábábáká bá Pálamenti "abájéémera" ekibíiná kyá NRM nabó teyábatalizza erá singá kísoboka nabó bándíyánguye "okwénenyá" […]

ne	a-ba-baka	ba-a	Ø-palamenti	
and	AUG_2-NP_2-representative	PP_2-CONN	NP_9-parliament	
a-ba-jeem-er-a		e-ki-biina	ki-a	NRM
AUG_2-PP_2-disobey-APPL-IPFV		AUG_7-NP_7-party	PP_7-CONN	NRM
na-bo	te-a-a-ba-taliz-ye		era	**singa**
and-them	NEG-SP_1-NEAR_PST-OP_2-spare-PFV		and	**if**
ki-Ø-sobok-a		na-bo	**ba-andi-yanguw-ye**	
SP_7-PRS-be_possible-IPFV		and-them	**SP_2-UNR-hurry-PFV**	
o-ku-eneny-a				
AUG_{15}-NP_{15}-apologize-FV				

'And the MPs who disobey the NRM [5] party, he warned them too; and if it is possible, they should also apologize quickly […]'

(ED131014-Kino, Newspapers, 2010s)

(26) Bwe kába ng'akanyóólábíkyá káva ku ntápútá yá mátééká gá nsî, nsuubira Alúpo yándíddúkíddé mú ófíísí yá muwábúzí wá Gávúmênti ku by'ámátéékâ (Solicitor General).

bwe	ka-ba	nga	a-ka-nyoolabikya	**ka-Ø-v-a**
if	SP_{12}-be	that	AUG_{12}-NP_{12}-standoff	**SP_{12}-PRS-come_from-IPFV**
ku	N-taputa	y-a	ma-teeka	ga-a
LOC_{17}	NP_9-interpretation	PP_9-CONN	NP_6-law	PP_6-CONN
N-si	N-Ø-suubir-a		Alupo	**a-andi-dduk-ir-ye**
NP_9-country	SP_{1SG}-PRS-think-IPFV		Alupo	**SP_1-UNR-run-APPL-PFV**
mu	ofiisi	y-a	mu-wabuzi	w-a	gavumenti
LOC_{18}	office	PP_9-CONN	NP_1-advisor	PP_1-CONN	government
ku	bi-a	a-ma-teeka			
LOC_{17}	PP_8-CONN	AUG_6-NP_6-law			

'If the standoff originates from the interpretation of the country's laws, I think Alupo should go to the advisor of government on legal issues (Solicitor General).'

(BU130602-Minisita, Newspapers, 2010s)

[5] NRM is short for the National Resistance Movement, a political party in Uganda.

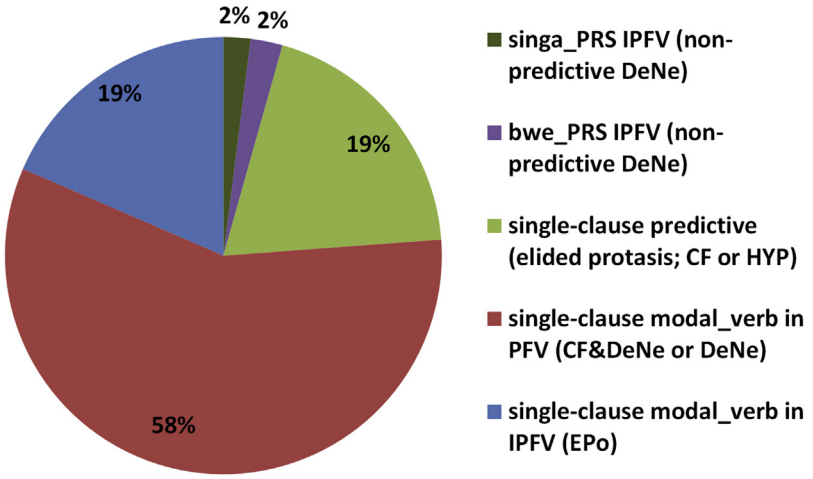

Fig. 3. Use of *-andi-* outside canonical conditional constructions, as seen in the present-day corpus.

Deontic modality is traditionally defined in terms of permission and obligation (Palmer, 1986). However, in order to pinpoint deontic uses of *-andi-*, it is necessary to consider deontic modality beyond this traditional sense. We therefore consider a more general understanding of deontic modality as an indication of the degree of moral desirability (Nuyts, 2006; Nuyts et al., 2010; Van linden and Verstraete, 2011). Nuyts et al. (2010: 18) stress that deontic modality should be defined in terms of "an assessment of the degree of moral acceptability of the SoA [state of affairs]", rather than in terms of permission and obligation, which are directive uses. Indeed, all the cases we consider to be deontic necessity uses of *-andi-* hardly involve any directivity or obligation, but are all the same still deontic, since they "are about things being 'good' or 'bad'" (Nuyts et al., 2010: 18). Moreover, Nuyts et al. (2010) expound their use of the term 'morality' as not (only) involving generally accepted social or societal principles or 'ethical norms', but also involving personal opinions and principles, as many of our examples show.

Turning to *-andi-* in single-clause constructions, we first note that in such constructions it takes the same conjugations as those it takes when used in complex conditional constructions. It can occur with a verb in the perfective thereby carrying a H tone on both its syllables, but also with a verb in the imperfective, whereby it takes a L tone on both syllables. With a verb in the perfective, *-andi-* can trigger either counterfactuality, as in (27), or hypotheticality, as in (28). These constructions where *-andi-* triggers either counterfactuality or hypotheticality have much in common, at least semantically, with the conventional conditional constructions discussed in Section 3.1. Following Lazard (2001) and Van linden and Verstraete (2008), we consider them to be conditional apodoses with an elided protasis (e.g. in (27), *if the patient had got a blood transfusion*, he would have got well quickly).

(27) Yee mu ddwâliro twávúddéyó jjô até tebáámutaddekó musááyí nga tewálí só kyándímúyámbye okubá obûlungí.

yee	mu	ddwaliro	tu-a-vu-ye-yo	jjo
yes	LOC_{18}	NP_5.hospital	SP_{1PL}-NEAR_PST-come_from-PFV-there	yesterday
ate	te-ba-a-mu-teek-ye-ko		mu-saayi	nga
and	NEG-SP_2-NEAR_PST-OP_1-put-PFV-LOC_{17}		NP_3-blood	as
te-wa-Ø-li	so	**ki-andi-mu-yamb-ye**		o-ku-ba
NEG-LOC_{16}-PRS-be	yet	**SP_7-UNR-OP_1-help-PFV**		AUG_{15}-NP_{15}-be
o-bu-lungi				
AUG_{14}-NP_{14}-well				

'Yes we came out of the hospital yesterday and they didn't give him blood because there was none, yet it would have helped him to get well.'
(Ekkomera eriggule 6, Plays, 2000s)

(28) Alímú ekirúngó ekíyámba okusála amasávu agándíbáddé gásígálá mu mubírí okúgézzá ómúntú, naddala ku bakázi.

a-li-mu	e-ki-rungo		e-ki-yamb-a
SP_1-be-LOC_{18}	AUG_7-NP_7-substance		AUG_7-PP_7-help-IPFV
o-ku-sal-a	a-ma-savu		**a-ga-andi-ba-ye**
AUG_{15}-NP_{15}-reduce-FV	AUG_6-NP_6-fat		**AUG_6-PP_6-UNR-be-PFV**
ga-sigal-a	mu	mu-biri	o-ku-gezz-a
SP_6-remain-IPFV	LOC_{18}	NP_3-body	AUG_{15}-NP_{15}-make_fat-FV
o-mu-ntu	naddala	ku	ba-kazi
AUG_1-NP_1-person	especially	LOC_{17}	NP_2-woman

'It contains a substance which helps to reduce fats that would remain in the body to make a person fat especially in women.'
(BU110325-Wayini, Newspapers, 2010s)

What is more, *-andi-* can trigger both counterfactual and deontic necessity meanings in one construction, as shown in (29). However, unlike in the above cases where an elided protasis is assumed, cases like these are simply single-clauses with no reason to regard them as conditional apodoses with elided protases. Van linden and Verstraete (2008: 1889) show that although there are many languages which structurally distinguish between simple counterfactuals (29) and conditional counterfactuals with an elided protasis (27), there are also languages where the two are structurally identical. In Luganda, these seem to be structurally identical and context, therefore, helps in differentiating between them. A conditional counterfactual with an elided protasis, as in (27), receives some kind of conditional interpretation.

(29) Nóólwékyo bándísóósé kúbátegékérá mu kifó ky'ókúbágobágányá ng'êbyónziira!

noolwekyo	**ba-andi-sook-ye**		ku-ba-tegek-er-a
therefore	**SP_2-UNR-do_first-PFV**		NP_{15}-OP_2-plan-APPL-FV
mu	ki-fo	ki-a	o-ku-ba-gobagany-a
LOC_{18}	NP_7-place	PP_7-CONN	AUG_{15}-NP_{15}-OP_2-chase-FV
inga	e-bi-onziira		
like	AUG_8-NP_8-useless_person		

'Therefore they should have planned for them first, instead of chasing them like useless people!'
(ED110912-Ababaka, Newspapers, 2010s)

Similar single-clause constructions (i.e., without an elided protasis) may also express only deontic necessity. An example of these is given in (30). In (29), in addition to the speaker giving an opinion or advice on how the situation ought to be (or to have been), i.e. planning for the people before chasing them, the utterance also emphasizes that there was actually no such planning for the people before they chased them. In contrast, in (30), the speaker is simply advising on what should be done, and not emphasizing what has actually not happened.

(30) Nze mbáddê ndowooza nti twándyékébézzá okukákásá bwé túyímíríddé mu by'ákáwúka akó […]

nze	N-ba-dde	N-lowooz-a	nti	**tu-andi-e-kebez-ye**	
I	SP_{1SG}-be-PFV	SP_{1SG}-think-IPFV	that	**SP_{1PL}-UNR-REFL-test-PFV**	
o-ku-kakas-a	bwe	tu-yimirir-ye	mu	bi-a	
AUG_{15}-NP_{15}-be_sure-FV	how	SP_{1PL}-stand-PFV	LOC_{18}	PP_8-CONN	
a-ka-wuka	a-ka-o				
AUG_{12}-NP_{12}-virus	AUG_{12}-PP_{12}-DEMb				

'I am of the view that we should test (ourselves) to be sure of our status regarding the virus […]'
(Obuteesigangana 17, Plays, 2010s)

Finally, when *-andi-* occurs in single-clause constructions with a verb in the imperfective, as in (31), it expresses epistemic possibility. Epistemic possibility is a non-controversial category of modality in terms of its definition. It is generally understood as "expressing a speaker's lack of confidence in the proposition expressed" (Palmer, 2001: 34), or the expression of an uncertain judgment of the proposition by the speaker (van der Auwera and Plungian, 1998: 81). In (31), for example, the speaker thinks, but cannot commit him/herself to the truth of the fact, that in future there will not be people knowledgeable on important issues. Just as the world's languages commonly manifest a relationship between perfectivity and deontic modality (cf. supra), a similar link has been observed between imperfectivity and epistemic modality. At least in languages such as English, the (progressive) imperfective marker is reported to be triggering an epistemic reading due to its focusing on the "internal phases of the situation" (Squartini, 2016: 56).

(31) Abántú ábámányí ebíntú bino batónó; até n'ábo abatono bátandise okufâ; gye bújjá twandibulwa abámányí eby'ênsóngá.

a-ba-ntu	a-ba-manyi	e-bi-ntu	bi-no	ba-tono	
AUG_2-NP_2-person	AUG_2-PP_2-know	AUG_8-NP_8-thing	PP_8-DEMa	PP_2-few	
ate	ne	a-ba-o	a-ba-tono	ba-tandik-ye	
and	even	AUG_2-PP_2-DEMb	AUG_2-PP_2-few	SP_2-start-PFV	
o-ku-f-a	gi-e	bu-Ø-jj-a			
AUG_{15}-NP_{15}-die-FV	PP_{23}-REL	SP_{14}-PRS-come-IPFV			
tu-andi-bulw-a	a-ba-manyi	e-bi-a			
SP_{1PL}-UNR-not_have-IPFV	AUG_2-PP_2-know	AUG_8-PP_8-CONN			
e-N-songa					
AUG_9-NP_9-issue					

'People who know these things are few; and even those few have started dying; in the future we may not have people knowledgeable on important issues.'
(Emmunyeenye, Instructional Materials, 2000s)

Table 3
Use of *-andi-* outside canonical conditional constructions, as seen in the present-day corpus.

Subordinate clause		Main clause		Type of conditional	Meaning	Example
Conjunction	TA of verb	Aspect of verb	Tone of *-andi-*			
singa	PRS IPFV	PFV	HH	Non-predictive	DeNe	(25)
bwe	PRS IPFV	PFV	HH	Non-predictive	DeNe	(26)
[elided protasis]	–	PFV	HH	Predictive	CF	(27)
[elided protasis]	–	PFV	HH	Predictive	HYP	(28)
Genuine single				Type of conditional	Meaning	Example
–	–	PFV	HH	–	CF&DeNe	(29)
–	–	PFV	HH	–	DeNe	(30)
–	–	IPFV	LL	–	EPo	(31)

Table 3 summarizes *-andi-*'s usage outside canonical conditional constructions, showing the structures in which it occurs together with their corresponding meanings.

4. A corpus-based study of the diachronic evolution of *-andi-*

Table 4 shows the composition of the 4-million-word diachronic corpus used for the historical analysis of *-andi-*. It comprises materials from thirteen time periods, i.e. 1890s–2010s.

Samples of about one hundred lines each were taken from and analyzed for each decade separately. The samples for the 2000s and 2010s are the same ones which, jointly, formed the basis for the discussion in Section 3.

Overall, and as seen in Fig. 4, we notice that although there are some fluctuations in the frequency distribution, with fewer occurrences of *-andi-* in the 1900s–1910s and 1970s, and more occurrences in the 1930s–1940s, the overall frequency of *-andi-* is rather stable. As indicated by the trendline: on average it occurs 10 times for every 10,000 words in the corpus (or more precisely, '10 times for every 10,000 tokens').

For each decade anew, we looked at all possible structures in which *-andi-* is involved. The resulting diachronic structural distribution of *-andi-* is presented in Fig. 5. In this one single graph, the use of *-andi-* both *in* and *outside* canonical conditional constructions is shown using so-called '100% stacked columns', meaning that the percentage contribution of each construction to the total per decade is shown. In Section 3 we observed the close correlation between structure and semantics, whereby the former implies the latter. In this section we can therefore suffice with a discussion of the structural level, bringing in semantics on the fly.

Studying Fig. 5, we notice that the use of *-andi-* in genuine single clauses (i.e., those labeled with 'single-clause modal') grows over time compared to the other uses. The use with a verb in the imperfective and thus expressing epistemic possibility, which is first attested in the 1940s, occurring about 0.7 times for every 10,000 words, occurs up to 1.5 times for every 10,000 words in the 2010s. With a verb in the perfective and thus expressing deontic necessity, its frequency is 1.8 times for every 10,000 words in the 1890s, while it is 5.4 times for every 10,000 words in the 2010s. Cases where *-andi-* is used in single-clause constructions but with an assumed elided protasis (i.e., those labeled 'single-clause predictive') have always been relatively frequent, namely about 2 times for every 10,000 words.

Conversely, cases in which *-andi-* is used in complex conditional constructions, either predictive or non-predictive, containing both a protasis and an apodosis, viz. all constructions in Fig. 5 apart from the latter three, reduce over time compared to the other uses.

The clearest case of a vanishing category is the top one in Fig. 5, i.e. the predictive counterfactual conditional whose protasis is marked by the conjunction *singa* and which has a verb in the remote past perfective (cf. Table 2). In the 1890s, this

Table 4
Period distribution in the diachronic Luganda corpus.

Period	Tokens	%	Files
1890s	39,538	0.98	5
1900s	310,548	7.66	8
1910s	228,198	5.63	6
1920s	144,776	3.57	11
1930s	293,433	7.24	15
1940s	120,395	2.97	24
1950s	413,398	10.20	22
1960s	219,428	5.41	17
1970s	167,377	4.13	7
1980s	243,978	6.02	11
1990s	168,746	4.16	12
2000s	724,317	17.87	72
2010s	979,607	24.17	2208
TOTAL	**4,053,739**	**100.00**	**2418**

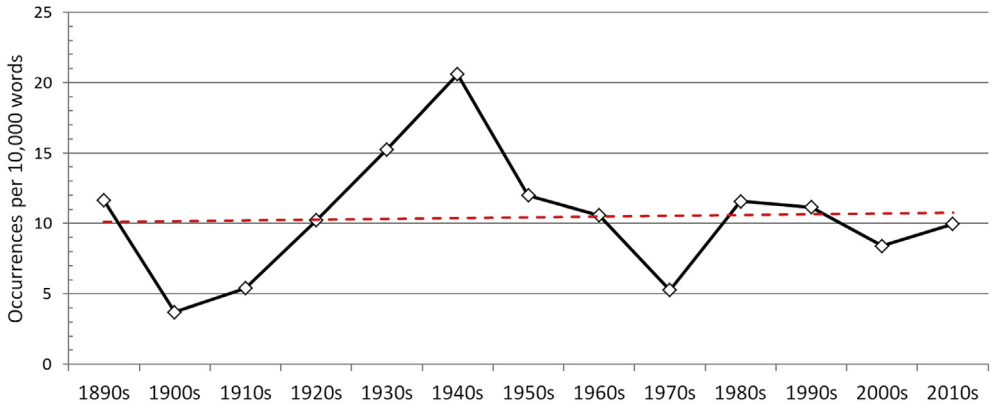

Fig. 4. Overall use of *-andi-* across time.

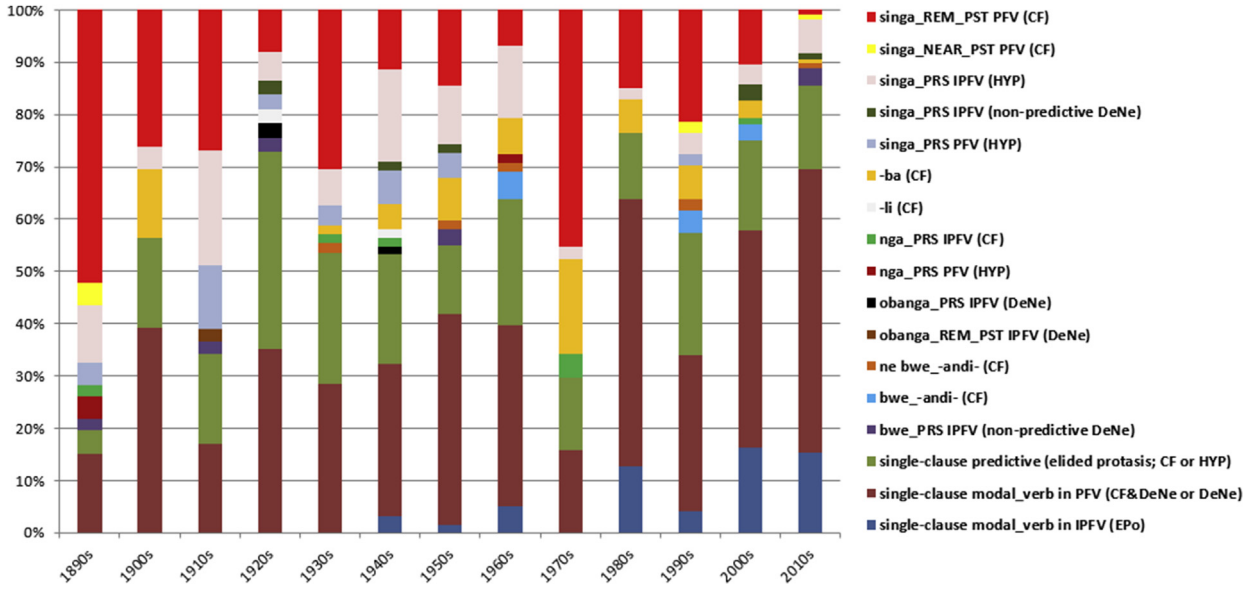

Fig. 5. Diachronic structural (and implied semantic) distribution of *-andi-*.

construction occurs 6.1 times for every 10,000 words and represents by far the principal functional context of *-andi-*, i.e. more than 50% of its usages. Overall, it has kept reducing over time and in 2010s it occurs only about 0.1 times for every 10,000 words.

The other predictive counterfactual conditional construction with *-andi-* in the apodosis, involving the use of *singa* with a verb in the near past perfective in the protasis (cf. Table 2), i.e. the second one from the top in Fig. 5, is only seen in the 1890s, 1990s and 2010s, occurring respectively 0.5 times for every 10,000 words, 0.2 times for every 10,000 words and 0.1 times for every 10,000 words. Clearly, this is a very infrequent use overall, so rare that it was found to be used in just three decades and reappearing after a full century since its first appearance in the 1890s.

The third type of conditional construction where *-andi-* in the apodosis co-occurs with *singa* in the protasis, but this time with a verb in the present imperfective, i.e. the third and fourth ones from the top in Fig. 5, can be either predictive or non-predictive (cf. Tables 2 and 3). In the predictive ones, *-andi-* conveys hypotheticality; in the non-predictive ones, deontic necessity. The predictive ones occur from the 1890s onwards and remain relatively significant throughout the decades, although their frequency is shrinking overall. They occur 1.26 times for every 10,000 words in the 1890s and peak in the 1940s with 3.65 occurrences for every 10,000 words to then remain at only 0.65 occurrences for every 10,000 words in the 2010s. The non-predictive ones are very marginal. Prior to the 2000s, they are attested in only three decades, i.e. the 1920s, 1940s and 1950s, occurring 0.28, 0.33 and 0.19 times for every 10,000 words, respectively. They then resurface in the 2000s and 2010s, occurring respectively 0.25 and 0.10 times for every 10,000 words. The diachronic development of the use of this structure (i.e. *singa* with a verb in the present imperfective) in non-predictive conditionals seems to go in the opposite direction of its use in predictive conditionals. In the former usage, it is seen to reduce, such that after the 1960s, it only occurs

less than once for every 10,000 words, as if to give way to non-predictive uses for which there is no single attestation seen in eight out of the first 11 decades covered by the corpus.

Although the auxiliary *-ba* as a marker of the protasis in predictive conditional constructions with *-andi-* in the apodosis (cf. Table 2) was attested in ten out of thirteen decades, its overall frequency is rather low, always occurring less than once for every 10,000 words.

The conjunction *bwe* used together with *-andi-* in the protasis only, expressing counterfactuality as part of a predictive conditional (cf. Table 2), was found in three decades, viz. the 1960s, 1990s and 2000s, while its concessive counterpart *ne bwe* (cf. Table 2) was found in five decades, viz. 1930s, 1950s, 1960s, 1990s and 2010s. The former occurs about 0.5 times for every 10,000 words, while the latter occurs about 0.25 times for every 10,000 words, in each of those decades. The non-predictive conditional construction whose protasis is introduced by *bwe* and followed by a verb in the present imperfective and whose apodosis is marked by *-andi-* expressing deontic necessity (cf. Table 3), is attested in five decades, viz. 1890s, 1910s, 1920s, 1950s and 2010s, but in very low frequencies in all these decades, the highest being 0.4 times for every 10,000 words in the 1950s.

Then there are constructions which have basically stopped being used some time ago. A clear case is where *singa* in the protasis is used with a verb in the present perfective: while these are generally rare, they are attested in the earlier periods, from the 1890s through to the 1950s, where this construction still occurs 0.6 times for every 10,000 words. After the 1950s, this construction is only sighted again in a single decade, namely the 1990s, with an even lower frequency of 0.2 times for every 10,000 words. A corpus example from the 1890s conveying hypotheticality is given in (32); it corresponds with the one in (8) reported in Ashton et al.'s (1954: 324) grammar.

(32) Ebigámbó ebyo ngá birúngi! fená singá túbíkúte, twándyésímyé nyô.

e-bi-gambo	e-bi-o	nga	bi-lungi	fena	
AUG_8-NP_8-word	AUG_8-PP_8-DEMb	as	PP_8-good	we_all	
singa	**tu-Ø-bi-kwat-ye**		**tu-andi-esiim-ye**	nnyo	
if	**SP_{1PL}-PRS-OP_8-understand-PFV**		**SP_{1PL}-UNR-be_happy-PFV**	very	

'Those words are good! If we all understood them, we would be very happy.'
(Anoonya, Religious Texts, 1890s)

Similarly, the auxiliary *-li* was found as a protasis introducer to express counterfactuality, as in (33), only in the 1920s and 1940s, and this in very low frequencies of about 0.3 times for every 10,000 words.

(33) Kítegérékéká mángú nga awátálí kubá na matéká kyándíbádé kizíbú námúnkúkúmbó wábantú ókúbêrá áwámû.

ki-Ø-teger-ekek-a			mangu	nga	**a-wa-ta-li**
SP_7-PRS-understand-NEUT-IPFV			quickly	that	**AUG_{16}-PP_{16}-NEG-be**
ku-ba	na	ma-teka	**ki-andi-ba-ye**		ki-zibu
NP_{15}-be	with	NP_6-law	**SP_7-UNR-be-PFV**		NP_7-difficult
namunkukumbo	wa-a		a-ba-ntu		o-ku-beer-a
multitude	PP_{16}-CONN		AUG_2-NP_2-person		AUG_{15}-NP_{15}-stay-FV
a-wa-mu					
AUG_{16}-PP_{16}-together					

'It is easily understandable that if there were no laws, it would have been difficult for a large number of people to stay together.'
(Ebitundu, Historical Texts, 1920s)

Another kind of construction that is not really in use anymore, involves *nga* in the protasis. The conjunction *nga* can be used with a verb either in the present imperfective in predictive counterfactual conditionals, as was seen in (22), or in the present perfective as in (34), which is a predictive hypothetical conditional. With a verb in the present imperfective, it was found, with very low frequencies, in five decades: 1890s, 1930s, 1940s, 1970s and 2000s. In the 1890s this kind of construction occurs 0.3 times for every 10,000 words and in the 2000s it occurs 0.1 times for every 10,000 words. However, with a verb in the present perfective, *nga* was attested only in the 1890s and 1960s, with frequencies of respectively 0.5 times and 0.2 times for every 10,000 words.

(34) Fená nga twéyóngede okwágálá Isa, twándyéyóngede okwágáláná.

fena	**nga**	**tu-Ø-eyonger-ye**	o-ku-agal-a	Isa
we_all	**if**	**SP_{1PL}-PRS-continue-PFV**	AUG_{15}-NP_{15}-love-FV	Jesus
tu-andi-eyonger-ye		o-ku-agal-an-a		
SP_{1PL}-UNR-continue-PFV		AUG_{15}-NP_{15}-love-RECP-FV		

'If we all continued to love Jesus, we would continue to love each other.'
(Anoonya, Religious Texts, 1890s)

Lastly, when *obanga* is used in the protasis of a non-predictive conditional construction (cf. Table 1) with a verb in the present imperfective, as in (35), it was found only in the 1920s and 1940s, with frequencies of 0.3 times for every 10,000 words, and with a verb in the remote past perfective, as in (36), it was seen only in the 1910s with a frequency of 0.1 times for every 10,000 words. In both cases, *-andi-* in the apodosis conveys deontic necessity.

(35) Obánga tóyágála kubú'ta bwándíráyídwá, nga bwakamálá sábiti bíri […].

obanga	**te-o-Ø-yagal-a**		ku-bu-tt-a
if	**NEG-SP$_{2SG}$-PRS-want-IPFV**		NP$_{15}$-OP$_{14}$-kill-FV
bu-andi-laaw-ibw-ye		nga	bu-aka-mal-a
SP$_{14}$-UNR-castrate-PASS-PFV		when	SP$_{14}$-just-spend-IPFV
Ø-sabiti	bbiri		
NP$_{10}$-week	two		

'If you don't want to kill them, they should be castrated when they have lived for just two weeks […]'

(Amagezi2, Agricultural Documents, 1920s)

(36) Erá obánga yalí ayágálá ókúbá Omulábírízí wénsí zonâ, yándígámbye nti Nábálábírízí bé Rûmi nabó naté erá bansí zoná ngá yê.

era	**obanga**	**a-a-li**		**a-yagal-a**		o-ku-ba		
and	**if**	**SP$_1$-REM_PST-be**		**SP$_1$-want-IPFV**		AUG$_{15}$-NP$_{15}$-be		
o-mu-labirizi		wa-a		e-N-si		zi-onna		
AUG$_1$-NP$_1$-bishop		PP$_1$-CONN		AUG$_{10}$-NP$_{10}$-nation		PP$_{10}$-all		
a-andi-gamb-ye		nti	ne	a-ba-labirizi		ba-a	e	
SP$_1$-UNR-say-PFV		that	also	AUG$_2$-NP$_2$-bishop		PP$_2$-CONN	LOC$_{23}$	
Rumi	na-bo	nate	era	ba-a	N-si	zi-onna	nga	ye
Rome	and-them	too	and	PP$_2$-CONN	NP$_{10}$-nation	PP$_{10}$-all	like	him

'And if he wanted to be a bishop of all nations, he should have said that the Roman bishops are also for all nations, just like him.'

(Ebyafa mu kanisa, Religious Texts, 1910s)

5. Discussion and conclusions

In this article, we have offered a detailed description of the verbal prefix *-andi-* in Luganda, based on text corpus data. Our distributional corpus analysis has revealed additional constructions in which *-andi-* is used over and above those described in the existing literature on Luganda. In the literature *-andi-* was portrayed as mainly occurring in complex conditional constructions, in which the protasis is marked by especially the conjunction *singa* or *bwe*. Through a careful corpus analysis, however, we have seen that the structure of constructions with *-andi-* is much more complex. First of all, although the constructions mentioned in the literature are also found in the corpus, there are additional complex constructions that the corpus revealed, viz. those in which the protasis is marked by either the auxiliary *-ba* or *-li*. The corpus additionally revealed precise information relating to the tense and aspect of the protasis verb. Furthermore, while the existing literature is silent about the actual meanings beyond referring to them as 'conditionals', the corpus allows one to link specific constructions to meanings such as 'counterfactuality' or 'hypotheticality'. Secondly, we were able to learn from the corpus that *-andi-* can also significantly be used outside complex predictive conditional constructions. This basically is the case in single-clause constructions where there is no protasis at all, but also involves conditional constructions where there is a subordinate clause whose meaning is not seen as causing the meaning of the main clause, i.e. non-predictive conditionals. While in Dancygier's English-based typology the semantic distinction between predictive and non-predictive conditionals is seconded by a structural difference in terms of backshift, this is not necessarily the case in Luganda. Our systematic corpus study has revealed cases of predictive conditional constructions in which the verb forms used indicate the time they refer to in their prototypical (non-conditional) uses (Dancygier, 1993: 406).

Furthermore, although earlier grammarians of Luganda have characterized *-andi-* as a conditional marker, it more often marks modality than conditionality from a strictly synchronic point of view. Synchronically, if one opposes genuine single-clause constructions and the complex non-predictive conditionals, to complex predictive conditionals and semantic conditionals with an elided protasis, *-andi-* turns out to occur most frequently in the first two categories of clauses, where it conveys modal meanings, and not conditional meanings as in the second category of clauses.

Diachronically, we have shown that, overall, the frequency of complex predictive conditional constructions involving *-andi-* has basically decreased over time with some constructions even having completely gone out of use in present-day Luganda. Conditional meanings of *-andi-* associated with these constructions have, therefore, also greatly reduced over time. Single-clause

constructions with an elided protasis, which also express conditional meanings, have remained constant. Genuine single-clause constructions, in which *-andi-* expresses modality, have been increasing over time. This clearly suggests that complex conditional constructions in which *-andi-* expresses conditionality, have been giving way to genuine single-clause constructions in which *-andi-* expresses modality. In other words, there is an indication of a diachronic process involving the emergence of modal meanings from conditional ones. This kind of diachronic development has been reported in a wide range of languages, especially as an instance of the phenomenon of insubordination (i.e., the recruitment of main clause structures from subordinate structures) (cf. Evans, 2007: 394; Evans and Watanabe, 2016: 2). However, the case of *-andi-* does not involve insubordination since, as corpus evidence has shown, *-andi-* predominantly occurs in the apodosis of conditional constructions and in constructions that are structurally genuine single clauses. The emergence and development of *-andi-* as a modal marker is thus correlated with its growing use outside complex conditional constructions, not to say due to it,[6] taking into account the causal link there appears to exist between the structure of the clause constructions in which it is used and the meaning it conveys.

The hypothesis for this diachronic development is that the rise of single clauses from complex conditional constructions, and hence the emergence of *-andi-* as a modal marker from its primary use as an unreality conditional marker, involved three major stages[7]:

A. The original use of *-andi-* in the apodosis of canonical or predictive unreality conditionals to convey the notions of either counterfactuality (when the protasis verb has past time reference) or hypotheticality (when the protasis verb has no past time reference);
B. The extension of its usage to non-predictive conditionals, which are structurally similar to predictive conditionals in terms of the conjunctions (*singa* and *bwe*) and verbal aspect (imperfective) of the protasis, but differ semantically in that (i) there is no causal link between the contents of the protasis and the apodosis, and (ii) the apodosis conveys the modal meaning of deontic necessity and not the conditional meaning of hypotheticality;
C. The deletion of the protasis of non-predictive conditionals, which was facilitated by the absence of a causal link with the apodosis and resulted in the emergence of single clauses expressing deontic necessity.

This three-step evolution can only remain a hypothesis, which cannot be substantiated with direct empirical evidence from our diachronic Luganda corpus, because the constructions representing each of the three stages are already attested in the language from the 1890s onwards. Relying on Dancygier's model, however, the evolution of predictive conditionals first into non-predictive conditionals and then into single clauses is plausible from both a structural and semantic point of view. The semantic shift from counterfactuality and hypotheticality (conditional) to deontic necessity (modal) can easily be motived through the more generic notion of 'unreality' which underlies these different meanings. The existence of single clauses in Luganda that may convey simultaneously counterfactuality and deontic necessity further stresses this semantic relatedness. The origin of such constructions is not clear, but they possibly resulted from a structural and semantic conflation of predictive conditionals expressing counterfactuality whose protasis is elided or assumed, which are also attested since the 1890s, and single clauses expressing deontic necessity originating from non-predictive conditionals. Furthermore, it needs to be reckoned that in certain theories all modality has been taken as conditional, because possibility and necessity are always relative to something else, i.e. a sufficient condition which is left implicit because it can be inferred from the context (cf. Kratzer, 1978; van der Auwera, 1978: 177ff).[8] Even if conditionality tends to develop as a post-modal meaning in the world's languages, it is therefore not so surprising to find examples of markers that semantically evolved in the opposite direction, such as *-andi-* in Luganda. The fact that in some languages like Korean and Japanese, deontic modality is conventionally expressed by conditional sentences further highlights the strong link existing between conditionality and modality in natural language (Clancy et al., 1997: 48–49).

Even if we cannot substantiate it empirically, our diachronic corpus does indicate that the emergence of genuine single clauses expressing deontic necessity from non-predictive conditionals with an apodosis conveying the same meaning must have started well before Luganda appeared in writing. While adoptions of innovations in language are generally believed to follow an S-curve trajectory (Blythe, 2016; Blythe and Croft, 2012), which "amounts to the *qualitative* observation that the change starts slowly, accelerates and ends slowly" (Ghanbarnejad et al., 2014), the sparseness of our data points does not allow us to draw such an S-curve. However, assuming that our window of observation is on the acceleration phase, which looks like a reasonable assumption given the occurrence frequencies seen, we may approximate that phase with the straight middle section of the S-curve. An attempt to illustrate this with our diachronic corpus data is presented in Fig. 6, in which the emergence and growth of the use of *-andi-* as a modal marker is set out. A linear trendline for the data from the 1890s to the 2010s is extrapolated back into time, which suggests that modal uses would have appeared at least half a century prior to the start of our diachronic corpus, perhaps around a century earlier.

In the 1890s *-andi-* was still very marginal as a modal marker. It is only during the subsequent decades that our data show a complete reversal of this situation. Nowadays, *-andi-* has become predominantly a modal marker and is used much more rarely in conditional constructions, and definitely so in canonical predictive conditionals. This may be seen from Fig. 7, in

[6] Thanks are extended to one of the anonymous referees for stressing this point.
[7] Many thanks are due to the same anonymous referee for suggesting a three-stage hypothesis.
[8] We wish to thank Johan van der Auwera for pointing this out during the doctoral defence of the first author, which took place at Ghent University on November 23, 2017.

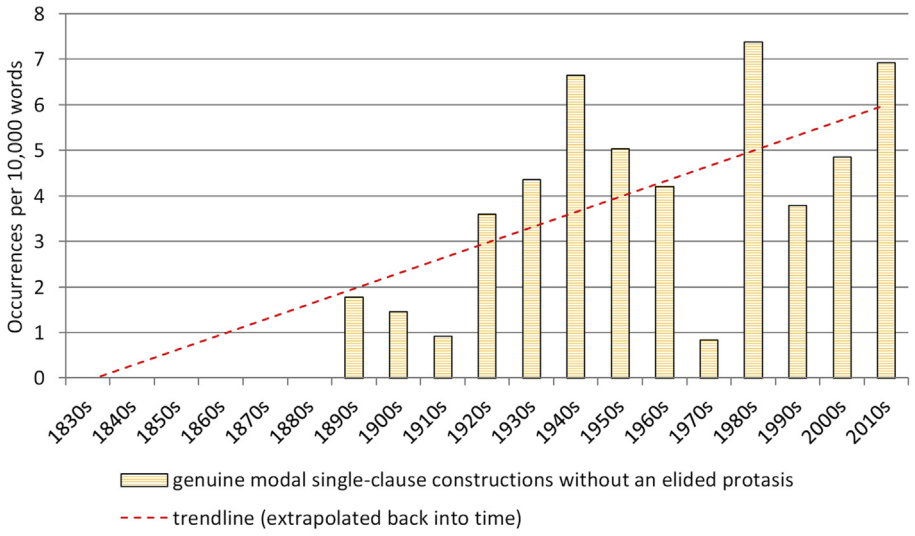

Fig. 6. Emergence and growth of the use of *-andi-* as a modal marker.

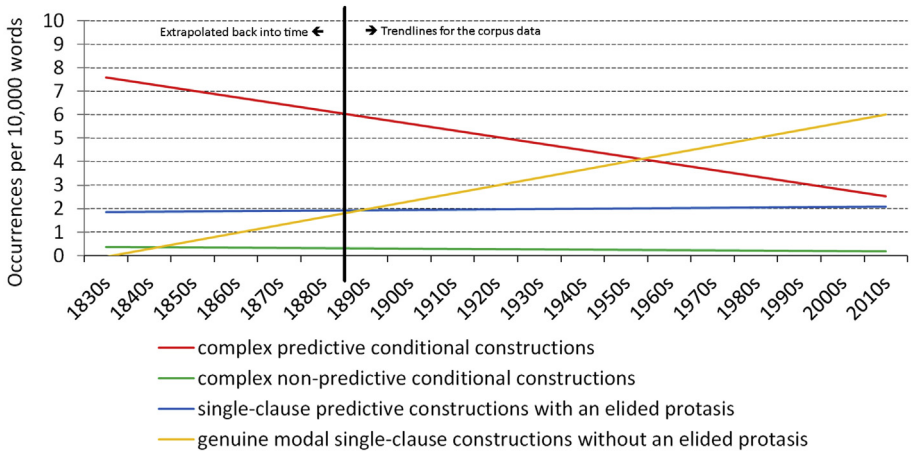

Fig. 7. Diachronic trends for the four different usage environments of *-andi-*.

which the trendlines for the four different usage environments of *-andi-* show the interplay of increasing usages of modality versus reducing usages of conditionality. In actual fact, the normalized data show that the latter two are one another's mirror image. (The focus of the S-curves is again on the straight — and by approximation 'linear' — middle sections.) Moreover, the use of complex non-predictive conditional constructions, in which *-andi-* always triggers a deontic necessity interpretation, has been rather sporadic but stable throughout the decades, and is still attested today. The use of *-andi-* in single-clause predictive constructions with an elided protasis, where it expresses counterfactuality and hypotheticality, as it does in complex predictive conditional constructions, has likewise been stable across the entire time span looked at.

The only true historical shift that could be empirically captured in our diachronic corpus is the rise of *-andi-* as a marker of epistemic possibility that happened from the 1940s onwards and was seconded by a structural change, i.e. its combination with imperfective aspect instead of perfective aspect associated with its use as marker of deontic necessity. It remains unclear, however, why instead of *-andi-* developing into an epistemic necessity marker following its use as a deontic necessity marker as should be expected (van der Auwera and Plungian, 1998: 98), it ends up expressing epistemic possibility meanings. It could be because Luganda already had a well-established epistemic necessity marker, i.e. *-téekw-* 'must', and therefore it was not necessary for another marker to perform the same function. It also appears that there are degrees of certainty or probability covered by the three markers used to express speakers' opinions in Luganda, namely *-yînz-* 'may', *-andi-* and *-téekw-*, with *-andi-* taking an intermediate position between *-yînz-* and *-téekw-*, the latter two carrying the lowest and highest degree of certainty respectively. However, a more comprehensive investigation into this remains necessary.

To conclude, the historical relationship between the structure and semantics of *-andi-* reconstructed in this article presents a departure from existing typologies of language change in the area of modality, viz. we are dealing with an uncommon

modality path where modality is developing from conditionality, and thus not a path where post-modal meanings develop out of modality as presented in, amongst others, van der Auwera and Plungian's (1998: 91ff) semantic map of modality.

Acknowledgements

The research presented in this article was supported by the Special Research Fund of Ghent University, through a doctoral scholarship awarded to the first author, with the other authors as supervisors. Sincere thanks are due to the two anonymous referees for their insightful comments. The usual disclaimers apply.

References

Abraham, W., Leiss, E., 2008. Introduction. In: Abraham, W., Leiss, E. (Eds.), Modality-aspect Interfaces: Implications and Typological Solutions. John Benjamins, Amsterdam; Philadelphia. xi-xxiv.
Ashton, E.O., Mulira, E.M.K., Ndawula, E.G.M., Tucker, A.N., 1954. A Luganda Grammar. Longmans, Green & Co., London.
Blythe, R.A., 2016. Symmetry and universality in language change. In: Degli Esposti, M., Altmann, E.G., Pachet, F. (Eds.), Creativity and Universality in Language (Lecture Notes in Morphogenesis). Springer, Cham, pp. 43–57.
Blythe, R.A., Croft, W., 2012. S-curves and the mechanisms of propagation in language change. Language 88, 269–304.
Bosa, G.L., 1997. Mafutamingi. Nnono Publishing Bureau, Kampala.
Bostoen, K., Mberamihigo, F., de Schryver, G.-M., 2012. Grammaticalization and subjectification in the semantic domain of possibility in Kirundi (Bantu, JD62). Afr. Linguist. 18, 5–40.
Bybee, J.L., Perkins, R., Pagliuca, W., 1994. The Evolution of Grammar. The University of Chicago Press, Chicago and London.
Chesswas, J.D., 1963. The Essentials of Luganda, third ed. Oxford University Press, London.
Clancy, P.M., Akatsuka, N., Strauss, S., 1997. Deontic modality and conditionality: a cross-linguistic study of adult speech to young children. In: Kamio, A. (Ed.), Directions in Functional Linguistics. John Benjamins, Amsterdam; Philadelphia.
Cole, D.T., 1967. Some Features of Ganda Linguistic Structure. Witwatersrand University Press, Johannesburg.
Comrie, B., 1986. Conditionals: a typology. In: Traugott, E.C., ter Meulen, A., Reilly, J.S., Ferguson, C.A. (Eds.), On Conditionals. Cambridge University Press, Cambridge, pp. 77–99.
Crabtree, W.A., 1902. Elements of Luganda Grammar. Society for Promoting Christian Knowledge (SPCK), London.
Dancygier, B., 1993. Interpreting conditionals: time, knowledge, and causation. J. Pragmat. 19, 403–434.
Dancygier, B., 1998. Conditionals and Prediction: Time, Knowledge and Causation in Conditional Constructions. Cambridge University Press, Cambridge.
Dancygier, B., Sweetser, E., 2005. Mental Spaces in Grammar. Cambridge University Press, Cambridge.
de Schryver, G.-M., 1999. Cilubà Phonetics, Proposals for a 'Corpus-based Phonetics from Below'-approach. Recall, Ghent.
de Schryver, G.-M., Gauton, R., 2002. The Zulu locative prefix ku- revisited: a corpus-based approach. South. Afr. Ling. Appl. Lang. Stud. 20, 201–220.
Declerck, R., Reed, S., 2001. Conditionals: a Comprehensive Empirical Analysis. Mouton de Gruyter, Berlin.
Devos, M., 2008. The expression of modality in Shangaci. Afr. Linguist. 14, 3–35.
Evans, N., 2007. Insubordination and its uses. In: Nikolaeva, I. (Ed.), Finiteness: Theoretical and Empirical Foundations. Oxford University Press, Oxford, pp. 366–431.
Evans, N., Watanabe, H., 2016. The dynamics of insubordination. In: Evans, N., Watanabe, H. (Eds.), Insubordination. John Benjamins, Amsterdam; Philadelphia, pp. 1–38.
Ghanbarnejad, F., Gerlach, M., Miotto, J.M., Altmann, E.G., 2014. Extracting information from S-curves of language change. J. R. Soc. Interface 11, 20141044.
Goodman, N., 1991. The problem of counterfactual conditionals. In: Jackson, F. (Ed.), Conditionals. Oxford University Press, Oxford, pp. 9–27.
Gorju, J., 1906. Essai de grammaire comparee : du ruganda au runyoro et au runyankole. Imprimerie des Missionnaires d'Afrique (Pères Blancs), Maison-Carrée, Alger.
Guérois, R., 2017. Conditional constructions in Cuwabo. Stud. Afr. Ling. 46, 193–212.
Haiman, J., 1978. Conditionals are topics. Language 54, 564–589.
Kamoga, F.K., Stevick, E.W., 1968. Luganda Basic Course. Foreign Service Institute, Washington, DC.
Kawalya, D., Bostoen, K., de Schryver, G.-M., 2014. Diachronic semantics of the modal verb *-sóból-* in Luganda: a corpus-driven approach. Int. J. Corpus Linguist. 19, 60–93.
Kay, P., Michaelis, L.A., 2012. Constructional meaning and compositionality. In: Maienborn, C., von Heusinger, K., Portner, P. (Eds.), Semantics. Walter de Gruyter, Berlin, pp. 2271–2296.
Kiingi, K.B., 2009. Enkuluze ya Oluganda eya e Makerere, second ed. Fountain Publishers, Kampala.
Kirwan, B.E.R., Gore, P.A., 1951. Elementary Grammar. Uganda Bookshop, Kampala.
Kratzer, A., 1978. Semantik der Rede. Scriptor, Kronberg.
Kumakiri, T., 2013. Epistemic Modality and Conditional Sentence: on the Presentative Particle of an Arabic Dialect of Tunis, vol. 33. Tokyo University Linguistic Papers (TULIP), Tunisia, pp. 155–173.
Lazard, G., 2001. L'expression de l'irréel : essai de typologie. In: Lazard, G. (Ed.), Etudes de linguistique générale : typologie grammaticale. Peeters, Leuven, pp. 413–424.
Le Veux, H., 1914. Manuel de langue luganda, third ed. Imprimerie des Pères Blancs, Maison-Carrée, Alger.
Le Veux, H., 1917. Premier essai de vocabulaire luganda-français d'après l'ordre étymologique. Imprimerie des Missionnaires d'Afrique (Pères Blancs), Maison-Carrée, Alger.
Lepota, B., 2002. Exploring the 'conditional mood' in Northern Sotho. S. Afr. J. Afr. Lang. 2, 113–121.
Livinhac, L., 1885. Essai de grammaire ruganda. Imprimerie F. Levé, Paris.
Livinhac, L., Denoit, C., 1894. Manuel de langue luganda : comprenant la grammaire et un recueil de contes et de légendes, second ed. Benziger & Co., Einsiedeln.
Livinhac, L., Denoit, C., Wolters, P.A., 1921. Grammaire luganda, fourth ed. Imprimerie des Missionnaires d'Afrique (Pères Blancs), Maison-Carrée, Alger.
Mberamihigo, F., 2014. L'expression de la modalité en kirundi : Exploitation d'un corpus électronique. Université de Gand/Université libre de Bruxelles.
Mberamihigo, F., de Schryver, G.-M., Bostoen, K., 2016. Entre verbe et adverbe : grammaticalisation et dégrammaticalisation du marqueur épistémique umeengo/umeenga en kirundi (bantou, JD62). J. Afr. Lang. Ling. 37, 247–286.
Mwamzandi, M., 2017. A corpus study of Swahili conditionals. Stud. Afr. Ling. 46, 157–173.
Nabirye, M., 2016. A Corpus-based Grammar of Lusoga. Ghent University.
Narrog, H., 2008. The aspect-modality link in the Japanese verbal complex and beyond. In: Abraham, W., Leiss, E. (Eds.), Modality-aspect Interfaces: Implications and Typological Solutions. John Benjamins, Amsterdam; Philadelphia, pp. 279–307.
Ngonyani, D., 2017. Conditionals in Ndendeule. Stud. Afr. Ling. 46, 175–192.
Nicolle, S., 2017. Conditional constructions in African languages. Stud. Afr. Ling. 46, 1–15.
Nosova, O.P., Yakovleva, I.P., 1969. Dikisonale entono Luganda – Lurassa n'Olurassa – Luganda. Izdatel'stvo "Sovetskaja Enciklopedija", Moskva.

Nuyts, J., 2006. Modality: overview and linguistic issues. In: Frawley, W., Eschenroeder, E., Mills, S., Nguyen, T. (Eds.), The Expression of Modality. Mouton de Gruyter, Berlin, pp. 1–26.
Nuyts, J., 2016. Analyses of the modal meanings. In: Nuyts, J., van der Auwera, J. (Eds.), The Oxford Handbook of Modality and Mood. Oxford University Press, Oxford, pp. 31–49.
Nuyts, J., Byloo, P., Diepeveen, J., 2010. On deontic modality, directivity, and mood: the case of Dutch mogen and moeten. J. Pragmat. 42, 16–34.
Palmer, F.R., 1986. Mood and Modality. Cambridge University Press, Cambridge.
Palmer, F.R., 2001. Mood and Modality, second ed. Cambridge University Press, Cambridge.
Parker, E., 1991. Conditionals in mundani. In: Anderson, S., Comrie, B. (Eds.), Tense and Aspect in Eight Languages of Cameroon. Summer Institute of Linguistics and University of Texas at Arlington, Texas, pp. 165–187.
Pilkington, G.L., 1901. A Handbook of Luganda. Society for Promoting Christian Knowledge (SPCK), London.
Saloné, S., 1979. Typology of conditionals and conditionals in Haya. Stud. Afr. Ling. 10, 65–79.
Saloné, S., 1983a. Conditional Sentences in Swahili. University of California, Los Angeles.
Saloné, S., 1983b. The pragmatics of reality and unreality conditional sentences in Swahili. J. Pragmat. 7, 311–324.
Scott, M., 1996–2017. WordSmith Tools. Lexical Analysis Software.
Snoxall, R.A., 1967. Luganda – English Dictionary. Oxford University Press, London.
Squartini, M., 2016. Modality and other semantic categories. In: Nuyts, J., van der Auwera, J. (Eds.), The Oxford Handbook of Modality and Mood. Oxford University Press, Oxford, pp. 50–67.
Sweetser, E., 1990. From Etymology to Pragmatics: Metaphorical and Cultural Aspects of Semantic Structure. Cambridge University Press, Cambridge.
Taljard, E., Louwrens, L.J., 2003. On the modal status of Northern Sotho conditionals. S. Afr. J. Afr. Lang. 23, 163–174.
Traugott, E.C., 1985. Conditional markers. In: Haiman, J. (Ed.), Iconicity in Syntax. John Benjamins, Amsterdam; Philadelphia, pp. 289–307.
van der Auwera, J., 1978. Language and Logic: a Speculative and Condition-theoretic Studyx. John Benjamins, Amsterdam; Philadelphia.
van der Auwera, J., Diewald, G., 2012. Methods for modalities. In: Ender, A., Leemann, A., Wälchli, B. (Eds.), Methods in Contemporary Linguistics. de Gruyter Mouton, Berlin, pp. 121–142.
van der Auwera, J., Plungian, V.A., 1998. Modality's semantic map. Linguist. Typol. 2, 79–124.
Van linden, A., Verstraete, J.C., 2008. The nature and origins of counterfactuality in simple clauses Cross-linguistic evidence. J. Pragmat. 40, 1865–1895.
Van linden, A., Verstraete, J.C., 2011. Revisiting deontic modality and related categories: a conceptual map based on the study of English modal adjectives. J. Pragmat. 43, 150–163.
Ziegeler, D., 2006. Interfaces with English aspect: diachronic and empirical studies. John Benjamins, Amsterdam; Philadelphia.

Deo Kawalya is a Lecturer at Makerere University, in the School of Languages, Literature and Communication. He obtained his PhD at Ghent University, while at the UGent Centre for Bantu Studies (BantUGent). His main interest is in corpus studies of modality for the Bantu languages in general, and for his native language Luganda in particular. His earlier work covers Bantu lexicography, both practical and theoretical.

Gilles-Maurice de Schryver is a research professor of African linguistics in the department of languages and cultures at Ghent University, and a member of BantUGent. He holds an MSc in microelectronic engineering (1995), as well as an MA (1999) and PhD (2005) in African languages and cultures. In 2002 he co-founded TshwaneDJe HLT, and in 2006 he was a founding member of African Language Technology. His main research interests are in the fields of Bantu lexicography and Bantu corpus linguistics. He is the author or co-author of about 300 books, book chapters, journal articles and conference papers within these fields.

Koen Bostoen is a research professor of African linguistics in the department of languages and cultures at Ghent University, and a member of BantUGent. His field of research is the historical, comparative and descriptive study of Bantu languages. Some of his specific domains are diachronic phonology, diachronic semantics, lexical reconstruction, verbal derivation and argument structure, and information structure. He has published widely in all these fields. Over the past fifteen years he also developed a special interest for the integration of language data into interdisciplinary approaches to the African past in general and the Bantu Expansion in particular.