The life cycle of suppletion in Crow
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1 Introduction

- Suppletion: "for the signs X and Y to be suppletive their semantic correlation should be maximally regular, while their formal correlation is maximally irregular" (Mel'čuk, 1994, 358). For example:

    (1) English *go*

PRES	PAST
go	*went*

    (2) French *aller* 'to go'

1SG	2SG	3SG	1PL	2PL	3PL
vais	*vas*	*va*	*allons*	*allez*	*vont*

- Crow is a highly polysynthetic Siouan language spoken in Montana that also exhibits suppletion:

    (3) Suppletion in Crow involving *daachí* 'stay, remain' (Graczyk, 2007, 139):

1SG	1PL
baa-lichí	*ba-káa-u*
1A-stay	1A-stay-PL

2SG	2PL
dáa-lichi	*da-káa-u*
2A-stay	2A-stay-PL

3SG	3PL
daachí	*káa-u*
stay	stay-PL

- On account of its formal irregularity, suppletion has been regarded as 'unnatural' and its occurrence in agglutinating languages have long considered to be exceptional (Fertig, 1998).

> **Proposal:**
> (i) Suppletion in the paradigm of *daachí* 'stay' arose via sound change and analogical change.
> (ii) The suppletive forms of *daachí* 'stay' were then brought into the paradigm of *datchí* 'continue (with sound)' and the suppletive forms spread to other parts of the same paradigm via analogy.
> (iii) Leveling, brought on by language shift, eliminated (some of) the suppletive forms of *-datchi* 'continue (with sound)' (and both *daachí* 'stay, remain' and *-daachi* 'CONT').

2 Emergence of suppletion in Crow

2.1 Sound change and analogy

- While Hidatsa has maintained the full set of Proto-Siouan positionals **ráąkE* 'SIT', **wúųkE* 'LIE', **háąkE* 'STAND' (Rankin et al., 2015), Crow only maintained reflexes of 'SIT' and 'LIE'.

	GROUP 1			GROUP 2			GROUP 3		
	SIT	LIE	STAND	SIT	LIE	STAND	SIT	LIE	STAND
Crow	*daachí*	*baachí*	—	*dahkú*	—	—	*datchí*	—	—
Hidatsa	*naakí*	*maakí*	?	*nahkú*	*mahkú*	*hahkú*	*naak^{h}í*	*waak^{h}í*	?

Table 1: Three groups of positional verbs

- Details on the development of the three groups of positional verbs still need to be worked out, but in both Hidatsa and Crow, the positional verbs of each group tend to share similar forms.

- Table 2 and 3 show paradigms of *waakÈ* and *raakÈ*, respectively, with similar or identical forms in the plural across the two paradigms.

| | Crow | Hidatsa | | Proto-Crow-Hidatsa |
| | *baachí* 'remain' | *maakí* 'lie' | | *waakÉ* 'lie' |
	Graczyk 2007	Boyle 2007	Park 2012	
1SG	*baa-wachí*	*ma-waakí*	*maa-wakí*	*waa-waakí*
2SG	*dáa-wachi*	*na-waakí*	*ná-waki*	*ráa-waaki*
3SG	*baachí*	*maakí*	*maakí*	*waakí*
1PL	***ba-káa-u***	***maa-ká-ʔa***	***ma-ká-á***	*waa-waaká-a*
2PL	***da-káa-u***	*na-waaká-ʔa*	***ná-ka-a***	*raa-waaká-a*
3PL	***káa-u***	***ká-a***	***ká-a***	*waaká-a*

Table 2: Paradigms of Proto-Crow-Hidatsa *waakÉ* 'lie'

| | Crow | Hidatsa | Proto-Crow-Hidatsa |
| | *daachí* 'remain, stay' | *naakí* 'sit' | *raakÉ* 'sit' |
	Graczyk 2007	Park 2012	
1SG	*baa-lichí*	*maa-rakí*	*waa-raakí*
2SG	*dáa-lichi*	*ná-raki*	*ráa-raaki*
3SG	*daachí*	*naakí*	*raakí*
1PL	***ba-káa-u***	***ma-ká-á***	*waa-raaká-a*
2PL	***da-káa-u***	***ná-ka-a***	*ráa-raaka-a*
3PL	***káa-u***	***ká-á***	*raaká-a*

Table 3: Paradigms of Proto-Crow-Hidatsa *raakÉ* 'sit'

- The diachronic development of suppletion in the paradigm of *daachí* 'remain, stay' is given below:[1]

Stage	1SG	2SG	3SG	1PL	2PL	3PL
I	*maa-raakí*	*náa-raaki*	*naakí*	*maa-raaká-a*	*náa-raaká-a*	*naaká-a*
II	***maa-rakí***	***náa-raki***	*naakí*	***maa-raka-a***	***náa-raka-a***	*naaká-a*
III	*maa-rakí*	*náa-raki*	*naakí*	***maa-ká-a***	***náa-ka-a***	naaká-a
IV	*maa-rakí*	*náa-raki*	*naakí*	*maa-ká-a*	*náa-ka-a*	***ká-a***
V	*maa-rakí*	*náa-raki*	*naakí*	***maa-káa-u***	***náa-kaa-u***	***káa-u***
VI	*maa-rakí*	*náa-raki*	*naakí*	*maa-káa-u*	***naa-káa-u***	*káa-u*
VII	***baa-lichí***	***dáa-lichi***	***daachí***	***ba(a)-káa-u***	***da(a)-káa-u***	*káa-u*

Stage I. Reconstruction of Proto-Crow-Hidatsa *naakí* 'SIT'

Stage II. Reduction of the root-initial syllable on first- and second-person forms

Stage III. Deletion of the root-initial syllable on the 1PL and 2PL forms

Stage IV. Leveling of 1PL and 2PL stem *-kaa* to 3PL

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[1]There are at least two possibilities for how *baachí* acquired the suppletive plural forms: (i) a series of sound changes and analogical changes in a similar fasion to *daachí*, or (ii) the adoption of plural forms from *daachí* (see below).

Stage V. Reanalysis of plural as part of the stem and presence of pleonastic plural *-u(u)[2]

Stage VI. Extension of accentual patterns to 2PL

Stage VII. Other sound changes: *w > b, *r > d, *k > ch / _ i, *a > i in unstressed positions, possibly reduction of long vowels[3,4]

- When the positional *daachí* grammaticalized, the suppletive forms as well as the co-varying agreement markers were retained, resulting in suppletion in both paradigms.

	Crow	
	daachí 'remain, stay'	*-daachi* 'CONT'
1SG	*baa-lichí*	*-baa-lichi*
2SG	*dáa-lichi*	*-daa-lichi*
3SG	*daachí*	*-daachi*
1PL	*ba-kaá-u*	*-ba-kaa-u*
2PL	*da-kaá-u*	*-da-kaa-u*
3PL	*kaá-u*	*-kaa-u*

Table 4: Paradigms of *daachí* and *-daachi* 'continuative'

2.2 Incursion of forms

- Incursion occurs when forms from one lexeme replaces forms of another semantically-related lexeme (Fertig, 1998; Juge, 1999; Maiden, 2004; Börjars and Vincent, 2011; Juge, 2013, 2019). For example:

  ◇ English *went* was originally the past tense of *wend* 'to turn'.
  ◇ Suppletion in French *aller* involves Latin *ire* 'go', *uadere* 'rush', and *ambulare* 'walk'.

- I suggest that the suppletive forms in the paradigm of *-datchi* (< *datchí*) 'continue (with sound)' is a result of incursion of forms of *daachí* 'stay' followed by intra-paradigmatic analogy (i.e. leveling).

	Crow	
	-datchi 'continue (with sound)' Graczyk 2007:139	*daachí* 'stay, remain' Graczyk 2007
1SG	***-baa-kaa***	*baa-lichí*
2SG	***-daa-kaa***	*daa-lichí*
3SG	*-datchi*	*daachí*
1PL	***-baa-kaa-u***	***ba-káa-u*** (< ***baa-káa-u***)
2PL	***-daa-kaa-u***	***da-káa-u*** (< ***daa-káa-u***)
3PL	*-att-uu* ~ *-batt-uu*	*káa-u*

Table 5: Incursion of forms from *daachí* to *datchí*

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[2]In Crow, the ablauting pattern *i/a* has become somewhat marginal occurring on a scattering of highly frequent verbs (e.g. *dútchi* 'take'). In Hidatsa, this pattern can still be seen on numerous verbs.

[3]Evidence for *a > i* in unstressed positions is as follows: H *-raci*, Cr *-lichi* 'approximative', H *maxúa* Cr *bixúa* 'spilled', H *matooki*, Cr *bishóochi* 'shell', H *mašúka*, Cr *bishká* 'dog', H *kakíxi*, Cr *chichiáxi* 'cylindrical', H *ahí*, Cr *ihí* 'turnip', H *íiwaši*, Cr *íiwishi* 'price', and H *maší*, Cr *bishí* 'robe, blanket'. However, there are a few exceptions: H *cawée*, Cr *tawée* 'hot', H *maháa*, Cr *baháa* 'spring', and H *kakúwi*, Cr *kukúwi* 'squash'.

[4]Reduction of long vowel is attested in few cognates but it does not appear to be common: H *áaciiwiri*, Cr *áachiwiili* 'milk', H *áchaa*, Cr *áhta* 'close', and H *náawi*, Cr *dáawii* 'three'. Most cognates share long vowel and so those with mismatch in vowel length is more of an exception. Nevertheless, phonological reduction is cross-linguistically common even if it is not regular here.

- Graczyk (2007, 306): "*Datchi* can only cooccur with verbs that denote activities performed with the mouth: speaking, crying, shouting, etc., as well as noises of animals."

  (4) a. *Logan ilaa-latchi-k*
           Logan talk-CONT-DECL
           'Logan kept on talking'

       b. *Logan iwaa-Ø-latchi-k*
           Logan cry-JUNCT-CONT-DECL
           'Logan kept on crying'

- However, the morpheme *-datchi* is more accurately described as a continuative that involves sound since not all verbs involving the mouth can be used with *-datchi*, such as 'eat' and 'drink':

(5) a. **Logan baa-lúsh-datchi-k*
          Logan   INDEF.OBJ-eat-CONT-DECL
          Intended: Logan kept on eating (something)

     b. **Logan baa-ishíi-latchi-k*
          Logan   INDEF.OBJ-drink-CONT-DECL
          Intended: Logan kept on drinking (something)

- In Hidatsa, Park (2012, 270) reports four so-called 'evidential posture verbs' and these verbs are used when the "speaker's only source of information about a situation is auditory." Three of these verbs are shown below and I suggest that Hidatsa *naak^{h}í* is a cognate of Crow *-datchi*.

(6) Hidatsa

     a. *Maagarísda íîwia maak^{h}í-c*
         child   cry   lie.CONT-DECL
         'The child is crying (in a lying position)'   (Park, 2012, 271, Ex187a, adapted)

     b. *Maagarísda íîwia naak^{h}í-c*
         child   cry   sit.CONT-DECL
         'The child is crying (in a sitting position)'   (Park, 2012, 271, Ex187b, adapted)

     c. *Maagarísda íîwia naháà-c*
         child   cry   stand.CONT-DECL
         'The child is crying (in a standing position)'   (Park, 2012, 271, Ex187c, adapted)

- These positionals appear to be defective in Hidatsa and I have attempted to internally reconstruct the missing Hidatsa forms, as shown in the following table:

	Crow	Hidatsa	
	-datchi	*waak^{h}i*	*naak^{h}i*
	Graczyk 2007:139	Boyle 2007:178	Park 2012
1SG	**-baa-kaa**	*ma-waak^{h}í*	**ma-raak^{h}í*
2SG	**-daa-kaa**	*na-waak^{h}í*	**na-raak^{h}í*
3SG	*-datchi*	*waak^{h}í*	*naak^{h}í*
1PL	**-baa-kaa-u**	*ma-k^{h}í-ʔa*	**ma-k^{h}í-ʔa*
2PL	**-daa-kaa-u**	*na-k^{h}í-ʔa*	**na-k^{h}í-ʔa*
3PL	*-att-uu ~ -batt-uu*	**waak^{h}i-ʔa*	*áak^{h}a-ʔ(a)*

Table 6: Paradigms of select positionals in Crow and Hidatsa

- Although the sound changes are not well-understood, there is some evidence that Hidatsa k^h corresponds with Crow *tch* [t͡ʃː] when followed by a front vowel (i.e. palatalization).[5,6]

- Suppletion in the first- and second-person of Crow *-datchi* cannot be due to sound changes:

  1. No ablaut: Evidence from Hidatsa shows that this erstwhile positional does not display ablaut as does evidence from Crow when *-datchi* inflects for 3PL as *-att-uu* ∼ *-batt-uu*.

  2. No consistency: If 1PL and 2PL displays ablaut, the form of the stem would be unexpected since geminate *tch* occurs preceding front vowels whereas *tt* occurs elsewhere.[7]

  3. No correspondence: To my knowledge, there are no attested cognates showing correspondence between Crow *k* and Hidatsa k^h (cf. footnote 6).

- The more likely explanation is that the first- and second-person suppletive forms of *-datchi*, which arose from the independently occuring verb **datchí*, were brought in from the paradigm of **daachí*.[8]

- Below is the diachronic development of suppletion in the paradigm of *-datchi* 'continue (with sound)':

Stage	1SG	2SG	3SG	1PL	2PL	3PL
I	**baa-latchí*	**dáa-latchi*	**datchí*	**baa-latt-úu*	**dáa-latt-uu*	**datt-úu*
II	**baa-latchí*	**dáa-latchi*	**datchí*	****baa-káa-u***	****daa-káa-u***	**datt-úu*
III	****baa-káa***	****daa-káa***	**datchí*	**baa-káa-u*	**daa-káa-u*	**datt-úu*
IV	**baa-káa*	**daa-káa*	**datchí*	**baa-káa-u*	**daa-káa-u*	****att-úu* ∼ **batt-úu***
V	*-baa-kaa*	*-daa-kaa*	*-datchi*	*-baa-kaa-u*	*-daa-kaa-u*	*-att-uu* ∼ *-batt-uu*

Stage I. Internal reconstruction of Pre-Crow **datchi* 'SIT'

Stage II. Incursion of 1PL and 2PL forms from **daachi* 'SIT' to **datchi* 'SIT'

Stage III. Extension of 3SG/3PL pattern to 1SG/1PL and 2SG/2PL[9]

   E.g. **-datt-uu* : **-datchi* :: **-baa-kaa-u* : X, X = **-baa-kaa*; 3rd person as the base
   Cf. **maa-rakí* : **maa-ká-a* :: **naakí* : X, X = **ká-a*; speech-act participants (SAPs) as the base

Stage IV. Incursion of erstwhile 3PL forms **att-úu* and **batt-úu* from **atchí* (< **hatchí* 'STAND') and **batchí* 'LIE', respectively

Stage V. Grammaticalization of **datchí* 'SIT' > *-datchi* 'continue (with mouth)'

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[5]Note that *tch* is ambiguous between representing a geminate affricate *ch* and the stop-affricate cluster *t* + *ch*; it is unclear whether such clusters should also be considered as geminates (cf. footnote 7).

[6]Examples illustrating this correspondence are as follow: H *ákhiri*, Cr *áatchila* 'lucky', H *itacákhee*, Cr *isítchee* 'like', H *makhee*, Cr *batchée* 'I give (away)', and H *nakhipi*, Cr *datchípi* 'carve, shave'. In other environments, Hidatsa *kh* appears to sometimes correspond with *kk* and other times with *hk* in Crow: H *arákhu*, Cr *alákku* 'cured, smoked', H *awakhíru*, Cr *awakkulí* 'dwarf', H *mikháa*, Cr *bikkáa* 'hay', H *nakhaati*, Cr *dakkashí*, H *iirakhúci*, Cr *dakkúchi*, *dahkúchi* 'swing'; H *íikhaati*, Cr *íihkaashi* 'tent stake', and H *xareeitaakhá*, Cr *xalaaassahká* 'mushroom'.

[7]This analysis differs from Graczyk (2007, 27) who suggests that *tt* occurs before *a*-initial suffixes and *uu*, and *tch* is found elsewhere. However, it is a typologically unusual to posit *tch* → *tt* / _-a,-uu as opposed to *tt* → *tch* / _i,e. Sequences of *tchu* do exist, such as *datchúushi* 'whip', but these appear as *t* + *ch* clusters where *dat-* is part of the *daC* instrumental prefix 'by force'.

[8]*Datchí* appear to occur independently as the main predicate as in the following example featuring a clause chain:

(i)   *áxp-ilaa-k*   **datchí-i-k**
    with-speak-ss continue-HAB-DECL
    'he would keep talking to them'   (Graczyk, 2007, 306)

[9]While the analogical changes explain the historical development of *-daachi* and *-datchi*, their bases differ. I surmise that differences in frequency between the two morphemes has a role to play.

3   Language contact and analogy

- Language shift often promotes grammatical restructuring and the emergence of extensive variation within an unusually short time period. Such variation may be looked down upon by both community members and outsiders and described as 'slang', 'improper', or 'inauthentic'.

  > "[I]n fieldwork and documentation activities many linguists adopt practices which covertly promote prescriptivist values and undermine their purported neutral stance towards language change and variation. In language descriptions linguists by and large continue to understate or simply ignore [...] variation and emergent varieties." (Florey, 2004, 12)

- Not only do I suggest that we should document variation among younger speakers as a way to validate and de-stigmatize their varities (Abtahian and Quinn, 2017), but I suggest that analogical changes that occur in these situations can provide important insights into analogical change; language shift may affect spheres of language use, but there does not seem to be reason to suspect that the mechanisms underlying analogical change should also differ.

- The following paradigm of *-datchi* is produced by Felice Big Day, a speaker of Crow:

	Crow		
	-datchi 'continue (with sound)'		
	Graczyk 2007	Felice Big Day	
1SG	*-baa-kaa*	*-baa-kaa*	∼ ***-b-atchi***
2SG	*-daa-kaa*	*-daa-kaa*	∼ ***-d-atchi***
3SG	*-datchi*	*-datchi*	∼ ***(-kaa)***
1PL	*-baa-kaa-u*	*-baa-kaa-u*	∼ ***-b-att-uu***
2PL	*-daa-kaa-u*	*-daa-kaa-u*	∼ ***-d-att-uu***
3PL	*-att-uu* ∼ *-batt-uu*	***-datt-uu***	∼ *-kaa-u*

Table 7: Paradigms of *-datchi*

- Here, I focus on the novel third-person variant *-kaa* '3SG continue (with sound)'.[10] According to Felice, the form *-kaa* appears to be restricted to certain collocations and constructions, whereas the older variant *-datchi* may be used in a wider range of contexts:

(7)   *ilíia* 'talk' only allows *-datchi*

    a.   Logan ilá-**latchi**-k
        Logan talk-JUNC-3.CONT-DECL
        'Logan kept on talking'

    b.   *Logan ilá-a-**kaa**-k
        Logan   talk-JUNC-3.CONT-DECL
        'Logan kept on talking'

(8)   *íiwe* 'cry' allows *-datchi* and *-kaa*

    a.   Logan íiwa-a-**latchi**-k
        Logan cry-JUNC-3.CONT-DECL
        'Logan kept on crying'

    b.   Logan íiwa-a-**kaa**-k
        Logan cry-JUNC-3.CONT-DECL
        'Logan kept on crying'

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[10]There is some evidence suggesting that such changes are somewhat within expectation and not entirely irregular or unpredictable. For example, the paradigm produced by Felice Big Day features two bases (cf. Albright, 2008): third person and SAPs as the base. Patterns that involve more than one base have been reported for English: *glide/glode → glide/glided* but *dive/dived → dive/dove*. Still, it is a single paradigm that exhibits two potential bases, so more research is needed to examine whether multiplicity of bases across paradigms is comparable to those within a single paradigm. Additionally, while not a dominant pattern, the agreement on *-datchi* (i.e. 1SG: *-batchi*, 2SG: *-datchi*, 3SG: *-datchi*, etc.) occurs on at least fifty verbs with the 'instrumental' *daC* 'by force', e.g. *baxchí/dáaxchi/daxchí* '1SG/2SG/3SG tie', *batchuushí/dáatchuushi/datchuushí* '1SG/2SG/3SG whip'.

- This data is a counterexample to Kuryłowicz's (1945, 30, my translation) fairly robust fourth law of analogy: "When a form undergoes differentiation following analogical change, the new form adopts the primary ('basic') function, while the old form takes on a secondary function ('derived')."

- It remains to be seen how generalizable these findings are, but even on-line productions of analogy occurring at the individual level can provide valuable insights into issues such as directionality.

4   Concluding remarks

- When viewed synchronically, suppletion appears extraordinary and "does not make sense" (Maiden, 2004, 229); but when observed from a diachronic perspective, the emergence and subsequent loss of suppletion are really just a result of a series of ordinary changes.

  ◇ This study builds on previous work on Crow that examines how 'unnatural' morphology such as multiple exponence may spread across different paradigms within a single language (Ko 2020, Ko, to appear).

- Language documentation is wrapped up in ideologies of purity and authenticity — speakers of the older variety often gain authority and legitimacy by the way they speak.

- It is important to document and describe variation rather than privileging one particular variety; younger speakers will one day be at the forefront of language documentation and revitalization efforts.

Acknowledgements

Abbreviations

The abbreviations used in this paper are as follows: 1 = first person, 2 = second person, 3 = third person, A = A-set (active) marking, B = B-set (stative) marking, CONT = continuative, Cr = Crow, DECL = declarative, H = Hidatsa, HAB = habitual, INDEF = indefinite, JUNCT = juncture, OBJ = object, PL = plural, SG = singular, and SS = same subject.

References

Abtahian, M. R. and Quinn, C. M. (2017). Language shift and linguistic insecurity. In Kristine A. Hilde-brandt, C. J. and Silva, W., editors, *Documenting Variation in Endangered Languages*, pages 137–151. University of Hawai'i Press.

Albright, A. (2008). Explaining universal tendencies and language particulars in analogical change. In Good, J., editor, *Linguistic universals and language change*, pages 144–181. Oxford University Press Oxford.

Börjars, K. and Vincent, N. (2011). The pre-conditions for suppletion. In George Tsoulas, Glyn Hicks, A. G., editor, *Morphology and Its Interfaces*, pages 239–265. John Benjamins Publishing Company.

Boyle, J. P. (2007). *Hidatsa morpho-syntax and clause structure*. PhD thesis, The University of Chicago.

Fertig, D. (1998). Suppletion, natural morphology, and diagrammaticity. *Linguistics*, 36(6).

Florey, M. (2004). Countering purism: confronting the emergence of new varieties in a training program for community language workers. *Language documentation and description*, pages 9–27.

Graczyk, R. (2007). *A grammar of Crow*. University of Nebraska Press, Lincoln, Nebraska.

Juge, M. L. (1999). On the rise of suppletion in verbal paradigms. In Good, J. and Yu, A., editors, *Annual Meeting of the Berkeley Linguistics Society*, volume 25, pages 183–194.

Juge, M. L. (2013). Analogy as a source of suppletion. In Kikusawa, Ritsuko, R. L. A., editor, *Historical Linguistics. Selected papers from the 20th International Conference on Historical Linguistics, Osaka, 25-30 July 2011*.

Juge, M. L. (2019). The sense that suppletion makes: Towards a semantic typology on diachronic principles. *Transactions of the Philological Society*, 117(3):390–414.

Ko, E. (2020). On the origins of multiple exponence in Crow. Paper presentation at 40th Annual Siouan and Caddoan Languages Conference, Berkeley, CA, May 21, 2020.

Ko, E. (to appear). On the origins of multiple exponence in Crow. *Diachronica*.

Kuryłowicz, J. (1945). La nature des procès dits «analogiques». *Acta linguistica*, 5(1):15–37.

Maiden, M. (2004). When lexemes become allomorphs – on the genesis of suppletion. *Folia Linguistica*, 38(3-4).

Mel'čuk, I. A. (1994). Suppletion: toward a logical analysis of the concept. *Studies in Language. International Journal sponsored by the Foundation "Foundations of Language"*, 18(2):339–410.

Park, I. (2012). *A grammar of Hidatsa*. PhD thesis, Indiana University Bloomington.

Rankin, R. L., Carter, R. T., Jones, A. W., Koontz, J. E., Rood, D. S., and Hartmann, I., editors (2015). *Comparative Siouan Dictionary*. Max Planck Institute for Evolutionary Anthropology, Leipzig.