A Learners' Perspective on the Rise of the English Dative Alternation

Jordan Kodner
University of Pennsylvania

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Stellenbosch University

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- **But not when the goal is to understand *why* change happens**

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- **E.g., the dative alternation**

The English Dative Alternation

- **Broad traditional name for a pair of surface constructions**

Double Object:	***Alice gave Bob the book***	***Alice told Bob a story***
to-Dative:	***Alice gave the book to Bob***	***Alice told a story to Bob***

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- **Not always the case that both constructions are grammatical**

ok	***Alice asked Bob a question***	*****	***Alice said Bob something***
*****	***Alice asked a question to Bob***	**ok**	***Alice said something to Bob***

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Structures may be parallel but are independent

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  - **Single-derivation accounts (Larson 1989, etc.)**

    One structure is derived from the other via movement

Where the Dative Alternation Came From

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- **Brief overview of the dative alternation's history**
- **Excursion on the acquisition of the modern alternation**

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An Account

1. **Actuation of the to-dative** **What triggered it?**

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1. Actuation of the to-dative
2. Expansion of the to-dative **Why did it spread through the lexicon?**

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1. Actuation of the to-dative
2. Expansion of the to-dative
3. Retreat of the to-dative

How did it reach its modern distribution?

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1. Actuation of the to-dative
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3. Retreat of the to-dative
4. The loss of symmetric double objects Why did they disappear?

History of the English Dative Alternation

Old English

- **No true to-dative**

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Sometimes used *to* to introduce abstract goals

> ***…and hu miht þus secgan to ðinum breðer þus:***
> ***“…And he might say to his brother…”*** **(coaelhom,+AHom_14:146.2080)**

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> ***…þæt he forgeafe godne willan þam seocan hæðenan***
> ***“…that he would grant the sick heathen good will”*** **(ÆCHom ii.2.12.28)**

> ***…gif þu geoffrast Gode ænige lac æt his weofode.***
> ***“…if you offer God any sacrifice at his altar.”*** **(ÆCHom 16.19)**

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- **More similar to Icelandic than to Modern English**

Middle English

- **to-Dative rose dramatically in frequency**
- **DO-IO double object fell out of use**
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PPCME2 Counts for *Give*, *Grant*, *Show*, *Teach*, *Tell*

Era	# DO-IO	# Db Obj	% DO-IO	# to-Dat	% to-Dat
m1 (1150-1250)	23	63	36.51	11	14.87
m2 (1250-1350)	1	10	10.00	62	86.11
m3 (1350-1420)	0	53	0	183	77.54
m4 (1420-1500)	0	31	0	48	60.76

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- An entailment: Leveling ⇔ to-dative instead of DO-IO
- Does not stand up to evidence

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  ***He saued to hym** þe helpe of hys chosen and hys holi pouste.*
  "He saved him the help of his chosen and his holy power" (CMEARLPS,119.5212)

  ...God forbed this werre to Roboam and al his peple
  "...God forbade Rehoboam and all his people from this battle" (CMPURVEY,I,13.510)

  ...and pyteuously forgyve offences and dettes to theym
  "...and pietously forgive them their offenses and debts" (CMINNOCE,8.117)

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  Huet may þe zone betere acsy to his uader…?
  “What may the son better ask his father…?” (CMAYENBI,110.2131)

  …and he wold aske mercy wyth a meke hert to God
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Acquisition of the Dative Alternation

Why Learning is Necessary

Arbitrariness

Why does *give* support the double object while *donate* does not?
Why does *throw* support the double object in English but not Norwegian?

Inter-speaker variation

Why do many, but not all, speakers reject the double object with *donate*?

Burden on UG

Verbs need to be pre-defined to overcome arbitrariness
Change is impossible

Why Innateness is Necessary

Interactions

E.g., with A’-raising, idioms

Underspecification

Verbs are not be attested with all possible constructions in learner input

Innovation

Mimicking cannot produce new uses
Change becomes impossible

Semantic Classification

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- If “enough” members of a semantic class are attested with a construction, it is extended to all members
- Proposed classification schemes are descriptive
- But they share common features
- Classification alone does not solve the problem
- A suitable learning algorithm is required as well

Broad vs. Narrow-Range Classes

Broad-Range

- **Caused Possession vs. Caused Motion**
- **Correspond to Recipient and Goal thematic roles**
- **Insufficient to explain fine details (e.g., *give* vs. *donate*)**
- **Innate?**

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Narrow-Range

- **E.g., GIVE-type, THROW-type, CARRY-type, LATINATE-type, etc.**
- **Similar but not identical across languages**
- **Learned distributionally from input?**

Levin (1993) Narrow-Range Classes

Double Object & to-Dative:

- GIVE - feed, give, lend, etc.
- TRANSFER OF MESSAGE - teach, show, etc.
- FUTURE HAVING - grant, promise, etc.
- CARRY - carry, pull, etc.
- BRING/TAKE - bring, take.
- THROWING - cast, hit, throw, etc.
- SEND - send, ship, etc.
- DRIVE - chase, drive, steer, etc.

An effective approximation. Similar to other descriptions (e.g., Gropen 1989).

Psycholinguistic evidence that children use similar classes cross-linguistically

to-Dative Only:

- SAY - say, speak, etc.
- MANNER OF SPEAKING - call, cry, sing, etc.
- FULFILLING - entrust, pledge, etc.
- PUTTING IN SPECIFIED DIR - lift, raise, etc.
- LATINATE - distribute, explain, donate, etc.

Double Object Only:

- DO ONLY - ask, beget, wish, etc.
- DUB - anoint, dub, etc.
- APPOINT - allow, appoint, ordain, etc.
- BILL - bill, charge, tender, etc.
- DECLARE - declare, judge, etc.

Quantifying “Enough”

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- **Yang (2016)’s Sufficiency Principle fits the bill**
- **Related to the Tolerance Principle**
- **Successfully applied to synchronic acquisition of the double object**

The Sufficiency Principle

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Sufficiency Principle

***N*: # of attested members**

***M*: # of members attested with construction**

Construction is productive if:

$$N\text{-}M < N / \ln N$$

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- **Inter-speaker variation as a function of when vocabulary is learned (donate)**
- **Over-production when constructions are temporarily productive**
- **Children can backtrack**

CHILDES over-productions

to-Dative: *"I asked this to you."*

Double Obj: *"Jay said me no."*

The Rise of the to-Dative

Actuation

- **Misinterpretation of *to* + animate goal construction as *to* + recipient**

Alice sent the book to Bob	**AMBIGUOUS**
Alice sent the book to the White House	**AMBIGUOUS (metonymy)**
Alice kicked the book to Bob	**AMBIGUOUS**
Alice kicked the book to the tree	**UNAMBIGUOUS**

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- **Learners who make this mistake have no way to be corrected**
- **Formally, the intended (goal) and misunderstood (recipient) meanings differ**
- **Practically, the intended and misunderstood meanings are identical**

Ambiguous Goals in Middle English

Concrete Goals

…tyll þay broght to him þat broþer þat was at home
“…till they brought to him that brother that was at home” (CMMIRK,99.2671)

Asa sente mychil gold and syluer to the king of Syrie
“Asa sent much gold and silver to the king of Syria” (CMPURVEY,I.22.1050)

Ambiguous Goals in Middle English

Abstract Goals

…and blesse hym that seith to thee harm.
"…and bless him that says to you harm." **(CMCTMEL.I,226.C2.371)**

…so þat þu mowe seye to þy singuler loue,…
"…so that you may say to him your singular love,…" **(CMAEL.R3,60.1041)**

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	Swedish	Faroese
DoubO	*Jag har gett mannen boken* “I gave the.man the.book”	*Hon gaf Mariu troyggiuna* “She gave Maria the.sweater”
to-Dat	*Jag har gett boken till mannen* “I gave the.book to the.man”	*Hon gaf troyggiuna till Mariu* “She gave the.sweater to Maria”

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	Spanish	French
to-Dat	*Juan (le) dio el libro a Maria*	*Je (lui) donne le livre à Marie*
	“Juan gave the book to Maria”	“I gave the book to Marie”

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- **Nepali obligatorily follows recipients with *lai* and goals with *tira*/Ø**
- **There is no relevant ambiguity… and no to-dative**

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Alice le Bob lai/*tira chitti pathai
Alice INS Bob DAT letter sent
“Alice sent Bob the letter/letter to Bob”

Alice le Bob *lai/tira chitti pathai
Alice INS Bob TO letter sent
“Alice threw Bob the book/book to Bob”

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- Nepali obligatorily follows recipients with *lai* and goals with *tira*/Ø

Alice le chitti Kathmandu ma kasailai pathai
Alice INS letter Kathmandu at someone.DAT sent
"Alice sent the letter to (someone in) Kathmandu"

Alice le chitti Kathmandu ko kasai thau (ma)/(tira) pathai
Alice INS letter Kathmandu GEN somewhere at/TO sent
"Alice sent the letter to (somewhere in) Kathmandu"

Expansion of the to-Dative

- **Misinterpreted ambiguous *to* constructions serve as evidence to children**
- **With enough evidence, the new to-dative could spread to additional verbs**
- **WIthout enough evidence, it cannot spread past the ambiguous *to* cases**

Expansion of the to-Dative

- **Testable for historical English!**

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- **36 support the ambiguous construction**

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- **Extracted 75 verbs with recipient semantics from PPCME2**
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Could children extend the to-dative to 75 verbs with evidence from 36 verbs?

Using the Sufficiency Principle

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But what about semantic classes?

The Sufficiency Principle and Narrow Classes

Perform the calculation for each class

Class	*N*	*M*	*N* / ln *N*	*N* - *M*	Gen?
T. MESSAGE	10	2	4.34	8	NO
GIVE	5	4	3.11	1	YES
FUT. HAV.	14	10	5.30	4	YES
CARRY	0	-	-	-	-
BRING/TAKE	4	4	2.89	0	YES
THROW	1	1	(1)	0	YES
SEND	1	1	(1)	0	YES

Class	*N*	*M*	*N* / ln *N*	*N* - *M*	Gen?
DRIVE	1	1	(1)	0	YES
SAY	2	2	(2)	0	YES
MANNER S.	2	0	(2)	2	-
FULFILLING	3	2	2.73	1	YES
PUT S. DIR	7	4	3.60	3	YES
LATINATE	9	5	4.10	4	YES
DO ONLY	6	0	3.35	6	NO
DUB	4	0	2.89	4	NO
APPOINT	3	0	2.73	3	NO
BILL	0	-	-	-	-
DECLARE	3	0	2.73	3	NO

Extension to Broad Classes

- **One age cohort could generalize the to-dative to most narrow range classes**
- **A next cohort received both ambiguous *to* and the new to-datives as evidence**

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Broad Classes

Class 1 (caused possession, some motion)	T. MESSAGE, GIVE, FUTURE HAVING
Class 2 (caused motion and possession)	CARRY, BRING/TAKE, THROW, SEND
Class 3 (caused motion)	DRIVE, SAY, M. SPEAK, FULFILL, PUT
Class 4 (morphophonological)	LATINATE
Class 5 (no caused motion)	DO ONLY, DUB, APPOINT, BILL, DECL.

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Class	*N*	*M*	*N* / ln *N*	*N* - *M*	Gen?
Class 1	29	21	8.61	8	YES
Class 2	6	6	3.35	0	YES
Class 3	15	13	5.54	2	YES
Class 4	9	9	4.10	0	YES
Class 5	16	0	5.77	16	NO

Extension to “All”

- **A second cohort could extend the to-dative to Classes 1-4, but not 5**
- **This is identical to the modern distribution**

Extension to “All”

- A second cohort could extend the to-dative to Classes 1-4, but not 5
- This is identical to the modern distribution
- With this additional evidence, the next cohort extends it to all recipient verbs
- Matches Middle English corpus data (e.g., ask to, forbid to, etc.)
- *M* = 59 (all of Classes 1-4)

Class	N	M	N / ln N	N - M	Gen?
All Recip	59	76	17.37	17	YES!

Interim Summary

- **The to-dative is the result of misinterpreting ambiguous *to*-goal constructions**
- **The to-dative tends to arise in languages with enough of such constructions**

Interim Summary

- **The to-dative is the result of misinterpreting ambiguous *to*-goal constructions**
- **The to-dative tends to arise in languages with enough of such constructions**
- **Applying the Sufficiency Principle as the learning algorithm, the rapid spread of the to-dative is accounted for**
- **As well as the tenuous “overgeneralization” of the to-dative**

The (Partial) Decline of the to-Dative

The Goal

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- **A full account of the to-dative must explain its retreat as well as its rise**
- **The Sufficiency Principle applied to changing vocabulary solves it**

Changing Inputs

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PPCEME

- **118 lemmas (59 overlap with PPCME2)**
- **44 ambiguous to lemmas (26 overlap)**
- **Conservatively assume all overlap all and ambiguous *to* lemmas support to-dative**

Learning the Early Modern English to-Dative

- **We perform the same process of narrow to broad generalization as before**
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Class	*N*	*M*	*N* / ln *N*	*N* - *M*	Gen?
Class 1	27	27	8.19	0	YES
Class 2	8	8	3.85	0	YES
Class 3	29	21	8.61	8	YES
Class 4	29	14	8.61	15	NO
Class 5	25	9	7.77	14	NO

Learning the Early Modern English to-Dative

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- Given the new vocabulary, extension to Classes 4 and 5 fails
- And extension to all recipient verbs fails

Class	N	M	N / ln N	N - M	Gen?
All Recip	118	87	24.73	31	NO

Classes 4 and 5

- **Successfully removes the to-dative from Class 5 (as in Modern English)**
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Latinate Verbs

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Possible Solution

- **Latinate verbs were sometimes borrowed with Romance syntax (cf Ayenbite)**
- **Recent work by Engemann & Trips**
- **This would boost their *M* value and render to to-dative productive**

Interim Summary

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Interim Summary

- **The same learning process that explains the rise of the to-dative explains its partial retreat**
- **It is unclear what to do with Latinate verbs**

DO-IO Double Objects

The to-Dative vs. DO-IO Double Objects

- **Have not addressed it yet because we propose no direct relationship between the to-dative and DO-IO double objects**

The to-Dative vs. DO-IO Double Objects

- **Have not addressed it yet because we propose no direct relationship between the to-dative and DO-IO double objects**
- **Contrasts with previous accounts arguing that the to-Dative replaced DO-IO**
- **An “accidental” ambiguity account for the loss of DO-IO better explains cross-linguistic data on the phenomenon**

Surface Ambiguity

- **Corpus research on DO-IO is frustrated by surface ambiguity**
- **How to distinguish “genuine”/base generated DO-IO from scrambled IO-DO?**

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Potentially Scrambled IO-DO

- **Heavy NP shift moves IO rightward over DO**
- **Pronoun cliticization moves DO leftward over IO**

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- Heavy NP shift moves IO rightward over DO
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Unambiguous DO-IO (McFadden 2002, Polo 2002)

- Full NP DO and Pronoun IO
- Cannot be the result of either movement

Surface Ambiguity

- **Corpus research on DO-IO is frustrated by surface ambiguity**
- **How to distinguish “genuine”/base generated DO-IO from scrambled IO-DO?**
- **Surface ambiguity is hard on researchers. Is it hard on children too?**

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Proposal

As unambiguous DO-IO became rarer, children had no need to posit a unique structure. All remaining DO-IO were interpreted as scrambling.

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- **How to distinguish “genuine”/base generated DO-IO from scrambled IO-DO?**
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Proposal

As unambiguous DO-IO became rarer, children had no need to posit a unique structure. All remaining DO-IO were interpreted as scrambling.

- **Lends itself to a competing grammars account**
- **Base generated DO-IO is at a disadvantage due to ambiguity**

Corpus Evidence

- **PPCME2 and PPCEME token frequencies**

Era	V-NP-pro	% Total	Total DO-IO	% Total	Total Double Object
m1 (1150-1250)	31	4.40	339	48.15	704
m2 (1250-1350)	5	1.75	97	33.92	286
m3 (1350-1420)	1	0.13	211	27.58	765
m4 (1420-1500)	1	0.15	99	15.23	650
e1 (1500-1569)	1	0.10	244	23.33	1046
e2 (1570-1639)	1	0.07	265	19.77	1412
e3 (1640-1720)	0	0.00	185	15.58	1155

Corpus Evidence

- **Unambiguous V-NP-pro DO-IO dropped off almost completely**

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Corpus Evidence

- **Ambiguous DO-IO dropped off then levelled off**

Era	V-NP-pro / % Total		Total DO-IO / % Total		Total Double Object
m1 (1150-1250)	31	4.40	339	48.15	704
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Corpus Evidence

- **Remaining rate represents background scrambling rate for double objects**

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Learnability

- **Even by m1, there is insufficient evidence to postulate a unique DO-IO**
- **The declining rate then is due to lexical erosion**

Learnability

- **The Sufficiency Principle will not predict productivity**
- **DO-IO type frequencies**

Era	V-NP-pro (*M*)	Total DO-IO	Total Double Object
m1 (1150-1250)	13	90	155
m2 (1250-1350)	5	26	75
m3 (1350-1420)	1	51	98
m4 (1420-1500)	1	32	77
e1 (1500-1569)	1	39	100
e2 (1570-1639)	1	38	105
e3 (1640-1720)	0	34	98

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- **Languages with a dative-accusative distinction should not have a to-dative**
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*** modulo competing grammars**

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*** modulo competing grammars**

Under our model, there is no expected correlation

At best, more prepositions	→	**more opportunity for actuation**
More to-datives	→	**less unambiguous DO-IO**

Failures of Entailment

Faroese

- **Old Norse was like Old English: symmetric double obj, no to-dative, DAT-ACC**
- **Has DAT-ACC distinction, a to-dative, and no DO-IO double object**

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Faroese

- Old Norse was like Old English: symmetric double obj, no to-dative, DAT-ACC
- Has DAT-ACC distinction, a to-dative, and no DO-IO double object

Nepali

- Has DAT-ACC ambiguity (lai sometimes marks ACC as well as DAT)
- But has no to-dative

Failures of Entailment

Norwegian Dialects

- **Some have a DAT-ACC distinction on pronouns and definite nouns**
- **Yet have a to-dative, no DO-IO for full NP, have DO-IO for pronouns**

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ok ***ho ga kattåinn mat***

***** ***ho ga mat kattåinn***

“She gave the.cat.DAT food”

Failures of Entailment

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- **Yet have a to-dative, no DO-IO for full NP, have DO-IO for pronouns**

ok	*ho ga kattåinn mat*	ok	*ho ga ‘nå det*	(IO-DO)
*	*ho ga mat kattåinn*	ok	*ho ga det ‘nå*	(DO-IO)
		ok	*ho ga det åt ‘nå*	(to-dative)
	“She gave the.cat.DAT food”		“She gave it to him.DAT”	

Conclusions

- **The cause of change should be taken seriously**
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- **The cause of change should be taken seriously**
- **As a primary research goal**
- **As a secondary research goal**

- **Acquisition-driven change directly accounts for the English to-dative**
- **What other problems can it solve?**

Questions?

Slides available:

ling.upenn.edu/~jkodner