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Estimative constructions in cross-linguistic perspective

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Abstract: This article deals with estimative (also called 'tropative') constructions meaning 'find/consider *X* to be *Y*', where *Y* stands for a noun or an adjective. It systematically investigates morphological estimatives and their relationship to causative, applicative and denominal derivations from synchronic and diachronic perspectives. In addition, the article presents a survey of periphrastic estimative strategies in the world's languages.

Keywords: applicative; causative; comparative; equipollent derivations; estimative; evaluative; incorporation; tropative

1 Introduction

The terms 'estimative' (Joüon and Muraoka 2006: 144), 'evaluative' (Nolasco 2022; Payne and Oyzon to appear), 'tropative' (Jacques 2013; Larcher 1996; Tarasov 2018; Tarasov and Orekhov 2021), 'censive' (Hakulinen 1961: 197–198), or 'sensitive' (Janhunen 2010: 146) have been used in previous research to refer to verbal derivations meaning 'consider *X* to be *Y*'. Few languages have productive and dedicated derivations expressing this meaning; it is conveyed by periphrases or multiclausal strategies in most of the world's languages. Very few detailed studies exist on these constructions even in those languages which do have estimative morphology.

This paper is a cross-linguistic investigation of estimative constructions.[1] It comprises six sections. First, I propose a terminological framework to describe these constructions. Second, I survey all known cases of estimative derivations

1 I adopt here Croft's (2014: 537) distinction between *constructions* (expressing 'a particular combination of semantic structure and information packaging function') and *strategies* (a construction 'that is further distinguished by certain characteristics of grammatical form that can be defined in a crosslinguistically consistent fashion').

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by affixal or non-concatenative morphology. Third, I discuss periphrastic estimative strategies, involving a transitive verb or a grammaticalized auxiliary. Fourth, I briefly present cases of unmarked estimative strategies, involving zero derivation from adjective or noun into a transitive verb. Fifth, I present data on constructions deriving from estimatives. Sixth, I propose some preliminary generalizations concerning estimative constructions in the world's languages.

2 Estimative: definition and terminology

This section presents a basic definition of estimative constructions, specifying which constructions are included, and which are excluded from it. It describes the alignment types that are used to classify these constructions in the rest of the article. In addition, it provides an account of how the data were collected.

2.1 Basic definitions

The comparative concept[2] 'estimative' corresponds to a construction meaning '*X* finds/considers *Y* to be *Z*', where *Z* is a noun, an adjective, or a stative verb (depending on how word classes are defined in a given language) describing a class of entities or a property (the PARAMETER), and *Y* (the ESTIMEE) is a participant who is ascribed the property *Z* by a sentient entity *X* (the ESTIMATOR), as illustrated with Lakota (lako1247, Siouan) in (1).[3]

(1) Lakota (Ullrich 2008: 585)
wašté-wičha-wa-lake
good-3PL.O.ANIM-1SG:ACTIVE-ESTIM
PARAM-ESTIMEE-ESTIMATOR-ESTIM.MARKER
'I like them.' (literally, 'I consider them good')

In the base constructions from which estimative constructions are derived, the ESTIMEE corresponds to the intransitive subject (indexed as a suffix in (2)), and no ESTIMATOR is present.

(2) Lakota
wašté-pi
good-PL
'They are good.'

2 On the notion of 'comparative concept', see Haspelmath (2010).

3 This terminology is inspired by the terminology used for comparative constructions (Dixon 2008; Haspelmath and Buchholz 1998).

The ESTIMATIVE MARKER can be a derivation as in Lakota or a periphrastic construction. Many languages have several estimative strategies, which differ according to the estimative marker (for instance in English, in addition to *consider*, *find* or *deem* are also possible, with slightly different semantics).

Estimative constructions are not widely discussed in the grammars of European languages or in the typological literature, but they have been studied in traditional Arabic grammars (Larcher 1996) and by specialists of Old Chinese syntax, who refer to them as 意動用法 *yìdòng yòngfǎ* 'estimative use (of nouns and adjectives)' (Wang 1962: 348).[4]

2.2 Partial and quasi-estimative constructions

Partial estimative constructions, lacking an explicit ESTIMATOR or ESTIMEE, are excluded from the scope of this work, except when they are morphologically related to a prototypical estimative construction (Section 5.1). For instance, in Quechua (ayac1239), the most common way of expressing an estimative meaning when the estimator is 1SG is to use a direct evidential form (3). However, since the estimator is not encoded and only implicitly construed as being first person, this construction is not estimative in the sense of the definition proposed above.

(3) Ayacucho Quechua
yuya-y-ni-yuq-hina-m
think-INF-EUPH-having-COMP-DIRECT.EVD
'(I) consider him to be intelligent.' (César Itier, unpublished corpus, pers. comm.)

In addition, constructions meaning 'consider that *Y* has/requires *Z*' (where *Z* is an abstract noun describing a feeling such as 'interest' or 'need'), 'have *Y* as a *Y*', 'call *Y* a *Z*' and 'treat *Y* as a *Z*' are semantically close to estimative constructions as defined above, but are not discussed in this article either.[5]

For instance, the suffix *-sin* in Turkish (nucl1301), which derives verbs such as *gerek-sin-* 'to find something necessary' from the noun *gerek* 'need' or *güç-sün-* 'to

4 'Estimative' as a language-specific derivation or as cross-linguistic comparative concept can thus be called 意動態 *yìdòngtài* 'estimative voice' and 意動範疇 *yìdòng fànchóu* 'estimative category' in Chinese, respectively.

5 However, derivations having both estimative and quasi-estimative interpretations are included. For instance, Sandawe (sand1273) *-m̥̀sé* can mean both 'think it/s/he/is *X*' or 'call it/him/her *X*' (Eaton 2010: 129).

find something hard to carry out, difficult to do' from *güç* 'effort' (Marcel Erdal, pers. comm.), is not counted as an estimative derivation in the strict sense, since the semantic relationship between the base noun and the derived verb cannot be glossed as 'consider to BE *Z*'.

2.3 Alignment types

There are two main alignment types in estimative constructions: direct and indirect estimatives.

In *direct estimative* strategies, the ESTIMATOR is encoded as a *transitive subject* (like the causer of a causative construction), while the ESTIMEE (the subject of the base construction, semantically a *stimulus*), becomes a non-subject argument, most often the direct object, but in some periphrastic strategies an argument within a subordinate clause. In languages with a nominative-accusative alignment, the ESTIMATOR is encoded in the nominative case, and the ESTIMEE in the accusative, or an oblique case such as the partitive (4) in Finnish (finn1318).

(4) Finnish
pahe-ksu-n *he-idän*
bad-ESTIM-1SG.PRS them-PL.GEN
PARAMETER-ESTIM.MRK-ESTIMATOR
käytös-tä-än
behavior-PART-3PL.POSS
ESTIMEE
'I disapprove of their behavior'. (Juho Pystynen, pers. comm.)

In languages with ergative-absolutive alignment in case marking like Japhug (japh1234), the ESTIMATOR is in the ergative and the ESTIMEE in the absolutive, as in (5) (Jacques 2021b: 869).

(5) *[nɯ {tɤru ɯ-tɕɯ}* *nɯ kɯ] nɯɕimɯma ʑo*
DEM chieftain 3SG.POSS-son DEM ERG immediately EMPH
ESTIMATOR
[iɕqʰa *tɕʰeme* *nɯ] ɲɤ-nɤ-mpɕɤr*
the.aforementioned girl DEM IFR-ESTIM-be.beautiful
ESTIMEE TAME-ESTIM.MRK-PARAMETER
'The prince immediately found the girl very beautiful.' (https://doi.org/10.24397/pangloss-0004026#S51)

Indirect estimative strategies encode the ESTIMEE as intransitive subject (in the nominative or absolutive case, depending on the language), and the ESTIMATOR as an

oblique participant, using the oblique case (or oblique indexation) typical of experiencers. A strategy of this type exists in English (6) and most languages of Europe.

(6) *It looks nice to me*
ESTIMEE ESTIM.MRK PARAM ESTIMATOR

Morphological indirect estimative constructions are rarer than direct ones, but can be illustrated by (7) from Abaza (abaz1241, North-West Caucasic), where the ESTIMATOR is encoded in verbal indexation as a dative argument.[6]

(7) Abaza (Tabulova 1976: 184–185)
j-sə-ma-bz-p'
3SG-1SG:DAT-ESTIM-good-PRS
ESTIMEE-ESTIMATOR-ESTIM.MRK-PARAM-TAME
'It looked nice to me.'

2.4 Controlled versus non-controlled estimatives

Some Philippine languages have a contrast between a spontaneous/non-intentional evaluation (8a), and an intentional evaluation (8b).[7]

(8) Cebuano (cebu1242) (Tanangkingsing 2009: 368), Ricardo Nolasco, pers. comm.
a. *na-maʔot-an=ko* *sa=babayi*
REALIS:SPONTANEOUS-ugly-APPL=1SG.ABS OBL=woman
'I perceive/feel the ugliness of the woman.' (Subject does not have prior knowledge of ugliness of the woman.)
b. *gi-maʔot-an=ko* *sa=babayi*
REALIS-ugly-APPL=1SG.ABS OBL=woman
'I am consciously aware of the ugliness of the woman.' Lit., 'I really feel that the woman is ugly.' (Subject is biased against the woman and exerts an effort to emphasize her ugly appearance.)

Following the terminology used in the case of perception verbs (Evans and Wilkins 2000; Viberg 1984), this can be described as a contrast between *non-controlled* and *controlled* estimatives, respectively.

6 For a concise account of Abaza morphosyntax, see Arkadiev (2020).
7 The glosses in (8) and other examples in this article have been made uniform, but the translations and the notes are from Tanangkingsing (2009: 368).

While no such morphological contrast has been observed elsewhere, some estimative strategies favor one or the other interpretation. For instance, the Cavineña estimative verb *mu-ba* 'fear' from *mu* 'be scary' is a non-controlled estimative, whose controlled counterpart would instead mean 'think/have the opinion that *X* is scary'.

2.5 Data collection

This study is based on data collected either first hand or from examples collected from grammars, dictionaries and text collections.[8] Since estimative constructions are not usually explicitly described in grammars, the information is often difficult to extract, except in languages with estimative derivations. Even in languages with very detailed grammars, the relevant information is rarely specified, and for this study has had to be collected from language experts.[9]

Tarasov (2018, 2021) and Tarasov and Orekhov's (2021) survey of estimative constructions was invaluable, though I only became aware of its existence after the first submission of this manuscript. It contains data on 186 languages from 33 language families, with a strong focus on Indo-European (69 languages) and Uralic (18 languages).[10] Tarasov and Orekhov's (2021) database counts 15 'grammatical tropatives', corresponding to both estimative derivations (treated in Section 2) and dedicated estimative auxiliary verbs (Section 3.3).[11] The remaining 171 languages

8 I systematically looked in translations for verbs such as 'consider', 'find', 'deem' in English or their equivalents in other languages (such as '*считать*' in Russian).

9 I had to request the help of the following friends and colleagues, who kindly offered data and interpretation: Aimée Lahaussois (Kiranti), José Andrés Alonso de la Fuente (Inuktitut, Ainu), Michel Antelme (Lao), Anton Antonov (Abaza), Peter Arkadiev (North-West Caucasic languages), Élodie Blestel (Guarani), Claire Bowern (Bardi), Denis Creissels (Hungarian), Marcel Erdal (Turkic languages), Nicholas Evans (Kayardild, Bininj Gunwok), Alain Fabre (Nivaclé), Sebastian Fedden (Mian), Galambos Imre (Hungarian), César Itier (Quechua), Hélène Gérardin (Georgian), Antoine Guillaume (Cavineña), Katharina Haude (Movima), Jack Martin (Koasati), Amina Mettouchi (Kabyle), Ricardo Ma. Duran Nolasco (Philippine languages), Dara Non (Khmer), Sara Pacchiarotti (Bribri), Enrique Palancar (Yuhu), Juho Pystynen (Saami, Finnish), Lameen Souag (Arabic), Gasagusen Sulaibanov (Dargi), Yvonne Treis (Kambaata), Valentina Vapnarsky (Yucatec), Mark van de Velde (Eton), Valentin Vydrin (Bambara), Fernando Zúñiga (Mapudungun).

10 These figures exclude the artificial and sign languages in this database, and do not include creoles with Indo-European lexifiers.

11 The examples in his database that were lacking in the first version of this paper were added to the present work, except for Aymara. Tarasov and Orekhov (2021) list Aymara as having an estimative marker *-wa* limited to first person, but Coler (2014: 535–536) analyses *-wa* as a declarative suffix, and the Aymara construction in question is only a partial estimative construction, like the Quechua example (3) above.

are listed as having 'syntactical' or 'semantical tropatives', corresponding to 'periphrastic' (Section 3) and 'zero-marked estimatives' (Section 4) in this paper.[12]

The supplementary file contain data and references on 80 languages from 43 families, thus fewer languages than Tarasov and Orekhov (2021), but from more language families, especially from the Americas. Although there is some overlap between the two datasets, they can be seen as complementary.

Most languages in the sample are represented by only one strategy. However, the fact that even a language lacking morphological estimatives such as French has at least six different estimative strategies (Section 3.3), suggests that most languages have more than one strategy, and that the present sample underestimates the diversity of available possibilities.

3 Estimative derivations

In estimative derivations, the ESTIMATIVE MARKER is an affix or a morphological process applied to the PARAMETER, that turns it into a transitive verb (in the case of direct estimatives) or into an intransitive verb with an oblique argument (in the case of indirect estimatives).

Morphological estimatives are the easiest to identify in grammars, but also the rarest. All 36 examples known to me are listed in Table 1: they are found in Eurasia, Africa and the Americas, without any example from Australia and Papunesia. The data in the columns 'Base' and 'Type' are discussed in the following sections.[13]

The estimative affixes of Siglitun (sigl1242), Ojibwe (ojib1241), Japhug (japh1234), North Saami (nort2671) and Cebuano (cebu1242) have cognates in related languages and the first four are reconstructible with an estimative function to proto-Eskimo (*-kə, Fortescue et al. 2010: 443), proto-Algonquian (Section 2.1.2 and Section 2.4.1), proto-Gyalrong (Section 2.4.3) and proto-Saami (*-hčę, Sammallahti 1998: 93), respectively. These five languages are taken as representatives of the entire groups, though additional examples are provided in the supplementary materials. It would be easy to inflate the total number of estimative derivations by integrating all the languages in these five groups.

12 Tarasov and Orekhov (2021) under-report some morphological estimatives: Cree, Tagalog, Finnish and Mongolian are listed as only having periphrastic constructions.

13 In the column 'Alignment', Dir. and Ind. stand for 'Direct' and 'Indirect' alignments, respectively. In the column 'Productivity', (P) indicates that the derivation is productive, and if not the number of examples is provided between brackets. In the column 'Type', ded. stands for 'dedicated', caus. for 'causative', denom. for 'non-specific denominal verbalizing derivation' (as opposed to dedicated denominal estimative, which is marked as 'ded.'), appl. for 'applicative', desid. for 'desiderative' and incorp. for 'incorporation'.

Table 1: Known examples of morphological estimatives.

Family	Language	Form	Alignment	Base	Type	Productivity	Reference
Eskaleut	Siglitun (sigl1242)	*-gi*	Dir.	SV	ded.	P	Lowe (2001: 199)
Siouan	Lakota (lako1247)	*-lakA*, *-la*	Dir.	V	ded.	P	Ullrich (2008: 317)
Turkic	Turkish (nucl1301)	*-(im)sA-*,	Dir.	N/Adj	ded.	P	Göksel and Kerslake (2005: 56)
NWC	Abaza (abaz1241)	*ma-*	Ind.	V	ded.	P	Tabulova (1976: 184–185)
Tungusic	Nanai (nana1257)	*-si*	Dir.	N/Adj	ded.	P	Onenko (1980: 551)
Mongolic	Khalkha (halh1238)	*-šAA-*	Dir.	Adj	ded.	P	Janhunen (2010: 146)
Algic	Ojibwe (ojib1241)	*-enim*, *-endan*	Dir.	bound stem	ded.	P?	Livesay and Nichols (2021)
ST	Japhug (japh1234)	*nɤ-*	Dir.	V	ded.	P	Jacques (2013)
Uralic	North Saami (nort2671)	*-š-*	Dir.	N/Adj	ded.	n.P	Korhonen (1981: 38)
Uralic	Finnish (finn1318)	*-ksu*	Dir.	Adj	ded.	4	Hakulinen (1961: 197–198)
AN	Ilocano (ilok1237)	*tagi- … -en*	Dir.	V	ded.	P	Rubino (2000: 588)
IE	Greek (anci1242)	*-iz-*	Dir.	Adj	denom.	1	(Personal knowledge)
Tungusic	Manchu (manc1252)	*-la*, *-ša*	Dir.	N/Adj	denom.	5	Norman (2013)
Tungusic	Evenk (even1259)	*-tā*, *-tē*, *-tō*	Dir.	N	denom.	?	Vasilevich (1958: 790)
(is.)	Mapudungun (mapu1245)	*-ntu-*	Dir.	Adj	denom.	6	Smeets (2008: 127)
Turkic	Tuvan (tuvi1240)	*-ɨɨrga*	Dir.	N/Adj	denom.	P	Isxakov and Pal'mbal (1961: 269–270)
Semitic	Arabic (stan1318)	Form X	Dir.	V	caus.	P?	Larcher (1996)
Semitic	Amharic (amha1245)	$aC_1C_1aC_2C_2äC_3ä$	Dir.	V	caus.	n.P	Leslau (1995: 476; 488)
Uralic	Tundra Nenets (nene1249)	*-kəbta*	Dir.	Adj	caus.	24	Stenin (2015: 120–121)
ST	Old Chinese (oldc1244)	*-s	Dir.	V/N/Adj	caus.	3	Jacques (2016b)
Salish	Halkomelem (musq1240)	*-stəx*^{w}	Dir.	V	caus./appl.	3	Suttles (2004: 239)
(is.)	Movima (movi1243)	*-poj-*	Dir.	Adj	caus.	1	Haude (2006: 151)
(is.)	Kwaza (kwaz1243)	*-dy-*	Dir.	V	caus.	P?	van der Voort (2004: 368)
Siouan	Omaha (omah1248)	*-the*	Dir.	N	caus.	3	Marsault (2021: 279)
NWC	Adyghe (adyg1241)	*š*^{w}*e-*	Ind.	V	appl.	P	Letuchij (2009: 360–362)

Table 1: (continued)

Family	Language	Form	Alignment	Base	Type	Productivity	Reference
Matacoan	Nivaclé (niva1238)	*-julh-X-m*	Ind.	V.	appl.	P	Fabre (2016: 344)
AN	Cebuano (cebu1242)	*-an*	Ind.	V	appl.	n.P	Tanangkingsing (2009: 368)
(is.)	Ainu (ainu1240)	*e-*	Ind.	V	appl.	1	Tamura (1996: 90)
Muskogean	Koasati (koas1236)	*im-*	Ind.	V	appl.	2	Kimball (1994)
Witoto	Murui (muru1274)	*-rui*	Dir.	Adj	Section 2.2.6	P	Wojtylak (2017: 286; 549)
(is.)	Sandawe (sand1273)	*-m̰̊sé*	Dir.	N/Adj	desid.?	P	Eaton (2010: 129)
Yukaghir	Tundra (nort2745)	*-gii*	Dir.	V	?	n.P	Kurilov (2001: 88; 115)
UA	Nahuatl (clas1250)	*-itta* 'see', etc	Dir.	N/Adj	incorp.	P?	Wimmer (2006)
Tacanan	Cavineña (cavi1250)	*-ba* 'see'	Dir.	Adj	incorp.	2	Guillaume (2008: 377)
Sahaptian	Nez Percé (nezp1238)	*-neki* 'consider'	Dir.	N	incorp.	3	Aoki (1994: 314; 474; 768)
Oto-Manguean	Yuhu (east2556)	*nu-* 'see'	Dir.	N	incorp	3	Echegoyen and Voigtlander (2007: 179)

In the case of the Austronesian, Uralic, Siouan and Tungusic families, some languages are listed separately when their estimative affixes are not cognate.

3.1 Base forms

Estimative derivations differ in terms of the part of speech of the PARAMETER they take as input. Three main classes can be distinguished: intransitive stative verbs, nouns or noun-like adjectives, and bound stems that cannot occur as independent words.

3.1.1 Nouns/adjectives versus intransitive verbs

Estimative derivations which can take both nouns and adjectives as input, but no intransitive verbs include denominal estimatives as in Sandawe, Khalkha Mongolia, Nanai or Turkish (Section 2.2.4), and incorporating estimatives as in Classical Nahuatl (Section 2.2.5). Languages with either type of derivation have noun-like adjectives.

Estimative derivations taking intransitive verbs as input are a subtype of valency-increasing derivations. In some languages, they overlap with other valency-increasing derivations such as the causative (Section 2.2.2) or the applicative (Section 2.2.3), but dedicated direct estimatives constitute a distinct subtype (Section 2.2.1).

Valency-increasing estimative derivations, whether dedicated or non-dedicated, are generally incompatible with nouns. For instance, in Japhug, neither nouns nor copulas can be turned into estimative verbs; the only way to express the meaning 'consider to be NOUN' is by means of a periphrastic strategy (see (28) below).

An apparent example of estimative derivation compatible with both nouns and verbs would be Siglitun, whose estimative *-gi* suffix (10) has a corresponding denominal *-gi*, but its denominal counterpart has a non-estimative meaning 'have *X* as a *Y*' (9) rather than 'consider *X* as a *Y*'.[14]

(9) Siglitun (Lowe 2001: 198)
ui-gi-ya-a
husband-DENOM-INDICATIVE.TR-3 → 3
'She is married to him' (from *ui* 'husband')

(10) Siglitun (Lowe 2001: 199)
a. *nakuu-yu-q*
be.good-INDICATIVE.INTR-3
'It is good'

14 Yupik (cent2127) has a cognate suffix with the two functions (Miyaoka 2012: 990–994).

b. *nakuu-gi-ya-a*
be.good-ESTIM-INDICATIVE.TR-3 → 3
'He finds it good.'

3.1.2 Bound stems

Algonquian languages stand out among the other families in the sample in that their estimative derivations do not take an independent verb, noun or adjective as base, but rather they are bound forms which do not belong to a particular part of speech, either preverbs or initial stems (Goddard 1990).

In Ojibwe for instance, estimative verbs are built by combining these bound forms with the transitive final stems *-enim-* (for transitive verbs taking animate objects, VTA) and *-endan-* (for transitive verbs taking inanimate objects, VTI), meaning 'by mental action', 'think about' (Valentine 2001: 460).[15] The stems *-enim-* and *-endan-* also occur on verbs without an estimative meaning (for instance *gik-enim* 'know', *wan-enim* 'forget'), but estimative is their only productive and predictable interpretation.

Since these transitive verbs form a paradigm with corresponding stative intransitive verbs with an adjectival meaning, the estimative derivation can be analyzed as a type of equipollent valency marking (Haspelmath 1990: 31; Zúñiga and Kittilä 2019: 90), without any obvious direction of derivation, as illustrated in Table 2, where estimative verbs are compared with the corresponding intransitive verbs (with animate (VAI) or inanimate (VII) subject). Since both the intransitive stative verbs and the estimative verbs have distinct overt derivations, one cannot argue that the latter derive from the former.

Table 2: Examples of estimative verbs with their intransitive counterparts in Ojibwe.

VAI/VII	VTA/VTI
agaash-iinyi (VAI) 's/he is small'	*agaas-enim* (VTA) 'think little of him/her'
agaas-aa (VII) 'it is small'	*agaas-endan* (VTI) 'think little of it'
zanag-izi (VAI) 's/he is difficult'	*zanag-enim* (VTA) 'think him/her difficult'
zanag-ad (VII) 'it is difficult'	*zanag-endan* (VTI) 'think it difficult'

15 Additional estimative verbs can also be derived using other final stems such as *-inaw-/-inan-* 'see *X* as *Y*', *-itaw-/-itan-* 'find *X* sound *Y*', *-ip-/-ipidan-* 'find *X* taste *Y*', *-imaam-/-imaadan-* 'find *X* smells *Y*' (see the supplementary materials).

Table 3: Estimative verbs built with the reflexes of the VTA final stem *-e·rem- across Algonquian.

Language	Reflex	Example	Reference
Meskwaki (mesk1242)	*-ênem-*	*sanak-ênem-* 'think s.o. difficult'	Goddard and Thomason (2005)
Plain Cree (plai1258)	*-eýim-*	*miýw-ēýim-* 'consider s.o. good'	Wolvengrey (2001)
Arapaho (arap1274)	*-eeneb-*	*bees-eeneb-* 'to think highly of s.o.'	Cowell and Moss (2006: 28)
Cheyenne (chey1247)	*-atam-*	*pėhév-atam* 'like, deem good'	Fisher et al. (2017)
Blackfoot (siks1238)	*-imm-*	*sakak-imm* 'cherish'	Frantz and Russell (2017)

The only cases where one could argue for a direction of derivation involves estimative verbs whose initial stem also exists as a preverb (for instance *agaasi-* 'small'), but this only involves four examples among the estimative verbs identified in Ojibwe.[16]

The Ojibwe final stems *-enim-* and *-endan-* 'by thought' have cognates in other Algonquian languages with identical function and can be reconstructed to proto-Algonquian as *-e·rem- and *-e·rent- (see Section 2.4.1 concerning their origin). Some estimative verbs have exact cognates across Algonquian, as shown in Table 3.

In Ojibwe, the final stems *-enim* and *-endan*, when combined with the relative root *in-*, yield the verbs *in-enim* (VTA) 'think of him/her a certain way' and *in-endan* (VTI) 'think of it a certain way' which are used in the periphrastic estimative strategy (Section 3.3), and can be used with preverbs, in particular *gichi-* 'big', as in (11).[17]

(11) Ojibwe (Parkhill 2019)

gaa-gichi-in-enim-ag	*ni-wiiw*
REL-big-thus-by.thought(VTA)-1SG → 3:CO	1.POSS-wife

'My incredible wife' (='my wife, whom I think of very highly')

Outside of Algonquian, equipollent estimatives are also marginally attested in Japhug, where one finds a handful of verb pairs such as *sɤ-ɕqa* 'be bearable' and *nɤ-ɕqa* 'endure' (Jacques 2021b: 1054), whose root *-ɕqa* does not exist as an independent word at least synchronically.

16 The complete list is provided in the supplementary materials.

17 Next to *gichi-in-enim* 'think highly of', we also find *git-enim* with the same meaning, built by directly combining the non-productive allomorph *git-* of *gichi-* directly to the final stem *-enim*.

3.2 Dedicated versus non-dedicated estimative derivations

3.2.1 Dedicated valency-increasing estimatives

Among the dedicated estimative derivations taking intransitive verbs as input (Section 2.1.1), both direct and indirect estimatives (Section 1.3) are found.

Dedicated *indirect estimatives* are only attested by one example in the sample, the *ma-* derivation in Abaza (example (7) above). This type of derivation is a subtype of *dative applicative*, preserving the argument of the basic construction as subject, and assigning dative function to the added ESTIMATIVE argument, which only differs from the cases discussed in Section 2.2.3 by its specifically estimative interpretation.

By contrast, dedicated *direct estimate* derivations differ from other valency-changing constructions in terms of semantic roles and syntactic functions. Thus, while in applicative derivations the stimulus/ESTIMEE is a subject in both the base and the estimative constructions (12a), in the case of direct estimative derivations the stimulus/ESTIMEE is non-subject, differing from the base construction, as illustrated in (12b).

(12) a. Applicative
$S \rightarrow A$
introduce *O* or dative argument
b. DIRECT ESTIMATIVE
$S \rightarrow O$ (stimulus)
introduce *A* (experiencer)

Direct estimatives also differ from causatives in that the participant they introduce (the ESTIMATOR) is an experiencer (13b), here illustrated with data from Japhug (Jacques 2013, 2021b: 868–874), whereas causatives introduce an agent (13a),

(13) a. Causative
Y *kɯ X* *to-ɣʁ-mpɕʁr*
AGENT ERG PATIENT IFR-CAUS-be.beautiful
'*Y* made *X* beautiful'
b. Direct estimative
Y *kɯ X* *ɲʁ-nʁ-mpɕʁr*
ESTIMATOR ERG ESTIMEE IFR-ESTIM-be.beautiful
'*Y* found *X* beautiful' (based on (5) above)

Direct estimatives also differ from causatives and applicatives in that they only take stative predicates as input (the PARAMETER).

Table 4: Direct valency-increasing estimative derivations and stimulus predicates.

Stimulus predicate	Estimative	Example
'*X* is scary'	'*Y* is afraid of *X*' =*Y* finds *X* scary'	Cavineña *mu*-**ba** 'fear' (Section 2.2.5)
'*X* is nice/good'	'*Y* likes *X*' ='*Y* finds *X* nice'	Lakota *waště*-***lakA*** 'like' (1)

Some adjectives or adjectival stative predicates express subjective properties, and implicitly entail the existence of an observer (such as '(be) scary' or 'be beautiful'). When an estimative construction applies to such a *stimulus predicate*, it serves to specify the implicit observer (the ESTIMATOR), as illustrated in Table 4, where *X* stands for the stimulus/ESTIMEE and *Y* for the experiencer/ESTIMATOR.

Direct estimative derivations from *stimulus predicates* yield the same result as object applicative derivations from *experiencer predicates* (adjective/stative verbs used with intransitive subjects whose semantic role is that of experiencer), as illustrated by (14a) and (14b).

(14) a. Direct estimative of stimulus predicate
X is scary → *Y* fears *X*
b. APPLICATIVE of experiencer predicate
X is afraid → *X* fears *Y*

In both cases, the derived verb encodes the experiencer as transitive subject and the stimulus as object.

3.2.2 Causatives

Given the similarity between causative derivations and direct valency-increasing estimatives (see example (13), Section 2.2.1) in terms of argument structure, it is not surprising that causative derivations have an estimative interpretation in some languages.

In Kwaza, the suffix *-dy* has both causative (15a) and estimative (15b) interpretations with some intransitive verbs such as *wai-* 'be good'. The productivity of this estimative interpretation is unknown.

(15) Kwaza (van der Voort 2004: 368)

a. *wãnỹ'dy wai-'dy-xa-ki*
food good-CAUS-2-DEC
'You made the food good.'

b. *mã'rɛʔa-tay* *wai-'dy-xa-re*
spirit-female good-CAUS-2-QU
'Do you find Western women good?'

In Standard Arabic, verbal derivations using the templatic pattern conventionally numbered X,[18] which is also used with a causative interpretation (for instance *kataba* 'write' → *istaktaba* 'ask to write'), can derive estimative verbs from stative verbs (Table 5). Unlike Kwaza however, template X forms either have a causative or an estimative interpretation, not both.

Some languages with a dedicated estimative also show examples of causative with an estimative interpretation, for instance Japhug (Jacques 2021b: 844–845).

3.2.3 Applicatives

In the sample the Abaza *ma-* dative applicative (Section 2.2.1 and example (7) above) is the only applicative derivation with dedicated estimative interpretation. In addition, Abaza has a non-productive *-ʃa* suffix (probably originally a verb meaning 'seem') found in a handful of uncommon verbs (16).

(16) Abaza (Arkadiev and Xasarokov, pers. comm.)
d-rəcx'a-s-ʃ-i-t'
3SG.H.ABS-poor-1SG.DAT-ESTIM-PRS-DECL
'I pity her.'

Applicatives with non-specific estimative interpretations are found in Philippine languages such as Cebuano (Section 1.4), Waray (Payne and Oyzon to appear) or Tagalog (Nolasco 2022),[19] and in Adyghe (Letuchij 2009: 360–362; Rogava and Kerasheva 1966: 265), a relative of Abaza.

Table 5: Estimative verbs from stative verbs in Arabic.

Base verbs	Estimative verbs (X) *istaf'ala*
ħasuna 'to be good'	*istaħsana* 'to deem to be good'
junna 'to be crazy'	*istajanna* 'to regard as crazy'
jahila 'to be ignorant of'	*istajhala* 'to consider ignorant'
qabuḥa 'to be ugly'	*istaqbaḥa* 'to consider ugly'

18 In triliteral roots $C_1C_2C_3$, form X follows the pattern *ista*$C_1C_2aC_3a$ in the past 3SG.M.

19 Not all Philippine languages form their estimative derivation in this way: in Ilocano the circumfix *tagi-* … *-en* is rather a dedicated direct estimative, with the ESTIMATOR in the ergative, and the ESTIMEE in the absolutive (Nolasco 2022).

In Nivaclé (niva1238, Matacoan), the benefactive *-m* is combined with the equative *-julh* to express estimative interpretation, as in (17).

(17) Nivacle (Fabre 2016: 344)
yi-vooi-julh-'a-m
3-be.correct-EQUATIVE-2-BEN
'It seems correct to you.'

3.2.4 Denominal/denominal estimatives

Dedicated denominal estimatives in the dataset are found in Turkish, Khalkha Mongolian and Nanai.[20]

In Turkish for instance, the estimative suffix *-(im)sA* can be added to nouns, adjectives, adverbs and even a pronoun in the case of *ben-imse-* (Table 6), but not to intransitive verbs.

The *-(im)sA* derivation is a direct estimative: the ESTIMATOR is encoded as the subject, indexed on the verb, and the ESTIMEE as the object, with accusative case when definite (18).

(18) Turkish
Ben *bunu* *garip-s-iyor-um*
1SG DEM:ACC strange-ESTIM-PRS-1SG
'I find this strange.'

Another Turkic language, Tuvan, has an unrelated denominal verbalizing derivation *-ɨ̈rga -ɨ̈rgan* (Isxakov and Pal'mbal 1961: 269–270) which has an estimative interpretation with some nouns or adjectives (*ažɨg* 'sour' → *až-ɨ̈rgan* 'find too sour'), but also conveys auto-estimative (*baj* 'rich (adj)' → *baj-ɨ̈rga* 'consider oneself rich') and can also mean 'show a particular characteristic'.

Table 6: Turkish estimative derivations.

Base words	Estimative verbs
büyük 'big'	*büyük-se-*, *büyü-mse-* 'to overestimate'
kötü 'bad'	*kötü-mse-* 'to think ill of'
garip 'strange'	*garip-se-* 'to find strange'
ben 'I'	*ben-imse-* 'adopt, embrace (= consider to be one's own)'

20 Sandawe could be added to this list, if the formal similarity of its denominal estimative suffix with that of the desiderative is fortuitous (Section 2.2.6).

In a few additional languages, including Greek, Manchu and Mapudungun, general denominal affixes have sporadic cases of estimative interpretation.

No case of denominal indirect estimative, whether dedicated or non-dedicated, is attested in the sample.

3.2.5 Incorporation

Incorporating estimative strategies are intermediate between derivations and periphrastic constructions. They combine a noun or a noun-like adjective (the PARAMETER) with a verb root serving as ESTIMATIVE MARKER, a type of strategy illustrated by (19) from Classical Nahuatl.

(19) Classical Nahuatl (Wimmer 2006)
qui-huel-mati-ya-h
3SG:O-well-know-PST.IPFV-PL:A
ESTIMEE-PARAM-ESTIM.MRK-ESTIMATOR
'They found it good.'

In addition to the transitive verb *-mati* 'know', Classical Nahuatl has incorporating estimatives with *-toca* 'follow' and the perception verbs *-itta* 'see' and *-caqui* 'hear' (Table 7).

The Tacanan language Cavineña also has a few examples of adjectives incorporated to the perception verb *ba-* 'see' such as *mu-* 'scary' → *mu-ba* 'fear' (Guillaume 2008: 377 and pers. comm. by Antoine Guillaume). The corresponding periphrastic estimative strategy also involves the verb *ba-* 'see' (example (34), Section 3.3).

3.2.6 Desiderative

Formal similarities between estimative derivations and modal derivations meaning 'want to' or 'like to' are found in Sandawe and Murui Witoto.[21]

Table 7: Examples of estimative verbs in Classical Nahuatl.

Base adjectives/nouns	Incorporated estimative verbs
tlâca-tl 'man'	*tlâca-itta* 'consider like a man'
yêc-tli 'virtuous'	*yêc-caqui* 'find nice (what one hears)'
teô-tl 'god'	*teô-mati* 'consider as a god'
icnîuh-tli 'friend'	*icnîuh-toca* 'consider as a friend'

21 An anonymous reviewer suggested that a possible hypothesis to account for the estimative/desiderative overlap might be grammaticalization from quotative markers, which are reported to express both thought and desire (Güldemann 2008: 425).

Table 8: The estimative and desiderative *-m̥̀sé* suffixes in Sandawe.

Base noun/adjective/verb	Estimative/desiderative verb
íó: 'mother'	*íó:m̀sé* 'think it is a mother'; 'say mother'
kʰõ: 'house'	*kʰõ:m̀sé* 'think it is a house'; 'say house'
ts'ámâsú 'giraffe'	*t'ámâsúm̀sé* 'think it is a giraffe'; 'say giraffe'
ɬá:ù 'good:3MS'	*ɬáûm̀sé* 'think it is good'; 'say good'
bàʔê̥ tʰé: 'big'	*bàʔê̥ tʰé:m̀sé* 'think it is good'; 'say good'
kʰʷà– 'return'	*kʰʷàm̀sé-* 'want to return'

In Sandawe, the denominal/deadjectival estimative suffix *-m̥̀sé* is homophonous with the desiderative suffix on verbs (Table 8, Eaton 2010: 72; 129), though it is unclear whether this similarity is indicative of a synchronic or diachronic relationship between the two suffixes.

In Murui Witoto, the suffix *-rui*, is described as meaning '(feel like) having a feature *X*' (Wojtylak 2017: 133) and as 'indicating that the subject considers an action desirable, and likes to perform it' (Wojtylak 2020: 294; 321). It is glossed as MANNER in Wojtylak (2017), and as FAN.OF in (Wojtylak 2020). However, while this suffix does have this modal function (20), it also has a clear estimative interpretation, as illustrated by (21) and (22), and the ESTIMEE *kaɨ uai-na* 'our language' is marked with the non-subject suffix *-na* (Wojtylak 2017: 277), showing that *-rui* is a valency-increasing derivation in this construction.

(20) Murui (Wojtylak 2020: 321)
maka-rui-dɨ-kue
walk-FAN.OF-LNK-1SG
'I like to walk, I like walking.'

(21) Murui (Wojtylak 2017: 282)
ua=mei uru-iaɨ=dɨ kaɨ
really=so child-CLF:GENERIC.PL=S/A.TOP 1PL
uai-na ebi-rui-ñe-d-e
word-NON.S/A.TOP nice-MANNER-NEG-LNK-3
'Children really don't find our language nice (anymore).'

(22) Murui (Wojtylak 2017: 549)
kaɨ jakɨ-rui-tɨ-kaɨ
1PL scary-MANNER-LNK-1PL
'But we are afraid (of it).'

More research is needed on the functions of this suffix (Wojtylak, pers. comm.), and in particular whether its modal and estimative interpretations are synchronically and/or historically related.

3.3 Auto-estimative

Two languages have specific auto-estimative derivations that are distinct from the estimative, and not compositional.

In Japhug, rather than adding the regular reflexive *ʑɣʁ-* prefix to the estimative *nʁ-*, the auto-estimative is built by adding *z-* and reduplicating the verb stem (*mpɕʁr r* 'be beautiful' → *nʁ-mpɕʁr r* 'consider to be beautiful' → *z-nʁ-mpɕɯ* ~ *mpɕʁr* 'consider oneself to be beautiful', Jacques 2021b: 995–996).

In Abaza, auto-estimative meaning is not expressed using the estimative applicative prefix *ma-* (7), but rather by combining the reflexive *tʂ* and the causative *rə-* (Tabulova 1976: 186).

3.4 Historical origins of estimative markers

Potential sources of estimative markers include the functions found in non-dedicated estimative constructions (causative and applicative). In addition, three sources of dedicated estimative affixes have been identified among the languages of the dataset.

3.4.1 Grammaticalization from lexical verbs

One of the sources of estimative affixes is grammaticalization from ancient estimative auxiliary verbs (Section 3.3).

The clearest case of this in the dataset is that of the Algonquian final stems *-e rem- and *-e rent- 'by thought' (Section 2.1.2). These stems are bound forms in all Algonquian languages other than Blackfoot, the first language to branch off from the rest of the family (Goddard 1994; all Algonquian languages other than Blackfoot form a clade).

In Blackfoot, by contrast, the independent verbs *imm* (VTA) and *i'tsi* 'feel emotion toward' (VTI) (Frantz and Russell 2017: 68; 129) still exist alongside the corresponding final stems *-imm* and *-i'tsi* (see Berman 2006: 269 for an account of the sound changes involved), and in this language the estimative strategy is of the incorporating type (Section 2.2.5).[22]

22 Blackfoot also differs from other Algonquian languages in its ability to incorporate nouns with the finals *-imm* and *-i'tsi*.

3.4.2 Denominal verbalization of translative case form

The estimative *-ksu* suffix in Finnish originates from the translative case *-ksi* case form of the base adjective, subjected to a denominal derivation (Hakulinen 1961: 197–198).

The translative case expresses a change into a state corresponding to the base noun/adjective (*vesi* 'water' → *vede-ksi* '(turn) into water)', *pitkä* 'tall' → *pitkä-ksi* '(grow) tall') (Hakulinen 1961: 70). This case form underwent denominal derivation with the *-u-/-y-* suffix found in transitive verbs such as *noit-u-a* 'bewitch' (from *noita* 'witch'), *puh-u-a* 'speak' (from *puhe* 'speech') or *laus-u-a* 'pronounce' (from *lause* 'clause'), and the result of this combination *-ks-u-* was reanalyzed as a single suffix *-ksu*.

Finnish *-ksu* possibly shares a common origin with the proto-Saami estimative *-hčče, (Sammallahti 1998: 93), suggesting that the estimative use of the translative goes back at least to their common ancestor.

3.4.3 Denominal verbalization of nominalized verb

The Japhug estimative prefix *nɤ-* (and its cognates in other Gyalrong language, such as *nɐ- in Situ*, Zhang 2020: 162–164) results from the reanalysis of a transitive denominal verbalizing derivation (*nɯ-/nɤ-*) from a nominalized verb form (Jacques 2021b: 1059–1066). As shown in Table 9, the prefix *nɤ-* can be used to derive transitive verbs from nouns prefixed in *tɤ-* (an indefinite possessor prefix).

Since abstract nouns in *tɤ-* can be derived from stative verbs, for instance *tɤ-mpɕɤr* 'beauty' from *mpɕɤr* 'be beautiful' (Jacques 2021b: 785), estimatives in *nɤ-* can be seen historically as a two steps derivation: nominalization (*mpɕɤr* 'be beautiful' → *tɤ-mpɕɤr* 'beauty') followed by verbalization (*tɤ-mpɕɤr* 'beauty' → *nɤ-mpɕɤr* 'find beautiful'). However, in synchronic terms, estimative verbs are directly derived from the base verbs, bypassing the nominalization stage (not all estimative verbs have corresponding abstract nouns). This derivation, although it involves a denominal stage, is markedly different from denominal estimatives (Section 2.2.4), which do not take nominalized verb forms as input, among the languages in the sample.

Table 9: Examples of transitive denominal verbalizing derivations in Japhug (Jacques 2021b: 1051).

Base noun	Transitive verb
tɤ-mbrɯ 'anger'	*nɤ-mbrɯ* 'get angry with'
tɤ-re 'laugh'	*nɤ-re* 'laugh, laugh at'
tɤ-lu 'milk'	*nɤ-lu* 'milk (a cow)'

4 Periphrastic estimative strategies

Periphrastic estimative strategies are by far the most common type of estimative strategies. Several of the languages with morphological estimative derivations also have competing periphrastic strategies, which are generally more frequent and have a broader range of uses than their derivational counterparts.

4.1 The parameter

With the exception of zero-marked estimative strategies (treated in Section 4.2), all periphrastic estimative strategies combine an estimative auxiliary verb (Section 3.3) with a nominal or adjectival PARAMETER, whose syntactic status can differ across constructions, even within a single language.

The status of the PARAMETER differs between languages with noun-like adjectives on the one hand, and languages where adjectives are a sub-class of stative verbs, as the latter require the PARAMETER to occur in a subordinate clause (see Section 3.2).

In the former, adjectives and nouns can occur in the same type of construction, as in Arabic (23), where the PARAMETER is an *object complement*, agreeing in case, gender and number with the ESTIMEE.

(23) Arabic (Lameen Souag, pers. comm.)

a. *ʔa-ʕtabiru-ki jamīlat-an*
1SG-consider:IPFV-2SG:F:ACC beautiful:F-ACC
'I find you beautiful'. (Lameen Souag, pers. comm.)

b. *ʔa-ʕtabiru-hu ṣadīq-ī*
1SG-consider:IPFV-3SG:M:ACC friend-1SG.POSS
'I consider him as my friend'

Some languages require the PARAMETER to receive a special case distinct from the ESTIMEE, for instance the instrumental in Russian (russ1263, IE) (24), which also uses two different estimative auxiliary verbs for nouns and adjectives (Section 3.3).

(24) Russian

a. *Ja naxožu tebja krasiv-oj.*
1SG:NOM find:1SG:PRS 2SG:ACC beautiful-F.SG:INSTR
'I find you beautiful.'

b. *Vse sčitajut ego durak-om.*
all:PL count:PRS:3PL 3SG:M:ACC idiot-SG.INSTR
'Everybody considers him an idiot.' (Creissels 2014: 616)

The use of the instrumental in (24) is one of the many distinct constructions other than instrumental proper in which this case occurs. In particular, it also occurs in *functive* function, 'expressing the property of *fulfilling the role* of the noun' marked with this case (Creissels 2014: 609), as illustrated by (25).

(25) Russian (Creissels 2014: 615)
On rabotaet inžener-om.
3SG:M work:PRS:3SG engineer-SG.INSTR
'He is working as an engineer.'

However, in Hungarian (hung1274, Uralic) which has a specific Essive case *-ként* used for functive phrases (Creissels 2014: 617), it is striking that the dative is used instead to mark nominal or adjectival PARAMETERS of estimative constructions, as shown in (26).

(26) Hungarian

a. *Én gyönyörű-nek talál-om ő-k-et*
I beautiful-DAT find-1SG:TR 3SG-PL-ACC
'I find them beautiful.'

b. *Barát-nak tart-om ő-t*
friend-DAT hold-1SG:TR 3SG-ACC
'I consider him/her as a friend.'

This example illustrates that even though functive phrases and PARAMETERS of estimative construction can bear similar case forms in some languages, these two categories are distinct in a cross-linguistic perspective.

4.2 Multiclausal estimative strategies

In some estimative strategies, the PARAMETER is embedded in a subordinate clause, sometimes together with the ESTIMEE. The clause containing the PARAMETER is more often a complement clause, but cases of relative and converbial clauses are also attested.

4.2.1 Complement clauses

In English, the estimative auxiliary verb *consider* can either mark the PARAMETER with the preposition AS (I consider you *as a friend*) or express the same meaning with a complement clause headed by a copula, in which the PARAMETER is the nominal predicate (I consider *that you are a friend*). In the first case, the ESTIMEE is treated as

the direct object of CONSIDER, while in the second one, it serves as the subject of the complement clause.

The distinction between monoclausal and multiclausal estimative strategies is not always trivial. In Arrernte (east2379, Pama-Nyungan) for instance, the PARAMETER (the adjective *lhwarrpe* 'sad' in (27)) is a secondary predicate agreeing in case with the object, but in the absence of an overt complementizer and of a copula it is not obvious whether [*Margie lhwarrpe*] is a complement clause or whether this construction is monoclausal and its PARAMETER is an object complement as in Arabic (23).

(27) Arrernte (Wilkins and Evans 1998: 15)
the Margie lhwarrpe are-me
1:ERG Margie:ABS sad:ABS see-N.PST
'Margie looks sad to me'; lit. 'I saw Margie sad'.

4.2.2 Relative clauses

Some languages use relative clauses rather than complement clauses to allow stative verbs to serve as PARAMETERS in their periphrastic estimative construction.

For instance, in Japhug, the estimative auxiliary verb *sɯpa* 'consider' (causative of *pa* 'do'), which serves to build the estimative strategy with nominal PARAMETERS (Jacques 2021b: 1350), can only be used with adjectival stative verbs PARAMETERS if they are a subject participle form with the prefix *kɯ-* as in (28).

(28) Japhug
tɕe nɯ [kɯ-mpɕʁr] tu-nɯ-sɯ-pa-nɯ ŋu.
LNK DEM SBJ:PCP-be.beautiful IPFV-AUTO-CAUS-do-PL be:FACT
'They consider it to be beautiful (They consider it as something that is beautiful).' (Pangloss collection: https://doi.org/10.24397/pangloss-0003720#S113)

In (28), the PARAMETER *kɯ-mpɕʁr* is a headless participial clause literally meaning 'something that is beautiful'.

4.2.3 Converbs

Aside from complement and relative clauses, some languages embed the PARAMETER in a converbial clause.

For instance, in Kambaata (kamb1316, Cushitic), the PARAMETER *ciil-l-áta* 'infants' occurs in a clause headed by a converbial form of the verb 'do' *ass-ít*, which is obligatory in this construction (29).[23]

(29) Kambaata (Yvonne Treis, pers. comm.)
Ám-at oos-ú-se [ciil-l-áta
mother-F.NOM children-F.ACC-3F.POSS infant-PL1-F.ACC
ass-ít] xuud-dáa'u
do-3F.PFV.CONV see-3F.IPFV
'The mother (still) considers her children to be infants.'

4.3 Estimative auxiliary verbs

Estimative auxiliary verbs belong to six main semantic classes: perception verbs (in particular 'see'), manipulation verbs ('hold, get, catch'), cognition verbs ('think, consider, deem'), 'find',[24] 'count', 'make' and a handful of others ('seem', 'compare' and 'follow'). The dataset in the supplementary files counts 41 languages on which information about periphrastic estimative strategies is available, sometimes in addition to estimative derivations.

In nearly all contemporary languages of Europe (including Hungarian), the most frequent estimative strategy uses a verb meaning 'find'. However, this appears to be an areal feature limited to Standard Average European, and absent elsewhere. In Arabic for instance, using *wajada* 'find' as an estimative verb is interpretable, but feels like translationese to native speakers (Lameen Souag, pers. comm.). This is not an inherited feature in languages of Europe, since Ancient Greek and Latin used different verbs in their estimative strategies (respectively meaning 'think' and 'hold').

Chukotko-Kamchatkan languages have dedicated estimative auxiliary verbs, *ləŋ/-łɣ-* in Chukchi (chuk1273, Dunn 1999: 310, 321) and *ləŋək* in Koryak (kory1246, Moll 1960: 67), and Tarasov (2018) classifies them as 'grammatical tropatives' together with morphological estimatives, but I analyze them as a special subclass of periphrastic estimatives since they are not bound forms, and conjugate like verbs.

Some estimative strategies involve a noun-verb collocation rather than an isolated verb. For instance, in Warlpiri (warl1254, Pama-Nyungan), the verb *nyanyi*

23 An example of this estimative strategy appears in Treis (2008: 290), but (29) (provided by Yvonne Treis, pers. comm.) is more appropriate for this survey.

24 Hence the term 'tropative', from the Latin ancestor *tropare* of French *trouver* 'find'.

'see' occurs with the ergative/instrumental of the noun *miyalu* 'stomach' to express estimative interpretation (30).

(30) Warlpiri (Laughren et al. 2007)
Nyuntu ka-rna-ngku miyalu-rlu nya-nyi ngurrju.
2SG PRS-1SG:SBJ-2SG:OBJ stomach-ERG see-N.PST good
'I like you. I think that you are good.' (literally 'I see you (as) good by (my) stomach.')

Many, if not most, languages of the world have several competing estimative strategies with different estimative verbs. French for instance, which lacks a morphological estimative, has at least two indirect (31a, 31b) and four direct estimative (31c, 31d, 31e, 31f) strategies, each involving a different verb or verb-noun collocation. The parameter is either an adjective (31a, 31b, 31c) in *object complement* function, a direct object (31c) or a prepositional phrase with *comme* 'as', *pour* 'for' or *parmi* 'among' when the parameter is a noun. The first three strategies (31b, 31c, 31d) also have a corresponding multiclausal form with a complement clause.

These strategies have near-equivalents in English (see for example Hampe 2011) and many languages of Europe, and can be taken as representative of Standard Average European.

(31) French

a. *Elle me semble intelligente.*
3SG:F.NOM 1SG:DAT seem:PRS:3SG intelligent:F.SG
'She looks intelligent to me.'

b. *Elle m'a l'air intelligente.*
3SG:F.NOM 1SG:DAT.have:PRS:3SG DEF.M.SG.appearance intelligent:F.SG
'She looks intelligent to me.'

c. *Je la trouve intelligente.*
1SG:NOM 3SG:F:ACC find:PRS:1SG intelligent:F.SG
'I find her intelligent.'

d. *Je le considère comme un ami.*
1SG:NOM 3SG:M:ACC consider:PRS:1SG as INDEF:M.SG friend
'I consider him as a friend.'

e. *Je le tiens en grande estime/pour un ami.*
1SG:NOM 3SG:M:ACC hold:PRS:1SG in big:F.SG regard/for INDEF:M.SG friend
'I hold him in high regard/I consider him as a friend.'

f. *Je le compte parmi mes amis.*
1SG:NOM 3SG:M:ACC count:PRS:1SG among my:M.PL friend:PL
'I count him among my friends.'

These strategies are not perfectly identical. Indirect (31b, 31a) strategies are more appropriate to express non-controlled estimative interpretation (Section 1.4), though there is no strict contrast comparable to that attested in Cebuano (8).

Indirect (31b, 31a) and 'find' estimatives (31c) can only take an adjective as PARAMETER, and are not compatible with nouns, while 'consider' (31d), 'hold' (31e) and 'count' (31f) estimatives only take nominal PARAMETERS. An adjective must occur with a noun in order to serve as PARAMETER with *considérer*, as in (32).

(32) French
Je le considère comme quelqu'un
1SG:NOM 3SG:M:ACC consider:PRS:1SG as someone
d'intelligent
of-intelligent.M.SG
'I consider him to be intelligent.'

Among these strategies, (31e) and (31f) belong to the formal register, are rarely used in the spoken language, and can only be used with a limited number of nominal parameters. The indirect estimative (31b) belongs to the colloquial register, while the strategies illustrated by (31c) and (31d) are the most productive and neutral from the point of view of speech register.

Some languages distinguish between periphrastic estimative strategies not in terms of word class and speech register, but in terms of semantic differences. For instance, Kayardild (33) uses the perception verbs *niwan-*, 'see', *marri-*, 'hear' and *karrma-* 'grasp' (here used not as a manipulation verb, but as a verb of tactile perception) depending on the source on which the ESTIMATOR's perception is based.[25]

(33) Kayardild (Wilkins and Evans 1998: 15–16)

a. *ngada kurri-ja niwan-ji mibulk-i.*
1SG.NOM see-N.FUT him-OBJ asleep-OBJ
'I saw him asleep.'; 'He looked asleep to me.'

b. *malangarrba-ya ngada marri-ja dathin-ki dangka-y.*
drunk-OBJ 1SG.NOM hear-N.FUT that-OBJ man-OBJ
'That man sounded drunk to me.'

c. *ngada karrma-tha dangka-ya murldi-n-ki*
I grasp-ACT person-OBJ be.soft-N-OBJ
'This person feels smooth to me', lit. 'I grasped this person soft.'

Estimative auxiliary verbs are similar to incorporating estimatives (Section 2.2.5), the main difference between them being the fact that in the former, the parameter is an

25 Incorporating estimative strategies as in Classical Nahuatl (Section 2.2.5) or the estimative final stems in Algonquian (Section 2.1.2, footnote 14) can also express similar contrasts.

independent word, while in the latter it is incorporated. Cavineña offers striking evidence for the closeness between the two strategies, since the estimative verb *ba-* 'see'[26] also incorporates the PARAMETER in a few cases: compare the periphrastic strategy in (34) to the corresponding incorporating verb *mu-ba* (scary-see) 'fear'.

(34) Cavineña (Guillaume 2008: 377–379)
Mu-da=taa e-ra ba-ya [jee=ke e-majaka]
scary-ASF=EMPH 1SG-ERG see-IPFV here=LIG NPF-space
'I'm scared of this place (lit. I see this place scary).'

5 Zero-marked estimative constructions

5.1 Zero conversion

Zero-marked estimative derivations are direct conversions from nouns and/or adjectives to direct estimative verbs, without any derivational marking.

This phenomenon is particularly prominent in Old Chinese, a topic to which a considerable amount of scholarship has been devoted (Wang 1962: 348). Old Chinese has a non-zero estimative derivation, which is marked by the departing tone in Middle Chinese[27] and is generally reconstructed as a *-s suffix following Haudricourt (1954). However, this alternation is only attested on a limited number of examples. The main strategies are either 'see' or 'do' estimate verbs, or zero-marked estimatives. Both adjectives and nouns can be converted to estimative verbs: in (35a) and (35b), 美 *mijX* 'beautiful' and 利 *lijH* 'profit' are used as 'find beautiful' and 'find advantage in', respectively.[28]

(35) Old Chinese

a. 見棠姜而美之
kenH daŋ.kjaŋ ɲi mijX tɕi
see Tang.Jiang LNK beautiful DEM
'Upon seeing (Tang) Jiang, (Cui Zhu) was struck with her beauty.'
(Zuozhuan, Xiang, 25, translation by Durrant et al. 2016)

26 The same strategy is found in other Tacanan languages, in particular Ese Ejja (Vuillermet 2012: 552).

27 The departing tone is transcribed as *-H* in Baxter's (1992) system. The most representative examples (from Downer 1959) are 好 *xawX* 'good' → 好 *xawH* 'like' and 惡 *ʔak* 'bad' → 惡 *ʔuH* 'hate', from Old Chinese *ʔak-s.

28 I represent Old Chinese in Middle Chinese transcription, the earliest stage of this language whose reconstruction is not controversial.

b. 既利之, 敢不識乎?
kjijH lijH tɕi kamX pjuw ɕik ɣu
since profit DEM dare NEG know QU
'Since I find advantage in that, how would I dare not know?'
(Zuozhuan, Zhao, 3, translation by Durrant et al. 2016)

Aside from Old Chinese, zero-marked estimative strategies are rare in the sample. Mwotlap (motl1237, Austronesian) has estimative conversion, but it is limited to kinship terms (François 2001: 726–729, 2004: 192–193), as shown by (36), where the noun *imam* 'father' is converted into a verb 'see/consider as a father'.

(36) Mwotlap
Ēntē-yō m-imam no.
son-3DU PRF-(see.as)father 1SG
'Their sons consider me as a father to them/call me father'.

5.2 Estimative strategies without estimative marker

Some indirect estimative strategies do not use any verb as ESTIMATIVE MARKER, but only mark the estimator with an oblique case marker. This type of strategy can be illustrated by Mwotlap, which uses the dative or the instrumental (37) to indicate the ESTIMATOR.

(37) Mwotlap (François 2021)
nē-dēw mi no
STAT-heavy COMIT 1SG
PARAM ESTIM.MRK ESTIMATOR
'It is heavy for me.'

A variant of this strategy is exemplified by Bardi (bard1255, Nyulnyulan), where the estimator is encoded as an oblique agreement word/clitic[29] (38), rather than as an adpositional phrase.

(38) Bardi
Arra gorna loogal=jamb jard.
NEG good bad=THUS 1PL.EXCL.OBLIQUE
'It's not good, it's thus bad, according to us.' (example provided by Claire Bowern, from the unpublished story 'Life at One Arm Point' by D. Wiggan, recorded by Gedda Aklif in 1990)

29 The paradigm of these clitics is described in Bowern (2012: 410).

6 Extended estimative constructions

This section deals with constructions that are either derived from estimatives by combining them with other constructions (including voice derivations or comparatives), or which are semantically close to, but distinct from estimative constructions as defined in Section 1.1.

6.1 Combinations with other derivations

Only two examples of estimative derivations combined with other derivations are found in the sample, in Japhug and Ojibwe.

In Japhug, verbs taking the estimative prefix *nɤ-* can be used as input for several valency-decreasing derivations, in particular the reciprocal *a-* (Jacques 2021b: 873–874), for instance *mpɕʏʁ* 'be beautiful' → *nɤ-mpɕʏʁ* 'consider to be beautiful' → *a-nɤ-mpɕɯ~mpɕʏʁ* 'consider each other to be beautiful'. Combination with the antipassive *sɤ-* is possible but borderline for pragmatic reasons (*sɤ-nɤ-mpɕʏʁ* 'consider people to be beautiful' is acceptable but almost never used). The estimative is however not compatible with the reflexive, and a distinct auto-estimative form is used (Section 2.3).

Ojibwe has two specific passive estimative final stems *-endaagozi* and *-endaagwad* 'be thought to be *X*' (Table 10, used with animate and inanimate subjects, respectively). These final stems can be further analyzed as comprising the stem *-end-*, the transitive final *-aw-*, the passive *-igw-* and the intransitive final stems *-izi* (animate subject) and *-ad* (inanimate subject), with regular vowel fusion *-aw-igw- → *-aagw-* and *-igw-izi → *-igozi-* (Valentine 2001: 357).

In addition, the transitive final stems *-enim* and *-endan* 'by thought' have a corresponding animate intransitive final *-endam*, which derives verbs whose intransitive subject is an experiencer/ESTIMATOR, without any overt ESTIMEE (compare

Table 10: Examples of passive and antipassive estimative verbs in Ojibwe.

	Animate S/O	Inanimate S/O
	mayag-izi	
	's/he is strange' (VAI)	
Estimative	*mayag-enim*	*mayag-endan*
	'think him/her strange' (VTA)	'think it strange' (VTI)
Passive	*mayag-endaag-ozi*	*mayag-endaagw-ad*
estimative	's/he is thought to be strange' (VAI)	'it is thought to be strange' (VII)
Antipassive	*mayag-endam*	
estimative	's/he feels strange' (VAI)	

mayag-endam 's/he feels strange' with *mayag-enim* 'think him/her strange' in Table 10).

6.2 Estimative comparative constructions

Adjectival estimative constructions can be combined with comparative and equative constructions, including in languages with derivational estimatives.

Estimative and comparative constructions share their PARAMETER, and the ESTIMEE of the former corresponds to the COMPAREE of the latter,[30] as illustrated by the following examples from Japhug.

In (39a), the COMPAREE is the intransitive subject (the 2SG is indexed on the verb *ɕqraʁ* 'be intelligent'), while in the corresponding estimative comparative (39b), the COMPAREE/ESTIMEE is indexed as the direct object.[31]

(39) Japhug

a. *nɤ-pi* *sɤz* *nɤʑo* *kɯ*
2SG.POSS-elder.sibling 2sg
STANDARD STD.MRK COMP COMP.MRK
ɲɯ-tɯ-ɕqraʁ.
SENS-2-be.intelligent
(TAM)-COMP-PARAM
'You are more intelligent than your elder brother/sister.'

b. *nɤ-pi* *sɤz* *nɤʑo* *kɯ*
2SG.POSS-elder.sibling 2SG
STANDARD STD.MRK COMP/ COMP.MRK
ESTIMEE
ɲɯ-ta-nɤ-ɕqraʁ.
SENS-1 → 2-ESTIM-be.intelligent
(TAME)-ESTIMATOR → COMP/ESTIMEE-ESTIM.MRK-PARAM
'I think that you are more intelligent than your elder brother/sister.'

Nominal estimative constructions, however, tend to resist combination with comparative constructions. In French for instance, deriving (40a) from (31d) is not grammatical. It is necessary to use a comparative adjective as a modifier of the noun to make it acceptable (40b).

30 I follow the terminological framework of Treis (2018).

31 In Japhug, the comparee marker *kɯ* historically derives from the ergative *kɯ* (Jacques 2016a). It marks the intransitive subject in (39a) and the object in (39b), which would be expected to be in the absolutive in non-comparative constructions.

(40) French
a. †*Je te considère comme plus un*
1SG.NOM 2SG.ACC consider:PRS:1SG as more INDEF.M.SG
ami que lui.
friend:SG STD.MRK 3M.SG
b. *Je te considère comme un*
1SG.NOM 2SG.ACC consider:PRS:1SG as INDEF.M.SG
meilleur ami que lui.
better:M.SG friend:SG STD.MRK 3M.SG
'I consider you to be a better friend than him.'

Data is lacking on estimative comparative constructions. They are sometimes mentioned in grammars (see for instance example (34), Peña 2015: 443), but the available data at present is too fragmentary to allow any systematic cross-linguistic study.

7 Typological generalizations

7.1 Hierarchy of senses

Verbs of perception are used in both incorporating (Section 2.2.5) and periphrastic (Section 3.3) estimative strategies in some languages. From the data available, it seems however that not all verbs of perception are equally frequent.

(41) GENERALIZATION 1: If a language uses one or several perception verbs in incorporating or periphrastic estimative strategies, then at least one of these verbs encodes vision.

Languages with an estimative strategy involving perception verbs either select the verb 'see' (Cavineña *-ba* 'see', Section 2.2.5), or use several perception verbs including 'see'. The idea of a hierarchy of the senses, and in particular the pre-eminence of vision, was proposed by Aristotle (Tastevin 1937), and is supported by many scholars, including Viberg (1984) in linguistic typology. While the validity of this hierarchy is disputed (Majid et al. 2018), no language exclusively using an auditory, tactile or olfactory perception verb in estimative strategies has been found up to now. If such a language were discovered, it would falsify the hypothesis of GENERALIZATION 1 as a conditional universal.[32]

32 A verb meaning 'feel by touch' can only be accepted as a counterexample to this generalization if it is *not* also used as a manipulation verb meaning 'grasp', 'catch' or 'hold'.

Two additional areas of research are relevant to testing this generalization. First, we could investigate the lexical sources of estimative markers when they involve verbs of perception (as in Algonquian). Second, the study of text corpora from languages using several perception verbs as estimative auxiliaries could reveal whether the perception verb of vision ('see') is always the most frequent one in estimative function.

7.2 Hierarchy of valency-changing derivations

Dedicated morphological estimative derivations are rare in the world's languages, notably in comparison to causative derivations.

The proximity between direct estimative derivations and causatives in terms of the syntactic function of the added argument (Section 2.2.1), and the fact that many languages use causative morphology with an estimative interpretation (Section 2.2.2) raises the question whether an implicational hierarchy might not exist between dedicated direct estimative derivations and causatives (42).

(42) GENERALIZATION 2: If a language has a dedicated morphological estimative, it also has a distinct dedicated morphological causative.

This generalization is verified in the small sample available; all ten languages in the sample with a dedicated direct estimative affix (Japhug, Siglitun, Lakota, Turkish, Ilocano, Nanai, Khalkha, Finnish, Northern Saami, Ojibwe), in addition to Sandawe (which can also potentially be analyzed as dedicated) also have at least one productive causative affix, some even more than one (Table 11).

Table 11: Dedicated direct estimative versus causative derivations.

Language	Estimative	Causative	Reference
Siglitun	*-gi*	*-tit-*, *-pkaq-*	Lowe (2001: 296)
Japhug	*nɤ(ɣ)-*	*sɯ(ɣ)-*, *z-*, *ɕɯ(ɣ)-* *ɕ-/ʑ-*, *j-*, *ɣɤ-*	Jacques (2021a: 819–859)
Lakota	*-la*, *-lakA*	*-yA*, *-khiyA*, instrumental prefixes	Ullrich (2008)
Turkish	*-(im)sA*, *-sIn*	*-t*, *-Ir*, *-Ar*, *-dIr*, *-lAt*	Göksel and Kerslake (2005: 57, 71)
Ojibwe	*-enim*/*-endan* perception finals	*-'*/*-toon*, *-iN*/*-inam*, instrumental finals	Valentine (2001: 433–457)
Ilocano	*tagi-* … *-en*	*pa-*	Rubino (2000: lxx)
Sandawe	*-m̥̊sé*	*-ku*, *-sí-ku*, *-se*	Eaton (2010: 64)
Nanai	*-si*	*-wān*/*-wēn*	Onenko (1980: 546)
Khalkha	*-šAA*	*-UUl*, *-g*, *-AA*	Janhunen (2010: 149)
Finnish	*-ksu*, *-ksi*	*-tta*, *-ahdutta*	Hakulinen (1961: 184; 187)
Northern Saami	*-ša*	*-hit*, *-ahttit*	Valijärvi and Kahn (2017: 253–254)

A similar generalization could be proposed between dedicated indirect estimates and indirect applicatives (as in Abaza and Cebuano), but examples are too few to be meaningful.

8 Conclusion

This survey of estimative constructions in the world's languages shows that estimative derivations, though uncommon, are attested in nearly thirty language families, of which eleven have at least one language with a dedicated marker. Some dedicated estimative derivations constitute a valency-increasing derivation distinct from causatives or applicatives, while in other cases they are a special subtype of applicative or denominal derivations. Non-dedicated estimative derivations also have causative, applicative, general denominal/deadjectival and desiderative functions.

Some estimative derivations are diachronically stable, as shown by their reconstructibility in at least four groups (Eskaleut, Algonquian, Saami and Gyalrong).

Periphrastic estimative and zero-marked estimative strategies are considerably more common than estimative derivations, and are attested even in languages with dedicated morphological estimatives. Many, if not most languages have several competing strategies with estimative interpretation.

This work provides a framework for fieldwork linguists, which could prove helpful to collect the relevant information in a systematic way in future documentation projects, even in languages lacking morphological estimative strategies. Data collected using this framework can serve in the future to devise a finer-grained typological survey of estimative strategies and test the generalizations proposed in this paper.

Abbreviations

ACT	actual
ANIM	animate
ASF	adjectival suffix
CO	conjunct order
COMP	comparee
CONV	converb
DEC	declarative
EMPH	emphatic
ESTIM	estimative
EUPH	euphonic
LIG	ligature
LNK	linker
MAL	malefactive

MRK	marker
NPF	dummy noun prefix
OBJ	object
PARAM	parameter
PCP	participle
PRF	perfect
PRS	present
REL	relativizer
SBJ	subject
STD	standard
TAME	tense-aspect-modality-evidentiality
VAI	intransitive animate verb
VII	intransitive inanimate verb
VTA	transitive animate verb
VTI	transitive inanimate verb

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