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Beyond argument structure: Determinants of handshape choice in classifier constructions

1. Introduction

Argument structure describes the relationship between a predicate and its arguments, including how many arguments an individual predicate licenses and what each argument's thematic and grammatical functions are. Take the English verb *accuse* in *Neville accused Justin of theft*: It licenses three arguments, an accuser (*Neville*), an accused (*Justin*), and the content of the accusation (*of theft*). For each argument, we can determine its grammatical relation to the verb (subject, direct object, prepositional object) as well as its semantic role (agent, patient, content (of the accusation)). In addition to such ditransitive verbs, languages typically have transitive verbs that license two arguments, and intransitive verbs that license only one argument. Some transitive verbs alternate between a transitive and an intransitive use, for instance English *melt* can license either one argument (*The butter melted*) or two (*Neville melted the butter*). This particular alternation is called causative-inchoative because the transitive variant features a causer subject (*Neville*) and a theme object (*the butter*), while the intransitive features only the theme as subject. Verbs that participate in the causative-inchoative alternation typically denote a change of state or location (Levin & Rappaport Hovav 1994). In English, verbs that have more than one argument-structure realization occur in the same morphological form, but in many other languages the alternation is flagged morpho-syntactically. The marker may be borne either by the causative verb, e.g. in Khalka Mongolian *ongoj-lg-ox* 'open (tr.)' vs. *ongoj-x* 'open (intr.)', or by the inchoative verb, e.g. in Polish *zlamać-się* 'break (intr.)' vs. *zlamać* 'break (tr.)', or both variants bear a marker, e.g. Japanese *atam-aru* 'gather (intr.)' vs. *atam-eru* 'gather (tr.)' (Schäfer 2009). Such overt marking of the argument realization needs of the predicate forms the focus of the present paper. Specifically, we look at a subclass of predicates attested in most documented sign languages, classifier predicates¹, and show that the choice of classifier (handshape) in these predicates does not strictly align with their argument structure. We propose that there are a variety of motivations beyond argument structure that influence classifier choice.

In the following, we look at claims in the literature regarding the relation of classifier predicates to argument structure. Here and throughout the rest of this paper, we enrich the discussion with examples from three different types of sources. Two of these sources are commonly used by linguists to make points, namely sentences elicited from signers and online corpora of everyday signing and narratives. The narratives are drawn from the RISE videobooks,² where native signers of different sign languages tell stories that were presented

¹ We use the term 'classifier predicate' as a theory-neutral descriptor for a phenomenon that has received many names over the years, including *classifier verbs or predicates* (Supalla 1986, Schick 1987), *depicting verbs* (Liddell 2003), *poly-morphemic verbs* (Engberg-Pedersen 1993), and *poly-componential signs* (Slobin et al. 2000).

² <https://risevideobooks.org/>

to them in the text of the ambient spoken language. The signers were asked to read and think about the story, then put it aside and simply sign as though there is an audience watching them. The co-directors of RISE have never received comments criticizing the signing; to the contrary, all comments about the signing have been positive. This allows us to assure you of the naturalness of the signing of individual sentences.

In a third kind of example, we present scenes from poetry created by deaf people in a sign language. Poetic language in either modality feels special – distinct from ordinary conversation – and so some might propose that sign literature moves outside of the confines of grammar. As “poetry of the body” (Sutton-Spence & de Machado 2020: 322) it may be perceived as more akin to mime. Sutton-Spence and Boyes Braem (2013), however, show that the characteristics of sign literature differ from mime in ways we would expect if poetic language does indeed conform to the grammar. Further, non-signers do not understand sign literature (Sutton-Spence & Quadros 2014), whereas they do understand mime. The language poems are delivered in, whether in speech or sign, is understood as poetic, rather than broken or deviant. Roman Jakobson says about spoken language that grammatical concepts “find their widest applications in poetry as the most formalized manifestation of language” (Jakobson 1985, p. 39). Macarthur (2025) sums up the relationship between poetry and ordinary language as follows: “...ordinary language is not something stable and fixed, but a complex flux of the creative use we make of ordinary words in specific contexts ...”. We would extend that to include the creative use of syntax as well (e.g. *Happy am I*). To us these observations and discussions warrant including examples from sign poetry in our study.

Commented [CL1]: page number?

Commented [DN2R1]: It's online – so how do we note page? It's page 2 of a 3-page introduction – found here – <https://www.mdpi.com/2409-9287/10/2/28#:~:text=ordinary%20language%20is%20not%20something%20stable%20and,ordinary%20words%20in%20specific%20contexts%20in%20second%20download%20and%20send%20it%20to%20you>

2. Previous generalizations about correlations in classifier handshape and argument structure

2.1 Classifier predicates and classifier types

Classifier predicates (CLPs) form a subset of the predicational system of sign languages and depict the movement, location, or manipulation of an entity (Zwitserslood 2012). In contrast to lexical verbs, every formational component of CLPs carries meaning. In Figure 1, for example, a signer of German SL depicts a boy falling off a deer's head. The signer's handshape (the *classifier* – a term coined by Frishberg 1975) classifies the falling object as bipedal, the initial location of the sign marks the starting point of the fall and its final location the endpoint, the hand's movement can indicate not only the shape but also the dynamics of the falling movement, and the orientation of the palm shows that the boy is falling head-first.



German SL

https://www.sign-lang.uni-hamburg.de/meinedgs/html/1180026_de.html#t_00000921

Figure 1. CLP depicting a person falling off a deer's head

Classifiers come in different types and are distinguished by how they depict an entity: In (whole) entity classifiers, the handshape indexes a referent in its entirety, either via one of its semantic features (e.g. animacy, means of transportation) or by a form feature (e.g. size, shape). The thumb-up Z-classifier for vehicles in American SL is an example of a semantic entity classifier, the /-classifier that represents round 3D objects such as apples or balls in many sign languages is an example of a shape-based entity classifier (SASSs in Supalla 1982).

A second group of classifiers that could theoretically be subsumed under entity classifiers are body-part classifiers, where the hand(s) stand in for a human or animal body part (Supalla 1986) such as wings, paws, legs, or beaks. In contrast to other entity classifiers, body-part classifiers are often positioned near the real-world location of their referent on the human body (i.e., the referent's body is mapped onto the signer's body, part for part). They often trigger constructed action (CA), i.e. the signer's body as a whole takes on the role of the entity possessing the body-part (Supalla 1992; Benedicto & Brentari 2004). Figure 2A shows a still from the American SL poem "Caterpillar" by Ian Sanborn exemplifying CA: the signer takes on the role of a butterfly looking down onto the earth; his hands form body-part classifiers that depict the butterfly's wings. Figure 2B from French SL shows a mouse walking away jauntily from a lion; the signer takes on the role of the mouse and the B-handshape of her right hand is a body-part classifier for the mouse's tail.



A. American SL

<https://www.youtube.com/watch?v=4PeYpRbg18Y&t=163s> [2:40]



B. French SL

<https://www.youtube.com/watch?v=M17YP4qIS18&list=PLz551fY8YMLjTJdiTeCUVILozCeKbdWr3&index=1> [1:39]

Figure 2. Example of CA plus a body-part classifier from American SL and French SL

The third group of classifiers of interest to us are handling classifiers, where the handshape groups objects by how they are manipulated by an entity, typically by a hand. Long thin objects like sticks or pens are held differently from compact, e.g. rectangular objects, and are thus represented by different handling classifiers (typically O vs. <) (Zwitserlood 2003). Figure 3 shows a handling classifier in Italian SL where the handshape is appropriate to how a human hand would manipulate a thin book.



LIBRO 'book' CL(O):take.thin.object

(Io) prendo un libro sottile (dallo scaffale). '(I) take a thin book (from the shelf).'

Italian SL

Figure 3: Handling classifier for thin objects (from Branchini & Mantovan 2022: 505)

Like body-part classifiers, examples of handling classifiers that co-occur with CA abound. In these instances, the agent is shown both in the handling classifier and in the CA. For example, in a Libras telling of a story in which a cat destroys a dog's rubber hamburger by chewing on it until it is full of holes, CA shows the cat chewing on the hamburger, which is represented by handling classifiers on both hands (Figure 4).



Libras

<https://www.youtube.com/watch?v=EEMs7URaM8k&list=PLz551fY8YMLhaRt085fT5LdxRNSc3ENki&index=3> [6:13-6:14]

Figure 4: handling classifiers, agent shown by CA

Psycholinguistic evidence suggests that CLPs consist of both linguistic and gestural components, although debates over the proper analysis of CLPs are ongoing (Beukeleers & Vermeerbergen 2022 give an overview of the literature). Classifier handshapes are located closer to the linguistic end of the spectrum in that they are language-specific (e.g., HKSL frequently uses a vertical f-handshape to represent humans where DGS uses B or the inverted Y), they are acquired later than other components of CLPs, and they are interpreted categorically (see Zwitserlood 2021 for experimental work on CLPs). Movements and locations, on the other hand, seem to be located on the gestural end of the spectrum; signers of different sign languages as well as silent gesturers produce similar movements and locations to describe the same events (Schembri et al. 2005).

2.2 Previous claims about the typical relationship between argument structure and classifiers in CLPs

The strongest claim about the relationship between classifier choice and argument structure in CLPs is formulated in Benedicto and Brentari (2004),³ who look at ASL and claim that classifiers are syntactic heads that determine whether an argument of a CLP is external (roughly, agentive) or internal (patient- or theme-like). The authors argue that entity classifiers project a syntactic head in whose specifier sits an internal, patient-like argument, and body-part classifiers project a head in whose specifier sits an external, patient-like argument. Handling classifiers are claimed to be morphologically complex and to consist of a handpart (or rather, the palm's orientation towards a relevant spatial plane) and a set of selected fingers. The selected fingers project the head associated with the internal argument while the handpart projects the head whose specifier hosts the external argument. To bring it down to earth, a handling classifier like O indexes its internal argument, the object held, via the selected fingers (because if I held an object of a different, say bulkier, shape, I would select all fingers instead of only the index and thumb). At the same time, it indexes its external argument, the agent holding the thin object, via the palm, because the orientation of the palm changes depending on how I hold the object. If I'm holding a rose to drop it, say, onto a grave, my palm would face downward, while it would face contralaterally when giving someone a rose. In Benedicto and Brentari's account then, entity classifiers create intransitive CLPs and handling classifiers transitive CLPs.

Similar dependencies between classifier choice and argument structure of CLPs have been claimed to hold for LSA and LSC (Benedicto et al. 2007), for Auslan (Ferrara 2012), for LIS, HKSL and BSL (Brentari et al. 2015), for SZJ (Slovenian SL, Pavlič 2016), for NGT (de Lint 2018), for RSL (Kimmelman et al. 2019), and most recently for TİD (Gökgöz 2024). More

³ Their work is inspired by an earlier claim in Kegl (1990), who first described this phenomenon as a causative-inchoative alternation, where the entity handshape of the inchoative is replaced by the handling classifier of the causative.

generally, an association between handling handshapes and the presence of agency has been observed in child and adult homesigners as well as in emerging sign languages (see Rissman et al. 2020 for an overview).

Empirical evidence for an association between handling vs. entity classifiers and the transitivity of the CLP in which they are embedded comes from Kimmelman and colleagues (2019). The authors look at corpora of Canary Row retellings from Kata Kolok and RSL, NGT, and DGS, and find that entity classifiers are mostly used in intransitive CLPs and handling classifiers mostly in transitive CLPs. They do, however, note exceptions, which we discuss in Section 4.

3. Theoretical inadequacy of assuming a strict dependency relation between classifier and argument structure

We see two theoretical problems with assuming a strict dependency relation between classifier and argument structure: a potential for circularity and non-explanatoriness. We leave discussion of empirical problems for that dependency relation to Section 4.

If classifier type determines which arguments a CLP will take, the different types of classifiers should be differentiable via clear-cut and non-overlapping criteria. However, as Benedicto and Brentari (2004) note, body parts other than the hands can sometimes be used to handle an object - for instance, a beak or a toe might grasp an object. At other times, these same body parts perform a movement or are being located somewhere and thus more closely resemble entity classifiers. Importantly, the same classifier handshape may be used to depict the body part in both movement/location and handling events, and thus in transitive and intransitive frames. Classifier types lose their explanatory power if, for instance, body-part classifiers are re-classified as handling whenever they occur in transitive grasping/manipulating frames. However, this is what Benedicto and Brentari propose to do with body parts “that can manipulate objects” (2004: 750).

For example, in Figure 5A we see images from a story in which a child goes to the beach. In the ASL image, the child’s toes wiggle through the sand. In the NSL (Nigerian SL) image, the child’s feet tentatively touch the sand, experiencing how it feels. Are those hands body-part classifiers that indicate only toe/foot movement, or are they handling classifiers that indicate the toes/feet interacting with the sand – a transitive event?

Another example of a body-part classifier being used to encode a transitive event is seen in Figure 5B from ISL (Israeli SL). Here a father kisses his son. CA supplies the agent, and the right hand is a body-part classifier for the mouth. The patient receiving the kiss is not encoded overtly, yet kissing is a transitive event.

A. toes wiggling in the sand/feet pressing the sand downward as they step lightly

	
ASL	NSL
https://www.youtube.com/watch?v=ELmilAbnam0 , [1:17]	https://www.youtube.com/watch?v=aNZOMMDDR5o , [1:26]
B. lips kissing	
	
ISL	
https://www.youtube.com/watch?v=CF16LrXEh64&list=PLz551fY8YMLg-6sUqtns_wFXr-UPAymUc&t=302s [5:01]	

Figure 5: Body-part classifiers in transitive frame

Gökgöz (2024) seemingly circumvents the circularity built into Benedicto and Brentari (2004) by assuming that classifier types are not syntactic primitives but are made up of morpho-phonologically active parts. In his view, selected fingers and joint configurations index the internal argument regardless of classifier type, while the handparts that interact with a manipulated object index the external argument. Despite these adjustments to the theory, the question remains why body-part and handling classifiers can have such morpho-phonologically active handparts but a) entity classifiers cannot, and b) they are only active in body-part classifiers when these depict a transitive event. What's missing is attention to the depicted event, and therein lies a major inadequacy: such a theory is non-explanatory.

Further, Gökgöz' assumption that selected fingers and joint configurations can classify internal arguments in all types of transitive events is problematic. His theory encompasses both grasping and contacting events, where the latter includes pushing events. In pushing events, however, the hands typically assume an open shape, the fingers are all extended and often spread. Now, any kind of object - from people to vehicles to boxes to abstract objects (e.g. unpleasant ideas) - may be pushed using that handshape, so it is not clear how the five selected extended fingers can index different types of internal arguments. The same is true of other body parts that can manipulate an object but cannot indicate the object's size or shape. Gökgöz

mentions a >-hand depicting a cat's mouth biting into something, where it is doubtful that the handshape for the mouth would be adjusted to reflect different objects being bitten.

Such theoretical inadequacies in conjunction with empirical inadequacy attested across genetically unrelated sign languages demand modifying argument-structure-based theoretical approaches.

4. Empirical inadequacy of strict dependency between classifier and argument structure

4.1 Mismatches between argument structure and classifier choice

In lexical signs based on CLPs, associations between handling/entity classifiers and argument structure are often not active. Engberg-Pedersen (2010), for instance, notes that in DTS (Danish SL), BRÆKKE 'break' features handling classifiers on both hands depicting how an object is broken into two parts, but the sign can be used intransitively with an internal argument. For productive CLPs, even studies that adopt a dependency relation between classifier and argument structure note mismatches between classifier choice and argument structure, but those are claimed to be unidirectional. According to Kimmelman and colleagues (2019) and He (2020), handling classifiers in Kata Kolok and RSL, NGT, DGS, HKSL, Beijing SL, and Tianjin SL always occur in transitive frames, while entity classifiers may occur in both intransitive and transitive frames. Here we show that not only may entity, body-part, and SASS classifiers SASSs be used in transitive frames, but handling classifiers may also occur in intransitive CLPs.

Commented [DN3]: Or maybe "not realized" ?

4.1.1 Entity classifiers

Kimmelman and colleagues (2019) find that between one and nine per cent of entity classifiers per language in their study are used in transitive frames. In (1), we see clearly transitive sentences in RSL and Tianjin SL that contain a CLP with an entity classifier.

- (1) a. IX_A GRANNY, IX_A DOOR IX_B WINDOW, WINDOW CL(x):open
'The granny opened the window which was on the top of the door.'
(RSL, Kimmelman et al. 2019a: 342)
- b. TABLE_A SMALL KNIFE CL(S):be.located_A. BOY CL(S):turn.over
'The small knife is located on the table. The boy turns it over.'
(Tianjin SL, He 2020: 149)

Another example from our own data is shown in Figure 6 from ZEI (Iranian SL). Here a friend draws a picture for another friend. He draws with his right hand on his left hand, which

depicts the canvas (an entity classifier). Then he turns his left hand and extends it forward for others to see. The transitive event of showing the picture is encoded via an entity rather than a handling classifier; the x-hand simply isn't how you hold a picture.



Figure 6: ZEI: Showing a picture to a friend

<https://www.youtube.com/watch?v=E7lQ1HIxSOI> [4:04-4:06]

In LIS (Italian SL), an entity classifier can be used in a CLP describing how someone hangs a key on a wall. In Figure 7, the signer signs IX KEY CL(D):hang_onto_hook, where the movement of the CLP denotes an agent's movement of the key onto the hook, but the handshape represents the key (ring).



Figure 7: LIS: Hanging a key onto a hook on the wall

4.1.2 Body-part classifiers

Similar to our examples in Figure 5, Grose and colleagues (2007) show that body-part classifiers, too, can occur in transitive frames in ASL. In (2) the classifier indexes the internal argument, the head that bows, while the external argument COW is not referenced on the classifier.

(2) COW CL(i):horned-head.bows

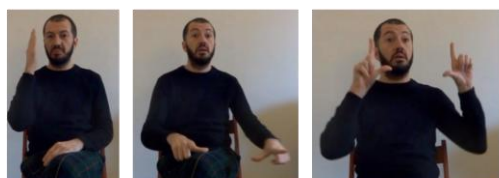
‘The cow bowed its head.’

(ASL, adapted from Grose et al. 2007: 1275)

Such constructions also occur in HKSL, RSL, Beijing, and Tianjin SLs (He 2020; Kimmelman et al. 2020). Kimmelman and colleagues (2020) argue that in transitive CLPs with entity and body-part classifiers, the external argument is merged in a higher verbal projection such as vP or VoiceP and does not have to be licensed by a handling classifier. As Kimmelman and colleagues (2019) note, however, such an analysis overgenerates, since entity classifiers in the four typologically diverse sign languages they investigate predominantly occur in intransitive frames.

4.1.3 SASSs

Lastly, size-and-shape specifiers (SASSs) that outline the form of an entity may occur in transitive frames as well, as illustrated in [Figure 8](#) from LIS.



MIRROR CL(C): 'pick_up_square_mirror'

'(The woman) picks up the square mirror.'

(LIS, Fornasieri 2022: 452)

[Figure 8](#): SASS classifier used transitively

Fornasieri (2022) states that [Figure 8](#) features a handling classifier, although the same form can function as an SASS in a static predicate of location. To us, this repeats the circular reasoning we saw in Benedicto and Brentari (2004): If a classifier is describing a shape, it's an SASS; if that same classifier is involved in a meaningful movement, it's categorized as handling. But we don't typically handle a mirror in the way depicted in [Figure 8](#), hence we conclude that the C-classifier here is an SASS used transitively.

4.1.4 Handling classifiers

Turning now to handling classifiers in intransitive predicates, recall that both the theoretical and empirical literature predicts that this combination should not occur. Handling classifiers are claimed to occur only in transitive frames. However, one can concoct situations in which handling classifiers introduced in a transitive frame then continue to be used in an intransitive

frame. For example, we elicited the following event description from an ASL signer: *I found an injured bird. It couldn't move at all. I put it on the table, but it fell off.* The key events of placing the bird on the table followed by it falling off are shown in **Figure 9**. The person picks up the bird and places it on a table using a handling classifier. They then turn away and as they look back, they see the bird falling from the table. The intransitive act of the bird's falling is represented by the same handling classifier used for holding the bird; it persists throughout the event description in depicting the bird.



Figure 9: ASL: Handling classifier depicting how a bird is picked up (transitive) and then falls (intransitive)

A second example comes from a DGS story about a man collecting pears. As **Figure 10** illustrates, the signer first introduces the pears via a lexical sign (a) and an entity classifier with contralateral palm orientation (b). He then describes how the man climbs into the tree and plucks the pears, using the handling classifier in (c). In one instance, a pear falls down after having been plucked (d), for which the same classifier is used as for the plucking event. One might argue that entity and handling classifier are barely distinguishable here, and while they don't differ in handshape, they do differ in orientation (compare (b) and (c)). In (d), it seems that the transitive variant with palm-up orientation is selected to show the intransitive event of the pear falling.

Commented [DN4]: Are you sure? I thought he didn't pluck it – he just heard it fall – so I'd say "a pear falls down on its own" ??

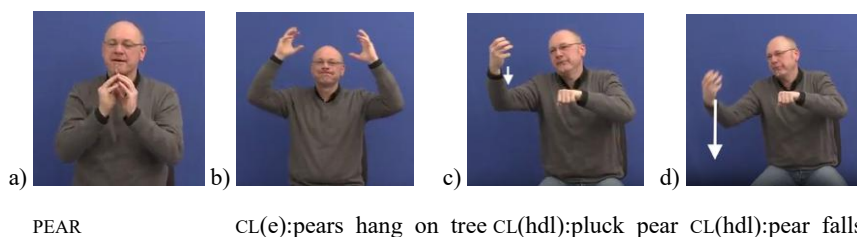


Figure 10: DGS: Handling classifier depicts how a pear is picked (transitive) and then falls (intransitive)

https://www.sign-lang.uni-hamburg.de/meinedgs/html/1177640_en.html#t00003421

Intransitive uses of handling classifiers are difficult to account for in a theory that treats handling classifiers as necessarily introducing an external argument. Note the contrast to entity classifiers used in a transitive frame, where the missing external argument can be introduced by a higher syntactic head. In order to use handling classifiers intransitively, their external argument would need to be deleted or rendered inactive.

4.2 Encoding arguments via constructed action

Another approach to accounting for the use of entity and body-part classifiers in transitive frames relies on the contribution of nonmanual articulations. In Section 2.1, we noted that body-part classifiers often feature constructed action such that the signer's body depicts the mental state and/or movements of the external argument while the hand(s) depict the internal argument. We can clearly see CA in the facial expressions of the signers in Figures 2 and 5 earlier. Similar use of constructed action to portray the external argument is found with entity classifiers. He (2020) notices that entity classifiers in transitive frames may be accompanied by CA of one of the lexically present arguments in HKSL, Beijing and Tianjin SLs. CA can represent either the external or the internal argument: In (3a), the entity classifier indexes the patient BOOK while CA represents the agent of the opening event. In (3b), the patient negatively affected by the falling event of the book is represented by CA.

top

- (3) a. BOOK BOY CL(e):open book CA: boy (agent)
'A boy opens the book.'
b. MOUSE RUN // BOOK CL(e):book falls onto mouse CA: mouse (patient)
'The book falls onto the mouse.'
(HKSL, He 2020: 197-198)

Gökgöz (2024) offers a similar example from TĪD in (4). He suggests that only the mouth action here identifies the external argument MOUSE, but we see no reason to single out the mouth. Rather, CA more generally is at play: The entire facial non-manuals index the mouse's mental state as it moves the needle, depicted via an entity classifier.

CA: br, we, stretched lips, teeth showing

- (4) MALE MOUSE LOOK-AT_B, NEEDLE CL(B):stick.
'The male mouse looks at (the cat). (The mouse) sticks the needle down.'
(TĪD, Gökgöz 2024: 201)

Constructed action often adds an agent to an entity or body-part classifier to depict a transitive event. **Figure 11** gives an example from the BSL poem ‘Tree’. Paul Scott depicts a man carrying a ladder and leaning it against a tree. Throughout, the ladder is indicated by the S-handshape, an entity classifier, and the agent is present only via CA (the lips pressed together tightly, the man’s gaze up the tree).



BSL

<https://www.youtube.com/watch?v=TaQIdovqsFg> [1:19-1:20]

Figure 11: Entity classifiers on manuals, agent shown by CA

While there is no denying the contribution of CA to understanding the argument structure of examples like those in (3-4) and Figures 4-10, a theory that proposes a dependency relation between classifier and argument structure must explain how the information conveyed by CA should be integrated during the derivation.

4.3 Bimanual encoding of transitivity

In addition to arguments that are nonmanually articulated via CA, arguments may also be indexed on the nondominant hand. With the exception of He (2020), research on the relationship between classifier choice and argument structure has ignored the role of the nondominant hand in contributing to the argument structure of the predicate complex. However, take a look at example (5) from Tianjin SL: The signer depicts a transitive event of a boy knocking into a girl where both agent and patient are depicted via entity classifiers on the dominant and nondominant hands, respectively. Following Benedicto and Brentari (2004), an entity classifier should not confer an agent role to the argument in its specifier, yet in (5) we are clearly dealing with volitional running and, hence, an agent. Nor does their theory of a strict dependency relation between classifier and argument take into account the fact that the nondominant hand indexes the patient argument in this complex CLP.

- (5) DH: GIRL_i CL(&);be.located_a // BOY_j RUN CL(&);run.towards CL(&);knock.into
 NDH: CL(&);be.located_a-----
 DH:

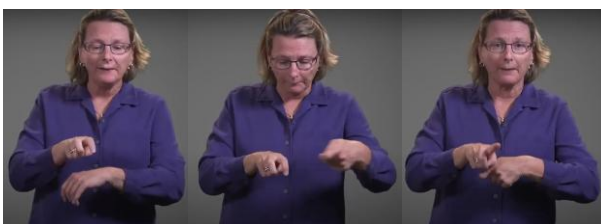
NDH: CL(&):fall.down

‘A girl is located here; a boy runs towards her and knocks her down.’

(Tianjin SL, adapted from He 2020:154)

The dearth of discussion of such bimanual classifier constructions may be partially due to the unsettled debate about their status as one vs. two (simultaneous) CLP(s). Zwitterlood (2003) argues that, at least in verbs of movement and location, the dominant and non-dominant hand form independent morphosyntactic units. Only if this is true of verbs of manipulation and handling as well does it make sense to determine the influence of each CLP on the argument structure of the clause separately. However, in many bimanual CLPs the two classifiers are not independent from each other morphosyntactically. Indeed, in some CLPs, the movement of one entity is depicted via articulations of both hands. To show a boy falling off a deer’s antlers, for instance, the signer may move the hand encoding the boy down while simultaneously moving the hand representing the antlers upward to show a longer movement trajectory (Loos & Napoli accepted). In other CLPs, one classifier acts upon the other in a way that causes the latter to change shape (as when two cars collide, and one or both crumple from the impact). The interaction between the referents designated by each classifier is relevant to the choice(s) of classifiers and to how those classifiers change or move.

For example, consider [Figure 12](#). Here a signer explains in ASL how the patellar reflex is tested. Her right hand is an entity or body-part classifier for a person sitting on the end of an examination table – the patient in both the medical and the grammatical sense. The left hand is a handling classifier depicting the doctor holding a hammer. The left hand knocks the right hand (on the bent part of the index finger) and the right hand instantaneously changes shape (the index finger extends) to show the reflex action of the knee straightening. The arguments in this transitive frame are encoded on both hands simultaneously: The handling classifier encodes the agent (and, arguably, the instrument), and the body-part/entity classifier encodes the patient of the knocking event. The morphology (shape) of the body-part/entity classifier is affected by the action of the handling classifier.



ASL

<https://www.youtube.com/watch?v=JAN2IWfCw7A> [4:35-4:36]

Figure 12: patient’s knee is knocked with a hammer to test reflexes – bimanual classifiers

5. Discussion: Classifier choice beyond argument structure

We have seen theoretical (Section 3) and empirical (Section 4) inadequacies of theories claiming that classifiers determine argument structure. So how do classifiers relate to argument structure? If there's anything the state of literature on word order in signed sentences has taught us, it is that the grammars of sign languages are intricately connected to event and information structure (Gan 2025 offers an overview of the literature on information structure and word order). In a truly explanatory theory of CLPs, the role of handshapes should, likewise, be determined based on needs of the event one wants to depict and its participants, rather than on a property intrinsic to the classifier or its subparts. Thus, whether we are describing a toe simply wiggling or, instead, a toe grasping a pebble should be the crucial factor affecting classifier choice. In other words, the determining factor lies outside of the classifier itself. We now go through what the needs of an event might be and how CLPs connect to those needs.

One reason why signers of different sign languages sometimes choose an entity classifier in an otherwise transitive frame may be that classifier choice allows them to highlight the patient and the change of state it undergoes (or the result of that change), while at the same time backgrounding the agent. Following Rissman and colleagues (2020), we consider any linguistic construction that orients the depiction of a transitive event away from the agent as agent backgrounding. Aside from syntactic passives, which to our knowledge have not been attested in documented sign languages, a range of linguistic devices can direct attention away from the agent (for overviews of the literature, see Barberà & Cabredo-Hofherr 2017 and Rissman et al. 2020). Given the availability of pro- and topic drop in many documented sign languages, the agent may simply be omitted or alternatively, a semantically empty locus may be chosen for the pronominal subjects (i.e., agents) or subject agreement. Additionally, the signer may take on the role of the argument undergoing the verbal action, thus lending prominence to the patient.

In the realm of CLPs, agent backgrounding has been associated with the use of entity classifiers. Benedicto and Brentari (2004) liken some CLPs to passive constructions, such as (6a), where an entity classifier indexes an instrument rather than the instrument wielder. In a footnote, they state that (6a), which contains an explicit agent licensing the adverb WILLING is sometimes acceptable in ASL. Likewise, Barberà and Cabredo-Hofherr (2017) note for LSC that CLPs signed in a high locus and thus agreeing with an indefinite, non-specific subject, can feature an entity classifier, as in (6b). De Lint (2018) shows that in NGT, too, entity classifiers are chosen to depict scenarios in which the agent is backgrounded (in her scenarios, the agent is either fully or only partially visible).

(6) a. CL(x):saw.wood WILLING

'The wood is cut voluntarily.'

(ASL, adapted from Benedicto & Brentari 2004: 774)

b. TRAY_{upCL(e)};turn.over WANT

‘They turned over the tray on purpose.’

(LSC, Barberà & Cabredo-Hofherr 2017: 782)

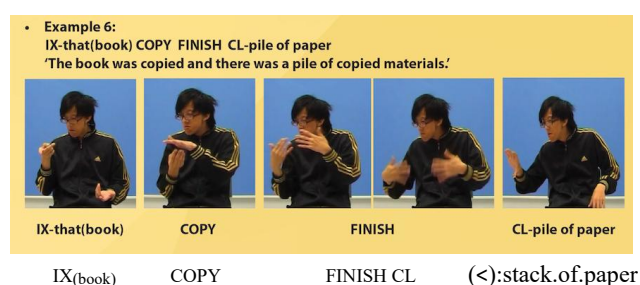
More generally, it has been shown that in emerging sign languages, entity handshapes may be used in both agentive and non-agentive contexts (Brentari et al. 2015, Goldin-Meadow et al. 2015). As many of the works cited in Section 2.2 do, these works adhere to the claim that handling handshapes are used exclusively in agentive contexts, so, quite naturally for them, their observation about entity handshapes connects to the notion of agent backgrounding.

For ISN (Nicaraguan SL), Rissman and colleagues (2020) show that second and third cohort users of the language employ significantly more non-handling handshapes than handling handshapes when the agent of an event is backgrounded (in their stimuli, agent-backgrounding vignettes showed only the agent’s hand as opposed to their whole body). Note that in the examples discussed so far in this section, the syntactic frame is transitive but the agent subject remains implicit and or is only encoded via agreement on the verb. However, in the examples we have offered of entity classifiers in transitive frames, the agent acting upon those entity classifiers is explicit, introduced via a lexical sign (as in (3a)) or CA (as in Figures 4, 5, 8), or via another classifier on the second hand (as in Figure 12). Such examples underscore the fact that the agent is, indeed, present in the syntactic frame, and suggest that entity classifiers in transitive frames may not primarily background the agent but, instead, may lend additional prominence to the patient or to the event components primarily associated with the patient, namely a change of state or a particular result state. For example, in Figure 11, the presence of the ladder allows someone to climb a tree to get a cat down. That someone carried that ladder is just by the way – a necessity of the fact that ladders can’t move on their own. The entity classifier puts the attention on the ladder itself, rather than on the carrier of the ladder.

This patient-oriented perspective may be triggered by a variety of factors, from the unknown identity of the agent, to the atypicality of the patient, to a focus on the result state of the action. Hakgüder (2021) notes that the more atypical an object is, the more likely it is to be referenced via an entity classifier in a transitive CLP. For instance, objects that are used as instruments in atypical ways trigger entity-classifier depiction more often than when the same objects are simply manipulated (as either typical instruments or as patients). He gives the example of a knife used to tighten a loose screw, and of a teaspoon cutting cheese. Hakgüder offers a psychological account for this observed entity-classifier preference in terms of perceptual salience. Event participants that stand out in a scene, for instance because they are used in unexpected ways, are likely to be encoded directly via an entity classifier rather than indirectly via their handling. Likewise, performing an unexpected action with an object such as putting a book on one’s head increases the chance that the action will be depicted with an entity classifier (Brentari et al. 2016). The impact of perceptual salience on classifier choice seems to be language-specific: Hakgüder notes that HKSL and TID are more sensitive to it than ASL, where they claim classifier choice to be more strictly aligned with transitivity.

Commented [DN5]: Yes?

A patient that is used in an unusual way or placed in an unexpected location may also trigger a focus on the result of the action. Sze (2010) notes that agent-backgrounding constructions in HKSL are often accompanied by resultative or completive markers such as FINISH or ALL-DONE, highlighting the end state of the action. Even where a verb does not entail an end state, signers tend to add one. In Figure 13, the verb COPY does not entail a result state, but the signer adds a CLP indicating the resulting stack of papers.⁴



'The book was copied and there was a stack of copied materials.' (Sze 2010, poster)

Figure 13. Agent-backgrounding constructions in HKSL with added result predicate

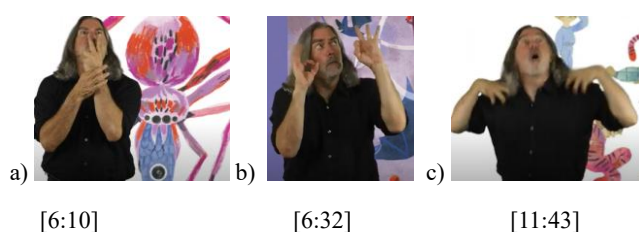
In an experiment involving ASL and ISN, signers presented with vignettes featuring an agent manipulating an object would frequently produce a handling CLP followed by an entity CLP showing the end-state of the action (Goldin-Meadow et al. 2015). Additionally, example (5) from Tianjin SL also features a transitive CLP with two entity classifiers followed by an intransitive CLP depicting the end result of the knocking-into event. To sum up, highlighting the end state of an action frequently correlates with the use of entity classifiers in transitive frames.

The present approach accounts for instances of entity classifiers in transitive frames in a way more closely aligned to the fact that the prominence of the referent in the depicted event is maintained. Repeatedly, we find entity or body-part classifiers in transitive events in which CA plays a role, clarifying whether the classifiers are agents or patients, sometimes by reinforcing the referents of the classifiers and sometimes by introducing new referents. Peter Cook's ASL rendition of a story about the food chain yields many such examples, where we offer a snap of three of them in Figure 14.

In Figure 14a, the hands are entity classifiers for goby fish, which flutter as they are swallowed, all the way down the throat of a spider which is shown by CA. These entity classifiers encode patients, while CA introduces the agent of the swallowing event. Here the entity being eaten is highlighted, and the use of an entity classifier allows the storyteller to show the gruesome image of the death throes of the goby fish – something sure to interest the

⁴ The example provided here uses a lexical verb, but the same agent-dropping construction is used for CLPs.

child who's trying to understand the brutal reality of the food chain. In **Figure 14b**, the hands are body-part classifiers for the eyes of the spider which, at this instant, spy a bat; so these body-part classifiers are agents (in line with claims about classifiers and arguments), confirmed by that agentive CA. In **Figure 14c**, children are pretending to be tigers as they jump on their father, a transitive event. The hands are body-part classifiers for the claws of the tiger/children and CA gives us the father; these body-part classifiers are agents, while CA introduces the patient argument. But notice that here, as in **Figure 14a**, having the claws be highlighted allows the child, who is identifying with those claws, to feel the excitement of a situation in which they, for once, overpower their father.



[6:10]

[6:32]

[11:43]

ASL "As Night Falls" (Peter Cook)

<https://www.youtube.com/watch?v=9f5BRjh9Y80>

Figure 14. CA clarifies the role of the entity or body-part classifier in a transitive event

Not only does this approach account for instances of entity classifiers in transitive frames in a way more closely aligned to the fact that the prominence of the referent in the depicted event is maintained, it is equally explanatory for the much less frequent instances of handling classifiers in intransitive frames. Looking back at **Figure 9**, we see that the handling classifier used to show where the injured bird is placed does not change to an entity classifier when the bird falls. By maintaining the handling classifier in this intransitive event, all agency is removed from the bird. That is, the signer is highlighting the bird's inability to move. Thus, the bird's unagentive fall is appropriately highlighted in an intransitive frame.

Classifier choice may also serve information-structural purposes, such as reference tracking. Choosing to maintain a handling classifier from a transitive through an intransitive event description facilitates reference tracking. It has been shown elsewhere that DGS signers prefer to use the same type of referential expression for the same referent (e.g. an NP followed by an NP, or a classifier followed by a classifier, Otte 2025). The Pear Story example in **Figure 10** is an example of the consistent use of the same classifier handshape regardless of event transitivity: it is used for pears being plucked, placed in a basket, falling, being picked up again. We have thus seen two cases in which a maintained referent is represented by the same (handling classifier), but what happens when other referents intervene and the signer has to re-introduce a certain referent? We asked the signer in **Figure 9** to produce the story about the injured bird a second time, but this time with one event intervening between placing the injured

bird on the table and it falling off, namely the narrator's sister coming in. In that scenario, the signer uses a handling classifier to place the bird on a table, then comments on the sister's appearance, and then re-introduces the bird with a lexical sign followed by an entity CLP for the bird falling. It is thus possible that using the same classifier through transitive and intransitive events is possible only for maintained referents.⁵

6. Some conclusions and a (more nearly) adequate theory

At this point we recall Dwight Bolinger's famous admonition (in classes and in public presentations – which one of the authors of this paper attended) that linguists should be careful not to let the tail wag the dog. The tail in this warning was theory. The dog in this warning was natural language data. In very much the Bolinger vein, Richard Meier has throughout his career urged linguists to focus on the influence of modality as they analyze sign languages (Meier 1982; Meier, Cormier, & Quinto-Pozos 2002; Meier, Rathmann, & Shield 2023; among many; and, especially, in classes – which the other of the authors of this paper attended). We fear sign linguists have lost sight of the dog – here, the data which are so clearly modality-specific.

Classifiers often correlate with but simply don't determine argument structure. The generalizations others have noted might hold of frequent, typical situations, but statistical analyses of large corpora are needed to confirm them (e.g. Kimmelman et al. 2019). What we do know is that theoretical analyses of classifier choice exclusively in terms of argument structure are empirically inadequate for many typologically unrelated sign language grammars.

Signers choose the appropriate classifiers to meet the communicative needs of the event they wish to express. The signer's ability to use classifier choice to highlight the non-agentiveness of a referent's participation and/or the result of the action with respect to that referent contributes to rich language expression. Maintaining the same classifier handshape for the same referent across several clauses facilitates reference tracking.

While classifier choice may be determined by a variety of factors beyond argument structure, the strong correlation between handling classifiers and transitivity and entity/body-part classifiers and intransitivity merits further discussion and study. Our contribution to further theory-development is threefold: First, we have shown that manual and non-manual articulators collaborate in the overall event description. In particular, the contribution of CA toward understanding argument structure is apparent in so many of the examples we have presented. Facial articulations can represent agents or themes, revealing the transitive nature of an event. Any theory that proposes a dependency relation between classifier and argument structure needs to account for these observations. We propose that manual and non-manual components may together form non-linearized complex predicates. Since the referent indexed by CA may be mentioned explicitly in the clause (see (3a)), the role of CA seems to be similar to that of (other types of) classifiers in agreeing with or indexing an argument of the CLP.

⁵ Note that a second possibility involves maintaining the same classifier across two CLPs for ease of articulation. The two possibilities cannot be distinguished given our data, and both may actually be at play here.

Second, complex predicates exist with more than one classifier. Bimanual CLPs force us to consider how the two hands come together to index the arguments of the clause, for instance, and raise the question of whether they can be considered serial verb constructions with a shared argument structure that happens to be produced simultaneously.

Third, sign languages once more teach us about linguistic possibilities we could not have stumbled upon if we had looked only at spoken languages. We need to fully accept that sign languages are bona fide languages and develop a linguistic theory that does not overgenerate but adequately accounts for the range of data that occur in human languages. This will entail integrating information about both perceptions and articulations in recognizing how modality restricts the grammatical possibilities available to the cognitive mechanism of language.

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