# Emojis and gestures: a new typology[1]

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**Abstract.** This paper addresses the question of how emojis are integrated into the text that they occur with. I use the typology of gestural iconic enrichments proposed by Schlenker (2018a, 2018b) to investigate the hypothesis that emojis denoting objects (e.g., 🎈) and activities (e.g., 🏇) project (i.e., interact with logical operators) when co-occurring with text in a similar way as gestures do with speech. In particular, I claim that [i.] emojis generate co-suppositions, i.e., assertion-dependent presuppositions, when immediately following text (e.g., the sentence "John didn't train today 🏋" gives rise to the inference that "if John had trained today, weightlifting would have been involved"); [ii.] emojis generate supplements (in the sense of Potts, 2005), just like appositive relative clauses, when they are separated from the accompanying text by a pause (e.g., the sentence "John trained today…🏋" gives rise to the inference that "John trained today, which involved weightlifting"); [iii.] when used as replacements for words (e.g., "Yesterday, John didn't 🏋 "), emojis have an at-issue semantics and can trigger standard presuppositions.

**Keywords:** emojis, co-speech gestures, not-at-issue meaning, projection, co-suppositions, supplements.

## 1. Introduction

Emojis are graphic symbols representing, among other things, facial expressions (e.g., 😃), objects (e.g., 🎈) and activities (e.g., 🏇), used almost ubiquitously in online communication. Due to their increasing popularity, over the past 20 years, the study of emojis has gained momentum in many different research fields, ranging from computer science to education studies and psychology (for a review, see Bai et al., 2019). In this paper, I address the question of how emojis are semantically integrated into the text that they occur with. My aim is to provide a first hypothesis on the projection behavior of emojis i.e., how non-face emojis interact with the logical structure of the accompanying text. The general claim is that the projective properties of emojis are similar to the ones displayed by gestures, following the typology put forward by Schlenker (2018a, 2018b). In particular, I claim that [i.] emojis generate co-suppositions, i.e., assertion-dependent presuppositions, when placed at the end of the message (e.g., "John trained today 🏋") [ii.] emojis generate supplements (in the sense of Potts, 2005), when case when a long pause separates the emoji from the text (e.g., "John trained today…🏋"); [iii.] when used as replacements for words (e.g., "Yesterday, John didn't 🏋"), emojis have an at-issue semantics.

[1] I would like to thank Emmanuel Chemla, Patrick Georg Grosz, Jeremy Kuhn, Pritty Patel-Grosz, Robert Pasternak, Philippe Schlenker, Lyn Tieu and the audience of Sinn und Bedeutung 25 for helpful comments and suggestions.

 In: P. G. Grosz, L. Martí, H. Pearson, Y. Sudo, and S. Zobel (eds.) *Proceedings of Sinn und Bedeutung 25*, pp. 720–732. University College London and Queen Mary University of London. 

### 1.1. Previous work

In linguistics, research has focused on whether emojis have a grammar (Cohn et al., 2019; Medlock and McCulloch, 2016), or on exploring their communicative functions (Gibson et al., 2018; Riordan et al., 2017). Interestingly, many have suggested that such functions are similar to the ones that gestures have in face-to-face communication (Alshenqeeti, 2016; Danesi, 2016; Na'aman et al., 2017; Gibson et al., 2018; Gawne and McCulloch, 2019). The most systematic account to date to pursue this idea is the one put forward by Gawne and McCulloch (2019), who argue that emojis act at on a multimodal level by filling the need for "the additional information provided by tone of the voice and body language in face-to-face communication". In their paper, they use the gestural semantics developed by McNeill (1992, 2005) and Kendon (2004), therefore proposing categories such as illustrative emojis, which, like illustrative (or iconic, to use McNeill's terminology) gestures refer to concrete objects. As an example, consider (1a), in which "**LARGE**" stands for the co-speech gesture of the two hands with the palms facing each other to indicate the size of the fish, and (1b), in which "🍕" illustrates the food in question. Both examples in (1) are drawn from Gawne and McCulloch (2019). The notation "**WORD** + [word]" is from now on used to indicate co-speech gestures, with the bolded word indicating the gesture, and the word enclosed in brackets indicating the co-occurring expression.

(1) a. …and the fish was [this big] + **LARGE**

b. I love pizza 🍕

Other categories from Gawne and McCulloch (2019) are metaphoric emojis, which, like metaphoric gestures, refer to abstract concepts, or illocutionary emojis, which, like illocutionary gestures (Kendon, 2004), are used to clarify the intent of the speaker.

In this paper, I build on Gawne and McCulloch's idea that the semantic contribution of emojis is similar to the one provided by gestures in speech. However, I specifically focus on the projective properties of emojis, i.e., how emojis produce non-at-issue meaning by interacting with the logical structure of the text. My general claim is that the projection behavior of emojis is similar to the one displayed by speech-accompanying gestures. To show this, I refer the typology of gestural projection provided by Schlenker (2018b).

### 1.2. Schlenker's typology of gesture projection

Schlenker's work is to be understood from within the framework of Super Semantics, whose goal is to study the semantic contribution to language provided by non-standard objects like gestures and vocalizations with the tools of formal semantics (Schlenker and Patel-Grosz, 2018; Schlenker, 2019). His typology, which has been applied not only to iconic gestures, but also to facial expressions (in combination with speech and sign language), vocalizations and sound effects (Pasternak, 2019), follows two main criteria. The first is whether the gesture is internal or external: a gesture is external if its semantic contribution is "optional", i.e., if it can be syntactically eliminated without affecting the acceptability of the sentence (Schlenker, 2018b); otherwise, it is internal. The second criterion is whether the gesture has its own time

slot (e.g., post-speech gestures follow the speech have their own time slot, as opposed to co-speech gestures).

Following this theory, co-speech gestures, which are external and do not have their own time slot (as they occur simultaneously with the speech), have a not-at-issue semantics and give rise to cosuppositions, i.e., assertion-dependent presuppositions in which the content of the gesture is conditionalized on the semantic contribution of the modified expression. In the unembedded environment in (2), drawn from Schlenker (2018b), the slapping gesture (indicated using the notation **SLAP**) generates the inference that punishing entails slapping, hence we get that "Little Johnny punished his team mate by slapping him" (from now on, the arrow "⇝" is used to indicate the inference that the example triggers, while "#⇝" indicates that the inference fails to arise. Instead, "#" preceding the example is used to mean that it is not acceptable).

(2) Little Johnny [punished] + **SLAP** his team mate
⇝ Little Johnny punished his team mate by slapping him

Instead, post-speech gestures are external and occur after the speech, in a separate time slot. These gestures, Schlenker argues, have a not-at-issue semantics, like co-speech gestures, but denote supplements, like appositive relative clauses, as in (3), drawn from Schlenker (2018b). The notation – **WORD** is from now on used to indicate post-speech gestures, with the dash used to mean that the gesture occurs after the spoken utterance.

(3) Little Johnny punished his teammate - **SLAP**
⇝ Little Johnny punished his teammate, which involved slapping

Finally, we find pro-speech gestures, which entirely replace speech, therefore occurring in their own time slot. These gestures are internal, as they cannot be syntactically eliminated without compromising the acceptability of the sentence, and display an at-issue semantics. As an example, consider the dialogue between two speakers in (4). The notation **WORD** is from now on used to indicate pro-speech gestures.

(4) *Speaker x):* - Little Johnny **SLAP** his teammate
*Speaker y):* - No, I know he didn't slap him!

### 1.3. Outline and method

In what follows, I try to show that non-face emojis, i.e., emojis denoting objects (e.g., 🎈) and activities (e.g., 🏇), interact with the logical structure of the accompanying text in a way that is similar to the one just presented for gestures, albeit with some differences, due to the fact that emojis and gestures belong to two very different mediums, i.e., online communication and face to face communication, respectively (we come back to this point in Section 2.2). In Section 2 I defend the claim that sentence-final emojis, i.e., emojis that immediately follow the accompanying text (e.g., "John didn't train yesterday 🏋️"), are external, have a not-at-issue semantics and give rise to co-suppositions. In this sense, they display the same projection behavior as co-speech gestures, although, unlike the latter, they can never occur simultaneously with text because of constraints on their linearization. In Section 3 I argue that that emojis,

when occurring after a pause (e.g., after an ellipsis, as in "John trained yesterday…🏆") or in a different turn (on instant-messaging platforms), are also external and not-at-issue, but generate supplements, like post-speech gestures. In Section 4 I explain why I focus on non-face emojis denoting objects and activities as opposed to face emojis. Indeed, I show that the latter, unlike the former, fail to trigger cosuppositions when appearing in a sentence-final position. In Section 5 I discuss emojis that fully replace words (e.g., "Yesterday, John didn't 🏆") which, I claim, behave like pro-speech gestures, i.e., are internal, at-issue, and can trigger standard presuppositions.

The strategy I follow in this study is to use constructed examples and introspective intuitions, which I corroborate with naturally-occurring examples collected through manual searches on Twitter. Crucially, a study recently conducted by Pasternak and Tieu (2020) provides initial experimental evidence for the projection behavior of sentence-final emojis as it is described here.

## 2. Cosuppositional emojis

### 2.1. Co-speech gesture projection

As shown in the previous section, Schlenker's typology treats co-speech gestures as cosupposition triggers, i.e., as triggering assertion-dependent presuppositions, with the content of the gesture conditionalized on the content of the modified expression (Schlenker, 2018a, 2018b). Crucially, Schlenker argues that these cosuppositional inferences project through different logical operators such as *negation* (5a), *modals* (5b), *question operators* (5c), *conditionals* (5d). In quantified environments, instead, with operators such as *each* (5e), *exactly one* (5f) and *none* (6c), cosuppositions project universally (Tieu et al. 2018). Examples from (5a) to (5e) are drawn from Schlenker (2018b), whereas (5f) comes from Schlenker (2018a). In examples (5d) and (5e), **UP** indicates the gestures of moving the palms upward.

(5) a. Little Johnny didn't [punish] + **SLAP** his teammate
⇝ If Little Johnny had punished his team mate, slapping would have been involved

b. Little Johnny might [punish] + **SLAP** his teammate
⇝ If Little Johnny punishes his teammate, slapping would be involved

c. Did Little Johnny [punish] + **SLAP** his teammate?
⇝ If Little Johnny punished his teammate, slapping would be involved

d. If Little Johnny takes part in the competition, will his mother [help] + **UP** him?
⇝ If Little Johnny takes part in the competition, if his mother helps him, lifting would be involved

e. Did each of these ten guys [lift] + **UP** his team mate?
⇝ For each of these ten guys, if they helped Little Johnny, they would do so by lifting him

f. Exactly one of these ten guys [punished] + **SLAP** his teammate
↝ For each of these ten guys, if he were to punish his teammate, slapping would be involved

In his work, Schlenker defends his theory against the competing account put forward by Ebert & Ebert (2014), who treat co-speech gestures as denoting supplements. The way he does this is by showing that, unlike supplements (Potts, 2005; for different theories see also Schlenker, 2010, 2013), co-speech gestures do not appear to be degraded in negative environments, as given in the examples in (6), which come from Schlenker (2018b).

(6) a. Little Johnny didn't [punish] + **SLAP** his teammate
#↝ Little Johnny had punished his teammate, which involved slapping
↝ If Little Johnny had punished his teammate, slapping would have been involved

b. It's unlikely that Little Johnny [punished] + **SLAP** his teammate
#↝ It's unlikely that Little Johnny punished his teammate, which involved slapping
↝ It's unlikely that Little Johnny punished his teammate, but if he did, slapping was involved.

c. None of these ten guys [helped] + **UP** his teammate
#↝ Little Johnny helped his teammate, which involved lifting
↝ For each of these ten guys, if he had helped Little Johnny, lifting would have been involved

In Section 2.3, I attempt to show on the same grounds that the projection behavior of sentence-final emojis should be modeled as triggering cosuppositions, after Schlenker (2018b), and not as supplement-denoting, in the spirit of Ebert & Ebert (2014).

## 2.2. Issues with emoji linearization and placement

One problem with applying Schlenker's typology to emojis is that unlike co-speech gestures, they can never occur simultaneously with text, because of how words are linearized in written text (Gibson et al., 2018). Gawne and McCulloch (2019) already tackled this issue, arguing that despite this difference, the fact that emojis are used together with text suggests that they contribute to the meaning of the sentence at a multimodal level, like gestures. I go even further, arguing that the placement of the emoji is still of importance for the projection behavior of emojis, in spite of the constraints imposed by their linearization. As we will see in the next section, when emojis appear in a sentence-final position immediately following text (e.g., "John didn't train today 🏋"), they seem project differently than when they are placed after a long pause like an ellipsis or in a separate turn (on instant-messaging platforms).

2.3. Sentence-final emojis generate cosuppositions

Sentence-final emojis are the most frequent placement of emojis in online communication (e.g., Novak et al., 2015). When appearing in this position, as given in the unembedded environment in (7), I argue that emojis have a not-at-issue semantics and trigger cosuppositions, in which the content of the emoji (e.g., 🏋) is entailed by the content of the expression it modifies (e.g., the verb "trained").

(7) John trained today 🏋
↝ John trained today by lifting weights

These cosuppositional inferences seem to project like co-speech gestures through the same embedded environments, i.e., with *negations* (8a), *modals* (8b), *question operators* (8c), *conditionals* (8d). Moreover, they seem to project universally with quantifiers *each* (8e), *exactly one* (8f) and *none* (9c).

(8) a. John didn't train today 🏋
↝ If John had trained today, weightlifting would have been involved

b. John might train today 🏋
↝ If Little Johnny trains today, weightlifting will be involved

c. Did John train today? 🏋
↝ If John trained today, weightlifting was involved

d. If John is motivated, he will train today 🏋
↝ If John is motivated, if he trains today, weightlifting will be involved

e. Did each of these ten guys train today? 🏋
↝ For each of these ten guys, if they trained today, weightlifting would be involved

f. Exactly one of these ten guys will train tomorrow 🏋
↝ For each of these ten guys, if he were to train tomorrow, weightlifting would be involved

Hence, we shall exclude a supplemental reading of sentence-final emojis, as like co-speech gestures they seem to appear freely in the same negative environments, as shown in the examples in (9).

(9) a. John didn't train today 🏋
#↝ John didn't train today, which involved weightlifting
↝ If John had trained today, weightlifting would have been involved

b. It's unlikely that John trained today 🏋️
#↝ It's unlikely that John trained today, which involved weightlifting
↝ It's unlikely that John trained today, but if he did, weightlifting was involved

c. None of these ten guys trained today 🏋️
#↝ None of these ten guys trained today, which involved weightlifting
↝ For each of these ten guys, none of them trained, but if he did, weightlifting would have been involved

Preliminary evidence which seems to confirm this comes from naturally-occurring examples in (10) from Twitter[2], as indicated by the notation [twitter].

(10) a. didn't train 🏊😪 [twitter]
↝ If author had trained, it would have involved swimming

b. Haha, no worries! I got nervous, I thought "But I didn't train!" 🚴‍♂️ [twitter]
↝ If author had trained , it would have involved running

Moreover, as anticipated in the introduction, experimental evidence supporting this claim has been recently provided by Pasternak and Tieu (2020), who collected inferential judgements showing that both sentence-final emojis and text-surrounding emojis (e.g., "the student will not 🚽step out of the classroom🚽"), which were used to convey a closer sense of synchrony, generate cosuppositional inferences, through the embeddings in the examples from (8a) to (8e) and in (9c).

## 3. Supplement-denoting emojis

As anticipated in Section 2.3, I shall now try to show that, in spite of linearization constraints, the position in which the emoji appears matters for determining whether the non-at-issue informational contribution of sentence-final emojis is cosuppositional or supplemental. Indeed, I argue that when the emoji occurs in a sentence-final position, but a long pause separates the emoji from the accompanying text, it is external and has a not-at-issue semantics (like sentence-final emojis immediately following text), but denotes a supplement. A way this can be achieved, I argue, is when the text and the emoji are split in two separate messages sent by the speaker, one following the other, in an instant-messaging platform, as in the constructed example (11). Consider also Figure 1, which is a realistic rendering of (11) created using a website for making fake text message conversations.

(11) *Speaker x):* - John trained today
*Speaker x):* - 🏋️
↝ John trained today, which involved weightlifting

[2] Examples coming from Twitter are anonymized for privacy reasons, although the contents of the examples have not been changed, as this could have altered their interpretation.

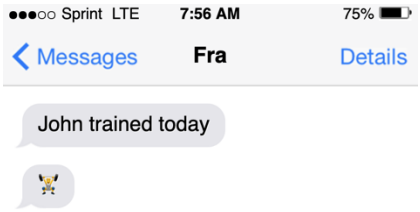


**Fig. 1**. *A realistic version of example (11), generated through https://ifaketextmessage.com/*

However, even though this way of separating the emoji and the text is attested as relatively widespread (e.g. Al-Rashdi, 2015), it often lacks order and coherence, e.g., as noted by Gibson et al. (2018), emojis can appear "in sequentially adjacent turns and look like they have a sequential relationship when they do not". Also, it may well be that people who are more used to break their messages into multiple turns, will not experience a clear pause between the message and the emoji, as opposed to sentence-final emojis that immediately follow the text (Lyn Tieu, p.c.). Finally, another problem with this way of enchaining messages is that it only concerns emoji use on instant-messaging platforms, so it does not apply for instance to emojis used in comments and posts on social networks like Facebook and Twitter. To overcome these issues, I argue that a supplemental reading for emojis can be obtained also by enforcing a long pause between the emoji by using punctuation, as in (12a) and (12b)[3].

(12) a. John trained today…🏋️
⇝ John trained today, which involved weightlifting

b. John trained today - 🏋️
⇝ John trained today, which involved weightlifting

Now, Schlenker (2018a, 2018b) argues that post-speech gestures are supplemental by showing that, unlike co-speech gestures and like appositive relative clauses, they appear to be degraded in some negative environments, as shown in the examples in (13), drawn from Schlenker (2018b).

(13) a. #Little Johnny didn't punish his teammate - **SLAP**

b. #It's unlikely that Little Johnny punished his teammate - **SLAP**

c. #None of these ten guys helped his son - **UP**

[3] Another risk for (11), (12a) and (12b) is that subjects might interpret the emoji as a separate utterance. In an experimental setting, this can be easily avoided by combining the long pause with a sentence ending, as in (v) and (vi).

(v) If John trains today… 🏋️, I'll hear about it
(vi) If John trains today - 🏋️, I'll hear about it

The same strategy can be applied to sentence-final emojis occurring in a separate time slot, which also appear to be degraded in the same negative environments, as shown in (14), (15) and (16).

(14) a. *#Speaker x)*: - John didn't train today
*#Speaker x)*: - 🏋️
b. #John didn't train today…🏋️
c. #John didn't train today - 🏋️

(15) a. *#Speaker x)*: - It's unlikely that John trained today
*#Speaker x)*: - 🏋️
b. #It's unlikely that John trained today…🏋️
c. #It's unlikely that John trained today - 🏋️

(16) a. *#Speaker x)*: - None of these ten guys trained today
*#Speaker x)*: - 🏋️
b. #None of these ten guys trained today…🏋️
c. #None of these ten guys trained today - 🏋️

## 4. What about face emojis?

Before moving to text-replacing emojis, I shall clarify the reason why I chose to focus exclusively on emojis that denote objects or activities, and not on face emojis (e.g., 😃), although the latter are more popular than the former in online communication (e.g., see: Emojitracker, 2021). Face emojis, together with other non-face symbols (e.g., 💞), are used to express affective states (for theories of the different semantic behaviors of face emojis and non-face emojis denoting objects and activities, see Grosz et al., to appear; Maier, 2020). Now, what appears when face emojis are placed in a sentence-final position immediately following the text, e.g., in a negative environment as in (23), is that they outscope the negation, thereby failing to generate a cosupposition. Instead, they seem to attach to the entire sentence, generating the inference "the speaker is sad that John won't train today"[4].

(23) John won't train today 😔
#↝ For John to train today, that would be sad (for the speaker)
↝ The speaker is sad that John won't train today

The same behavior seems to be preserved in the examples in (24), in which "😔" occurs in a separate turn (24a), after "…" (24b) and after "-" (24c).

(24) a. *Speaker x)*: - John won't train today
*Speaker x)*: - 😔

[4] Tangentially, the same pattern has been found by Schlenker (2018b) for post-speech facial expressions, which also seem to span the entire sentence. His explanation for this phenomenon is that the verbal phrase attachment is blocked by the negative environment, hence the emoji must attach to the entire sentence.

b. John won't train today…😔
c. John won't train today - 😔
#↝ For John to train today, that would be sad (for the speaker)
↝ The speaker is sad that John won't train today

Interestingly, it is worth noting that the disgusted face emoji "🤢" possibly represents an exception to these observations. Consider the naturally-occurring example (25), which was suggested to me by Patrick G. Grosz (p.c.), and the constructed version proposed in (26). In both examples, it seems like the emoji projects through the negation, instead of spanning the entire sentence. Further study is necessary to account for this puzzling phenomenon.

(25) Mum won't eat broccoli 🤢 [twitter]
↝ For mum to eat broccoli, that would be disgusting (for mum)
#↝ The speaker finds it disgusting that mum won't eat broccoli

(26) Thank God, we're not having broccoli 🤢
↝ For the speaker to eat broccoli, that would be disgusting
#↝ The speaker finds it disgusting that we're not having broccoli

## 5. At-issue emojis

Despite not being the most frequent, another attested placement of emojis is when they replace text (Al-Rashdi, 2015; Cohn et al., 2018). My claim is that the informational contribution of these emojis is, like pro-speech gestures, at-issue, taking up the role of the constituent the emoji is replacing, as exemplified by the dialogue in the constructed example (27), in which "🏋️" is interpreted as to mean either "lifting weights" or, prototypically, "train".

(27) *Speaker x):* - Yesterday, John 🏋️ for two hours[5]
*Speaker y):* - No, I know he didn't lift weights/train

Confirmation for this claim comes from naturally-occurring examples in (28), (29) and (30)[6].

(28) She is the 💣 [twitter]
↝ She is the bomb

(29) Sleepy and tired ... all I want is my 🛌 [twitter]
↝ Sleepy and tired… all I want is my bed

(30) It seems random but there is a reason John will soon be on a 🛫 to 🇸🇪 [twitter]
↝ It seems random but there is a reason John will soon be on a plane to Sweden

[5] Subjects might experience a higher endorsement for text-replacing emojis when they don't need inflectional morphology, e.g., "Tomorrow, I will 🏋️" is better than "Yesterday, I 🏋️", since the latter feels like it's missing a past tense "-ed". I thank Jeremy Kuhn for this observation
[6] The name in this tweet has been changed for privacy reasons.

Moreover, pro-speech gestures have been shown by Schlenker (2018b) to trigger standard presuppositions, as in the constructed example (31) (drawn from Schlenker, 2018b), in which **DOZE-OFF** stands for the gesture of bending the head forward with the eyes closed, so as to represent the act of falling asleep.

(31) In two minutes, our Chair might **DOZE-OFF**
↝ Our Chair is currently awake

The same phenomenon, I argue, can be observed for emojis, as illustrated in the constructed examples (32) and (33).

(32) In two minutes, Mary will soon 😴
↝ In two minutes, Mary will soon fall asleep
↝ Mary is currently awake

(33) The plane will soon 🛬
↝ The plane will soon take off
↝ The plane is currently on the ground

## 6. Open issues and conclusions

The objective of this article was to provide a first theoretical study of the projection behavior of emojis, which I argued is similar to the one displayed by gestures and other kinds of non-speech materials, like vocalizations and sound effects. In particular, I tried to show that when appearing at the end of the sentence, immediately following the accompanying text, emojis, like co-speech gestures, give rise to cosuppositions. Instead, when sentence-final emojis are separated from the text by a long pause, e.g., when appearing in a separate message or after an ellipsis, they denote supplements. Furthermore, when replacing the text, emojis are at-issue and can trigger standard presuppositions. Finally, I also showed how face emojis fail to trigger cosuppositions when appearing at the end of the sentence, attaching instead to the entire sentence.

Many open issues are left. First of all, experimental work is needed to assess this typology, e.g., by collecting acceptability and inferential judgements to establish whether sentence-final emojis immediately following text and sentence-final emojis occurring after a long pause have different projection behaviors. Moreover, further study is required to better understand the projective properties of face-emojis, for instance in order to account for the puzzling behavior of the disgusted face emoji. Finally, a promising research question is to explore the projection behavior of other placements of emojis, e.g., emojis that precede the accompanying text (e.g., "🏋 I didn't train today"), with the objective of enlarging this typology.

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