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Interactional functions of raised eyebrows by ironists and their addressees

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Abstract

Irony is not an exclusively verbal phenomenon: it may also be accompanied by bodily-visual cues such as facial expressions, head movements and gaze behaviour (e.g. de Vries et al., 2021). A well-known bodily-visual action related to irony is the use of raised eyebrows, with previous studies primarily focusing on ironists raising their eyebrows to signal an ironic intent, i.e. Tabacaru and Lemmens' (2014) gestural trigger *concept. This article builds on this concept by (1) verifying Tabacaru and Lemmens' (2014) conclusions based on a dataset of spontaneous ironic utterances (n = 128), and (2) adopting a broader perspective on irony by also taking into account the ironist's addressees' multimodal behaviour and the timing of the interlocutors' eyebrow movements. The article includes both an exploratory quantitative and a qualitative analysis. Results show that 38.3% of irony cases involve an eyebrow raise, coming from either the ironists (56.9%) or their addressees (43.1%). Eyebrow raises by ironists not only function as a cue for irony, but may also indicate surprise or a comprehension check, whereas addressees may raise their eyebrows to indicate surprise, understanding or agreement. Furthermore, raised eyebrows can also operate as a bodily-visual resource to (express an interactional willingness to) join an ironic interactional layer or be a part of a multimodal package that establishes an ironic layer on its own, without a verbal manifestation of irony. In conclusion, this article thus expands Tabacaru and Lemmens' (2014)* gestural trigger *concept, illustrating the importance of adopting a sequential-interactional perspective on the multimodal dimension of irony.*

Keywords: raised eyebrows, irony, gestural trigger, multimodal stance-taking.

1. Introduction

Ironic utterances are often accompanied by bodily-visual cues such as facial expressions, head movements and marked gaze behaviour (e.g. de Vries et al., 2021). In Example 1, taken from the dataset of the current study, Noor and Michael have been discussing their collaboration in a joint school project. After Michael jokingly states that he does not like to compromise, Noor goes along and states that it is "scandalous" how much of a follower she is. Noor's utterance can be interpreted as self-directed jocularity (a humorous tease that is considered a subtype of irony according to Gibbs, 2000). The speaker's bodily-visual behaviour includes several irony markers that have been acknowledged in research on the multimodal expression of irony (González-Fuente et al., 2015; de Vries et al., 2021; Tabacaru, 2019), including raised eyebrows (on the transcription conventions, see the Appendix at the end of the paper):

Example 1

```
01 Noor              ik volg gewoon altij';
                     i always just follow;
02                   *£(2.0)   £
   noor              *raised eyebrows -->
   noor               £head nod£
03 Noor              µschan*daligµ
                      scandalous
   noor                 -->*
   noor              µhead tilt  µ
```

An increasing amount of studies focuses on this multimodal dimension of irony or humour in general, and the role that different semiotic resources might play in communicating and negotiating the meaning of an utterance (e.g. de Vries et al., 2021; Tabacaru, 2019). Many theories conceptualise irony or humour as a communicative phenomenon that involves an additional processing layer or construction step with regards to meaning-making, which has been embedded in frameworks involving *implicature* (Grice, 1975), *pretence* (Clark & Gerrig, 1984), or *inferencing* (Lozano-Palacio & Ruiz de Mendoza Ibáñez, 2022). Following a general shift in focus towards accounting for the role of multimodal resources in detecting, conveying and even co-constructing pragmatic inferences (see e.g. Borràs-Comes et al., 2011; Prieto et al., 2011, 2013), attention to the multimodal expression of irony is increasing.

So far, research has mainly looked into the multimodal expression of an ironic intention on the speakers' part, with arguably the most extensively studied markers of irony being laughter (Attardo et al., 2011; Bryant, 2011) and prosody or a deviant tone of voice (Bryant, 2010, 2011; Bryant & Fox Tree, 2002, 2005; Hancock, 2004; Rockwell, 2000). Additionally, specific facial expressions such as smiling, eye-rolling, squinting or winking (Attardo et al., 2003, 2011; Caucci & Kreuz, 2012), as well as a notably expressionless or blank face (Attardo et al., 2003), also signal an ironic stance. Head movements can cue irony as well, as studies show an increase in head tilts, head shakes and head nods during ironic utterances compared to non-ironic speech (González-Fuente et al., 2015; de Vries et al., 2021; Tabacaru, 2019). Moreover, de Vries et al. (2021) observe an increase in body repositionings in ironic utterances and Yu (2012) notes that (exaggerated) hand gestures may indicate a non-serious layer of interaction. Specific gaze patterns have been related to irony as well, as speakers tend to avert their gaze away from their interlocutors while producing ironic utterances (Williams et al., 2009; González-Fuente et al., 2015; Gironzetti, 2022) and change their gaze direction more often during ironic speech compared to non-ironic verbal conduct (González-Fuente et al., 2015; Brône & Oben, 2022).

Furthermore, de Vries et al. (2021) observe that bodily-visual irony markers cluster into "multimodal packages", referring to positive correlations between various measures of gaze behaviour, hand gestures and mutual gaze, and laughter and gaze directions. Considering the

co-occurrence of raised eyebrows and other bodily-visual resources, Tabacaru (2019) notes that eyebrow movements often combine with head tilts or head nods. Finally, different methodological approaches were taken with regard to the data: some studies investigate interactions in semi-lab settings (Attardo et al., 2011; Bryant, 2011, de Vries et al. 2021), others investigate elicited talk based on prompts (Hancock, 2004; Caucci & Kreuz, 2012; González-Fuente et al., 2015), scripted data from TV shows (Tabacaru 2019) or elicited data based on sentence reading (Rockwell, 2000; Williams et al., 2009) with these different settings potentially impacting the results.

While most research on the multimodal dimension of irony thus primarily focuses on how speakers apply bodily-visual resources to mark an ironic intent, some studies do also consider the bodily-visual behaviour of the ironist's addressees. Brône and Oben (2022) observe an increase in eye contact between the ironist's interlocutors during ironic utterances, which can be interpreted as a visual comprehension check. Similarly, de Vries et al. (2021) observe more gaze shifts to and from the interactants at the end of an ironic utterance, indicating a visual comprehension check or an invitation to join the ironic pretence.

This study particularly focuses on the use of raised eyebrows vis-à-vis ironic utterances. In general, Ekman (1979, p. 184) characterises eyebrow movements as *underliners*, which, like prosody, can emphasise a particular part of an utterance and thereby convey specific conversational functions. More recent research has related the use of eyebrow raises to various specific conversational or interactional functions, such as expressing obviousness (Jehoul et al., 2017), shock (Schröder, 2020), a negative stance (Li, 2021) or a request (Hübscher et al., 2019). Additionally, raised eyebrows have been linked to repair initiations (Oloff, 2018) and change-of-state or newsmark actions (Gudmundsen & Svennevig, 2020; Mondada, 2011; Dix & Groß, 2024), especially as an expression of surprise (Ekman & Friesen, 1969; Ekman & Oster, 1979; Kaukomaa et al., 2015).

In relation to sarcasm, Tabacaru and Lemmens (2014) characterise raised eyebrows as *gestural triggers*, or bodily-visual resources that guide addressees to the humorous interpretation of a sarcastically intended utterance. In particular, Tabacaru and Lemmens (2014, p. 25) argue that eyebrow raises "highlight the speaker's attitude and mark the non-seriousness of the utterance, facilitating the audience's access to the pretence of the intended implicature of the utterance". As both sarcasm and irony are generally conceptualised as phenomena that involve an additional processing or construction step with regards to meaning-making (e.g. Grice, 1975), we will apply Tabacaru and Lemmens' (2014) gestural trigger concept to irony as well.

Although Tabacaru and Lemmens (2014) do not make specific predictions regarding the timing of raised eyebrows, a number of studies investigating bodily-visual resources in a broader range of social actions claim that they mainly occur at the beginning of an utterance, functioning as early *facilitators of social action recognition* (Kaukomaa et al., 2013, 2014; Kendrick & Holler, 2017; Ter Bekke et al., 2020; Nota et al., 2021). In the case of irony, however, González-Fuente et al. (2015) observe that facial expressions and head movements systematically occur towards the end of ironic utterances. In their dataset, 70% of irony cases contain such a "gestural coda", which significantly increases ironic interpretations (González-Fuente et al., 2015). Moreover, participants were also more likely to interpret default utterances as ironic in the presence of a gestural coda (González-Fuente et al., 2015).

Given the predominant focus on the multimodal expression of an ironic intent and the use of raised eyebrows as a cue for irony (cf. gestural trigger), this article aims to contribute to ongoing research on the multimodal dimension of irony by (1) also analysing eyebrow raises by the ironists' interlocutors, by adopting a sequential-interactional perspective that takes the relative timing of the eyebrow movements into account, and (2) considering the range of possible interactional functions of raised eyebrows in ironic contexts. Furthermore, the dataset for this study consists of *spontaneous* ironic utterances excerpted from triadic conversations

among friends catching up in a coffee bar, whereas previous irony research predominantly draws on lab-based (e.g. Attardo et al., 2011), elicited (e.g. Caucci & Kreuz, 2012) or fictional (e.g. Tabacaru & Lemmens, 2014) irony cases. Therefore, this paper also aims to empirically verify whether previous observations and concepts related to the multimodal dimension of irony (such as Tabacaru and Lemmens' (2014) gestural trigger notion) can also be observed in a spontaneous dataset. Including both an exploratory quantitative and a more in-depth qualitative analysis, this article addresses the following research questions:

1. What is the relative frequency of spontaneous ironic utterances featuring an eyebrow raise by at least one of the interactants?
2. Do the eyebrow raises mostly come from the ironists themselves or their interlocutors?
3. Do the interactants' eyebrow raises mostly start before, during or after the ironic utterances?
4. What is the sequential positioning of the eyebrow raises in relation to other relevant bodily-visual resources?
5. Which interactional functions of eyebrow raises can be determined in this dataset of spontaneous irony? Do these interactional functions align with previous observations and concepts, such as Tabacaru and Lemmens' (2014) *gestural trigger* concept?

The article is structured as follows: Section 2 discusses the data collection and the annotation procedure for irony and eyebrow movements. Section 3 contains an exploratory quantitative analysis of the dataset, thereby addressing the first three research questions. Subsequently, Section 4 includes a qualitative analysis of four excerpts of the dataset, in order to examine research questions four and five. The findings as well as some limitations of this study and avenues for further research are discussed in Section 5.

2. Data and methods

2.1. Coffee bar corpus: participants and procedure

The corpus consists of triadic conversations among friends catching up in a coffee bar. The participants are native speakers of Dutch recruited from the local student community at the University of Leuven (Belgium) and thus aged between 17 and 24. Prior to the data collection, all the participants received an information letter about the general goals of the study and the processing of their personal data and signed an informed consent contract. Concretely, all personal data were anonymised before the start of the annotation phase and the contract additionally offered the possibility to request anonymisations of screenshots used for publications or presentations. The participants were compensated with a coffee or tea of their choice, as well as a gift voucher of 7,5 euros for the coffee bar.

After consenting to being recorded, the participants were simply asked to talk to each other for twenty minutes as if they would normally do. In order to reduce the sense of participating in a scientific study as much as possible, the recordings took place in a student coffee bar that was simultaneously serving other customers as well. In conclusion, the corpus consists of spontaneous triadic interactions between friends in a –to the best possible extent– authentic context. Excluding the first five minutes of interaction, the corpus consists of twelve conversations of fifteen minutes, resulting in a total of three hours of data. Figure 1 illustrates the recording set-up, including three GoPro cameras directed at the participants as well as two overhead camera perspectives.

Figure 1. Recording set-up

2.2. Data analysis

Analogous to de Vries et al. (2021), speech was transcribed at the level of the intonation unit and according to the GAT2 transcription conventions (Selting et al., 2009), of which an overview of the transcription symbols used in the excerpts is included in the Appendix. Both the transcriptions and the annotations of irony and eyebrow movements were done via ELAN (Wittenburg et al., 2006). This study looks at the multimodal dimension of irony and so, in order to avoid a circular approach, the dataset was first annotated for irony based on definitions of ironic subtypes, rather than different semiotic features of irony. In line with recent studies on the multimodal dimension of irony using semi-spontaneous data (Brône & Oben, 2022; de Vries et al., 2021; Gonzalez-Fuente et al., 2015), the dataset was annotated according to Gibbs' (2000) classification of irony. With a broad perspective on what can be considered *ironic*, Gibbs (2000) defines five subtypes of irony:

1. Jocularity: speakers tease one another in a humorous way;
2. Sarcasm: speakers speak positively to convey a more negative intent;
3. Rhetorical question: speakers literally ask a question that implies either a critical or a humorous assertion;
4. Hyperbole: speakers express nonliteral meaning by exaggerating the reality of the situation;
5. Understatement: speakers state far less than is obviously the case.

Gibbs (2000) also distinguishes between self- and other-directed jocularity, referring to speakers teasing themselves or (one of) their interlocutor(s). Lastly, Gibbs (2000) additionally categorises *echo* as a subtype of jocularity, which was added as a separate annotation label given its relatively large number of occurrences in the dataset. The echo subtype involves both explicit echoes of a previous utterance in the interaction and implicit echoes of the general discourse around a particular topic of conversation (Gibbs, 2000).

The annotations revealed a total of 193 ironic utterances, including 99 instances of jocularity (51.3%), 41 echoes (21.2%), 39 hyperboles (20.2%), eight cases of sarcasm (4.1%), five rhetorical questions (2.6%) and one understatement (0.5%). An inter-coder agreement test was conducted to assess the reliability of the irony annotations. A second coder annotated thirty minutes of data for irony, without distinguishing between Gibbs' (2000) ironic subtypes. Gibbs' (2000) classification was used to identify ironic utterances in the dataset, but the ironic subtypes will not be discussed as a variable in the ensuing analyses. Thus, the ICA-test assesses the agreement between the coders' *detection* of irony rather than the classification of ironic

utterances into different subcategories. Resulting in an agreement percentage of 97.6% and a Cohen's Kappa of 0.636, the ICA-test indicated a significant agreement between the two raters (Sim & Wright, 2005).

Eyebrow movement was annotated in eight out of twelve triads, because some of the participants' eyebrows in Triads 3, 4 and 14 were not visible enough (because of their hairstyle and/or glasses) and because Triad 15 did not contain ironic utterances. The interactants' eyebrow movements were thus analysed in two hours of data, including 128 of the 193 ironic utterances in the dataset. Analogous to Nota et al. (2021), the eyebrow movements were annotated in a time slot including the ironic utterance and the 200 milliseconds before/after the start/end of the irony. If necessary, the annotation timeslot was extended to include the start or end point of the eyebrow movement. Following Nota et al. (2021), the interactants' eyebrow movements were annotated for the categories "raise", "frown" and "frown raise" (exemplified in Figure 2). The annotations, however, reveal that our dataset of spontaneous ironic utterances primarily features eyebrow raises (72 instances), compared to nine instances of furrowed eyebrows (i.e. frowns) and six frown raises, which is why this article focuses on the use of raised eyebrows in ironic interactions.

Figure 2. Examples of an eyebrow raise, frown and frown raise from the dataset

3. Quantitative analysis

The exploratory frequency analyses of the dataset show that 38.3% of irony cases features at least one eyebrow raise by one of the interactants, with 56.9% of eyebrow raises coming from the ironists themselves and 43.1% from their interlocutors. In particular, 28.9% of irony cases features at least one eyebrow raise by the ironist, while 18% includes an eyebrow raise by one of the two addressees and only 2.3% features eyebrow raises by both of the addressees.

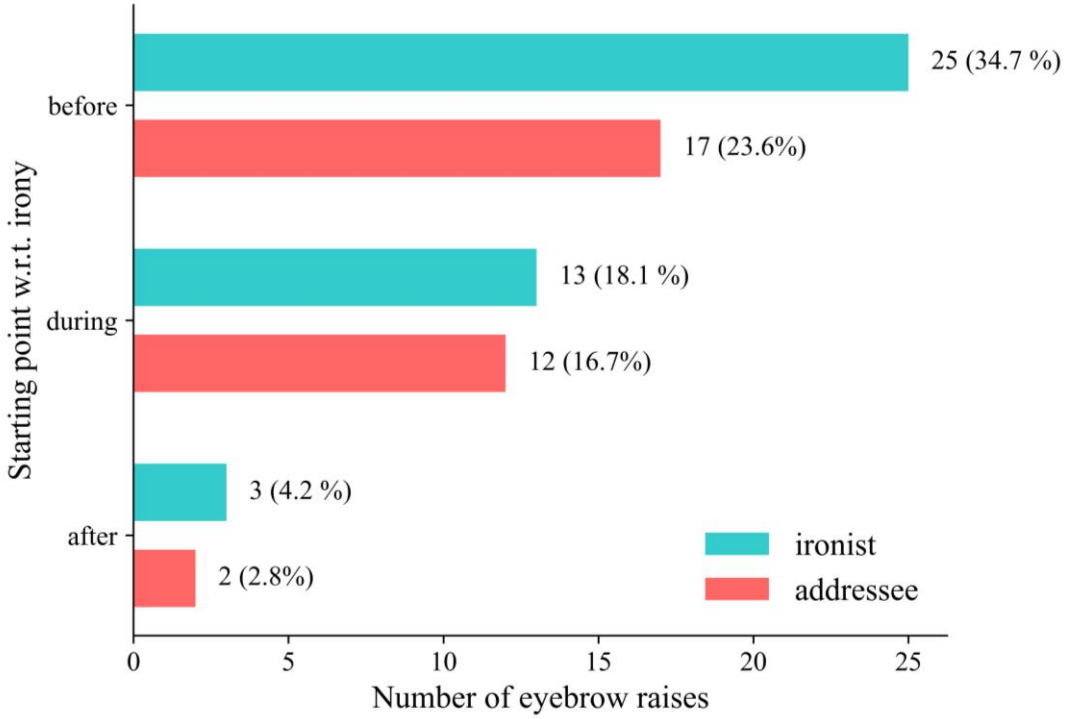

Figure 3. Timing of eyebrow raises

Figure 3 illustrates the timing of the eyebrow raises according to their starting point, differentiating between the ironists and their addressees. Eyebrow raises starting "before" the irony occur during the 200 ms before the ironic utterance, with their starting point either falling within those 200 ms or even before that. In Example 1 (in the Introduction), the ironist's eyebrow raise starts more than two seconds before the verbal irony (line 2), but continues until the middle of the ironic utterance (line 3). Because the eyebrow raise occurs during the 200 ms before the start of the ironic utterance, these raised eyebrows are categorised as "before" the verbal irony.

Example 1 (repetition)

```
01 Noor              ik volg gewoon altij';
                     i always just follow;
02                   *£(2.0)   £
   noor              *raised eyebrows -->
   noor               £head nod£
03 Noor              µschan*daligµ
                      scandalous
   noor                 -->*
   noor              µhead tilt  µ
```

Eyebrow raises "after" the irony start within 200 ms after the end of the ironic utterance, whereas "during" means that the eyebrow raise's starting point co-occurs with the verbal irony. Out of all the eyebrow raises observed in the ironic interactions in this dataset, 58.3% start before the ironic utterance, 34.8% during and 7% after. Interestingly, both ironists *and* addressees mostly start raising their eyebrows before the verbal irony, followed by during and then after the ironic utterance.

4. Qualitative analysis

The qualitative analyses not only consider eyebrow raises, but also how these eyebrow movements co-occur with other bodily-visual resources and their interactional functions. The interactants' bodily-visual behaviour is analysed in a wider timeslot than 200 ms before and after the ironic utterance, allowing us to take into account other relevant bodily-visual cues and thus offering a more nuanced perspective on the sequential embedding of the eyebrow movements. We have selected four excerpts to explore the interactional functions of eyebrow raises by speakers and/or addressees of ironic utterances. The first two excerpts only include eyebrow raises by the ironists, whereas the latter two excerpts also contain raised eyebrows by their interlocutors.

4.1. Raised eyebrows as an irony marker and comprehension check

In the first excerpt, the ironist (Lukas) swiftly raises his right eyebrow twice at the end of his ironic utterance. The excerpt is situated in a conversation about driving lessons and in the first line, Felix explains that he has trouble with the wrist movement of shifting gears.

Excerpt 1

```
01 Felix            µ*ik weet nie' da' zit nog nie' in mijn pols;
                    i don't know it's not in my wrist yet;
   felix            µdepicts shifting gears -->
   lukas             *looks at felix -->
02 Felix            of in mijn hand ofzo dus;=
                    or in my hand or something;
03 Lukas            =[<<laughing> da' zit [nog nie' in mijn*&#%po->              #
                                          it's not yet in my wri
   lukas                                                  -->*
   lukas                                                     &looks at joris -->
   lukas                                                      #raises r eyebrow 2x#
   fig                                                        %fig4
04 Felix             [((laughs))
05 Joris                                  £[da' duurt da' duurt heel lang echt ja£µ&
                                           it takes it takes a really long time yes
   joris                                  £head nods                                £
   felix                                                                         -->µ
   lukas                                                                          -->&
```

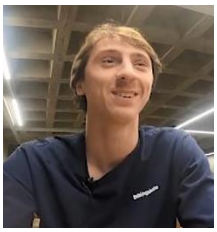

Figure 4. Lukas

When Felix states that "it's not in [his] wrist yet", gesturally depicting the hand and wrist movement of shifting gears, Lukas starts looking at Felix and then responds by laughingly repeating his utterance (line 3). In this case, the irony type is thus an explicit echo of an interlocutor, which is a form of other-directed jocularity (Gibbs, 2000). In other words, Lukas' repetition of Felix's utterance indicates that the way Felix acknowledges his poor driving skills is amusing to him. Lukas' ironic intent is marked by both laughter and two eyebrow raises at the end of his utterance, which co-occur with a shift in gaze direction from Felix to Joris. The

ironic utterance overlaps with laughter by the targeted interlocutor, Felix, in line 4 and a shift to the serious layer by Joris in line 5.

The timing of Lukas' eyebrow movement adheres to the idea that ironic utterances are often supplemented by a bodily-visual cue for irony towards the end of the utterance or, in other words, a gestural coda (González-Fuente et al., 2015). The use of a gestural coda facilitates the recognition of an ironic intent and thereby aligns with Tabacaru and Lemmens' (2014) gestural trigger concept. Moreover, Lukas simultaneously shifts his gaze direction from the jocular target (Felix) towards the third party (Joris). Both González-Fuente et al. (2015) and de Vries et al. (2021) interpret such a gaze shift at the end of an ironic utterance as a visual check whether the addressees have understood the irony. In this excerpt, the eyebrow movement thus functions as a bodily-visual irony marker and as a visual comprehension check.

4.2. Raised eyebrows in a multimodal package that establishes the ironic layer before the verbal irony

In Excerpt 2, the ironist (Emily) raises her eyebrows before the start of her ironic utterance. Before the start of the excerpt, the participants had just received their coffee or tea orders, along with three chocolates of different flavours. In line 1, Ilse immediately claims the chocolate flavour she prefers.

Excerpt 2

```
01 Ilse             µnou ik ga % deze al pakken;µ
                    well i'm already going to grab this one;
   ilse             µsmile                      µ
   fig                          %fig5
02 Ilse             µ((laughs))    µ
   ilse             µlooks at emilyµ
03 Bieke            ((laughs))
04                  &(.)%&
   emily            &raised eyebrows, open mouth, head shakes&
   fig                  %fig6
05 Bieke            1[((laughs))
06 Ilse             1[((laughs))
07 Emily            1[&OKE& jij doet dat zomaar;
                    OKAY you just do that;
   emily              &head shakes&
08 Bieke            2[wa' zijn de andere?
                    what are the other ones?
09 Emily            2[is da' een kamille?
                    is that chamomile?
```

Figure 5. Ilse

Figure 6. Emily

Ilse smiles when she claims her preferred chocolate flavour (Figure 5) and then starts laughing while looking at Emily in line 2. Subsequently, Bieke laughs as well (line 3) and Emily raises her eyebrows and shakes her head with an opened mouth (Figure 6). This is followed by laughter coming from both addressees (lines 5-6). Overlapping with Bieke and Ilse's laughter, Emily shakes her head and playfully adopts an angry tone of voice while saying "okay you just do

that" (line 7). Emily's head shakes and marked prosody indicate an ironic intent, rather than a sincere accusation at the expense of Ilse. Accordingly, Emily's bodily-visual and prosodic behaviour supports the formation of another layer within the interaction in which she pretends to be angry with Ilse. Emily's utterance is thus a playful tease and, in other words, an example of other-directed jocularity (Gibbs, 2000). In line 8, however, Bieke immediately returns to a serious layer of interaction by asking about the other flavours, in overlap with a question on the tea flavours by Emily in line 9.

This excerpt contains an example of raised eyebrows by the ironist, where the eyebrow movement occurs entirely before the start of the ironic utterance. In that sense, it can be argued that the eyebrow raise foreshadows Emily's use of verbal irony, thereby operating as a pre-ironic version of Tabacaru and Lemmens' (2014) *gestural trigger* concept. This interpretation, however, artificially isolates the eyebrow raise from the bodily-visual resources it co-occurs with, namely head shakes and an opening of the mouth. These bodily-visual actions have been attributed the interactional functions of indicating, respectively, refusal and/or distance (Evaldsson & Melander, 2017; Kärkkäinen, 2012) and surprise (Ekman & Friesen, 1978). Combined with the use of raised eyebrows, which may signal both surprise or shock (Kaukomaa et al., 2015; Schröder, 2020) and irony (e.g. Tabacaru & Lemmens, 2014), this cluster of bodily-visual resources may signal another interactional layer in which Emily is appalled by Ilse's action. Instead of simply functioning as a pre-ironic cue, the eyebrow raise thus seems to be part of a multimodal package that establishes an ironic meaning on its own, without a verbal manifestation of irony. Furthermore, it can be argued that Ilse's bodily-visual behaviour already opens the playful ironic stance before that, as she both laughs and shifts her gaze in the direction of Emily while claiming the chocolate.

4.3. Raised eyebrows marking irony, understanding and agreement, and establishing a joint ironic interactional layer

In the third excerpt, the ironist (Melanie) raises her eyebrows during the first half of her ironic utterance, after which one of the interlocutors (Noor) immediately raises her eyebrows as well. Before the start of the excerpt, Melanie mentioned that she would like to buy an automatic soup maker to be able to make soups in her student dorm. According to Michael, however, an ordinary blender would suffice:

Excerpt 3

```
01 Michael          £als ge ne % mixer koopt,
                    if you buy a mixer,
   michael          £frown, squinting -->
   fig                        %fig7
02 Michael          [<<all> is da' ook niet veel moeite om da' te maken hè,>£
                           it's not a lot of effort to make it hè,
   michael                                                          -->£
03 Noor             [µ&((la#ughs))µ
   melanie           µsmile       µ
   melanie            &looks at noor -->
   melanie                 #head tilt -->
04 Melanie          *µ'k % zal eens effe # zeventig euro µ [gaan betalen
                    i'll just go and pay seventy euros
   noor             *looks at melanie -->
   melanie           µraised eyebrows                    µ
   melanie                          -->#
   fig                    %fig8
05 Noor                                                    [*<<laughing> % ja>*
                                                                yes
   noor                                                     *raised eyebrows  *
   fig                                                              %fig9
06 Melanie          voor zo een <<laughing> kutding>*&
                    for such a shitty thing
   noor                                          -->*
   melanie                                        -->&
```

Figure 7. Michael

Figure 8. Melanie

Figure 9. Noor

Both frowning and squinting (Figure 7), Michael claims that it does not take a lot of effort to make soup with an ordinary mixer (lines 1-2). Subsequently, Noor starts laughing and Melanie smiles and tilts her head with her gaze directed at Noor (line 3). In response to Michael's statement, Melanie then says that, in that case, she will just pay seventy euros for a "shitty" mixer (lines 4 and 6). At the beginning of line 4, however, Melanie is both tilting her head and raising her eyebrows (Figure 8), thereby using two bodily-visual irony markers. As she uses a positive formulation ("[she] *will* go and pay seventy euros") to convey a negative intention (an ordinary mixer is "shitty" and, in fact, not worth spending that much money on), this is an example of sarcasm (Gibbs, 2000). During the sarcastic utterance, Melanie's gaze is still directed at Noor, who looks back at Melanie, raises her eyebrows (Figure 9) and laughingly says "yes" in overlap with Melanie's turn at talk (line 5).

In lines 3 and 4, Melanie's bodily-visual behaviour marks her negative stance towards Michael's comment and the use of regular mixers. Her raised eyebrows therefore also signal the insincere nature of her agreement with Michael and, in that sense, the eyebrow raise interactionally functions as an irony marker during the ironic utterance (cf. Tabacaru and Lemmens' (2014) *gestural trigger* concept). Additionally, this excerpt includes an example of raised eyebrows by one of the ironist's interlocutors. Concretely, Melanie raises her eyebrows at the beginning of her ironic utterance, which is immediately followed by an eyebrow raise coming from Noor. Alongside the laughing "yes" in line 5, this multimodal alignment (Oben &

Brône, 2016) indicates that Noor both understands the ironic layer and also agrees with Melanie's point of view. Furthermore, the multimodal alignment establishes a joint ironic interactional layer between the ironist and one of their interlocutors, excluding the target of the ironic utterance.

4.4. Raised eyebrows marking irony, surprise and an interactional willingness to join the ironic interactional layer

The fourth and final excerpt includes a total of ten eyebrow raises. On the one hand, the ironist (Jilske) raises her eyebrows multiple times before, during as well as after the ironic utterance. On the other hand, the excerpt also includes several eyebrow raises by both addressees, which notably all occur before the start of the first ironic utterance. In line 1, Jilske mentions that a friend of the interactants, Marie, is planning on visiting another friend of theirs, Lisa, who is currently studying abroad.

Excerpt 4

```
01 Jilske          µeuh marie ga op bezoekµ bij lisa.
                   uh marie is going to visit lisa.
   jilske          µraised eyebrows       µ
02 Nikki           [*ouh::          * wa'?
                                      what?
   nikki            *raised eyebrows*
03 Yana            [£ouh:::,          £
   yana             £raised eyebrows 3x£
04 Jilske          [µdit weekend j%a,  µ
                   this weekend yes,
   jilske           µraised eyebrows 2xµ
   fig                          %fig10
05 Nikki           *amai;                *=
                    wow;
   nikki           *widened eyes, head tilt*
06 Jilske          =µzij heeft nogalµ &tijd%,
                   she has quite some time,
   jilske           µraised eyebrowsµ &raised eyebrows, head shakes -->
   fig                                 %fig11
07                 (.)&
   jilske          -->&
08 Nikki           me' 't vlieg[*tuig % effe:;              *
                   by plane quickly;
   nikki                       *index finger depicts journey*
   fig                               %fig12
09                 &(.)&
   nikki           &head tilt&
10 Yana                        [amai?
                                wow?
11                 µ(-)
   jilske          µraised eyebrows, head nods -->
12 Jilske          %letterlijkµ
                   literally
   jilske                  -->µ
   fig             %fig13
```


Figure 10. Jilske


Figure 11. Jilske

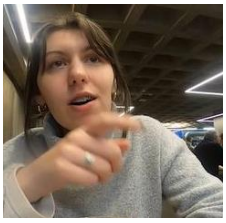
Figure 12. Nikki


Figure 13. Jilske

Jilske raises her eyebrows while saying that Marie is going to visit Lisa, which is followed by utterances of surprise as well as eyebrow raises by both addressees (lines 1-3). Subsequently, Jilske raises her eyebrows again (Figure 10) and clarifies that the visit is planned "this weekend" (line 4). This is followed by another expression of surprise coming from Nikki, who widens her eyes, tilts her head and says "wow" (line 5). Concurrent with two bodily-visual irony markers, namely raised eyebrows and head shakes (Figure 11), Jilske then states that Marie seems to have "quite some time" (line 6). As she uses a positive formulation ("she *has* quite some time") to convey an opposite opinion, namely that she doubts that Marie can afford to take the weekend off, Jilske's utterance is an example of sarcasm (Gibbs, 2000). With a rising pitch, Nikki then comments that Marie would need to travel by plane (line 8), depicting the journey there and back by quickly moving her index finger from left to right (Figure 12). Nikki's framing of the plane journey as quick and therefore easy can be interpreted as an understatement (Gibbs, 2000), which is sustained by her head tilt in line 9. Subsequently, Jilske raises her eyebrows and nods her head (Figure 13), affirming and emphasising Nikki's statement in line 12 ("literally").

This excerpt includes several instances of eyebrow raises interactionally functioning as an expression of surprise (e.g. Kaukomaa et al., 2015). Before the ironic utterance, all three of the interactants raise their eyebrows in response to Marie's action. This multimodal alignment (Oben & Brône, 2016) is prompted by Jilske, who immediately frames her message as surprising by raising her eyebrows in line 1. Additionally, Nikki's widened eyes (Kaukomaa et al., 2015) and head tilt (Kääntä, 2014) respectively indicate surprise and a questioning stance as well. Furthermore, it can be argued that these pre-ironic eyebrow raises are part of a build-up towards an ironic layer within the interaction. Yana and Nikki's multimodal alignment with Jilske's raised eyebrows namely shows an interactional willingness to join Jilske's stance on their friend's action. In particular, Nikki seems to immediately recognise the ironic layer when Jilske sarcastically suggests that Marie has plenty of free time, as she insinuates that Marie seems to think that it is quick and self-evident to go on a vacation that requires you to travel by plane. Finally, this excerpt includes another example of an eyebrow raise functioning as an irony marker or gestural trigger (Tabacaru & Lemmens, 2014), as well as an eyebrow raise operating as a beat gesture (McNeill, 1992) accompanying a verbal emphasiser.

5. Discussion and conclusions

In this final section, we discuss the various interactional functions and sequential positionings of raised eyebrows by both ironists and their addressees that the analyses put forward.

The quantitative analysis primarily functions as an exploratory analysis of the dataset to gauge the use of raised eyebrows *vis-à-vis* spontaneous irony. Most importantly, it is shown that 38.3% of irony cases features at least one eyebrow raise by the ironist or an addressee. Despite the inclusion of the bodily-visual behaviour of the ironist's interlocutors, we observe relatively less eyebrow raises than Tabacaru and Lemmens (2014), who identified eyebrow raises in 58.,4% of sarcastic utterances. A possible explanation is that our dataset consists of spontaneous rather than fictional interactions where actors may consciously anticipate and explicitly stage

the irony for dramatic purposes. Nevertheless, more than a third of the ironic utterances in our corpus features at least one eyebrow raise, indicating a significant link between raised eyebrows and spontaneous irony. Additionally, results show that 56.9% of eyebrow raises comes from the ironists, whereas 43.1% can be attributed to their addressees. The link between raised eyebrows and irony thus not only applies to the ironists themselves, but also to the recipients of the ironic utterances.

Regarding timing, the analysis shows that 58.3% of eyebrow raises starts before the verbal irony, whereas 34.8% starts during the ironic utterance and 7% afterwards. Interestingly, both speakers *and* addressees mostly start raising their eyebrows before the beginning of an ironic utterance, followed by during and then after the verbal irony. While eyebrow raises by addressees would be expected during or after the ironic utterance (as an embodied response), addressees also seem to be able to anticipate and/or co-construct an ironic layer within the interaction. Eyebrow raises by ironists mostly start before the irony, which is in line with previous studies on the timing of embodied behaviour in other contexts, arguing that bodily-visual actions mainly operate as early *facilitators of social action recognition* (Kaukomaa et al., 2013, 2014; Kendrick & Holler, 2017; Ter Bekke et al., 2020; Nota et al., 2021). On the other hand, the dataset only includes three eyebrow raises by ironists that start after the end of an ironic utterance, which is not in line with the prevalent use of gestural codas in González-Fuente et al. (2015).

A first limitation of the quantitative analysis is that the timing analysis only considers the starting point of the eyebrow movements, while it is also important to take their duration and end point into account. An eyebrow raise that starts before the start of an ironic utterance may stop before, during or after that utterance, which influences its possible interactional functions. Furthermore, the ironic utterances are considered independently of one another, thus not taking into account ironic sequences where the same participant may be the speaker of one ironic utterance as well as the addressee of another. The qualitative analyses, however, offer a more nuanced perspective on both the sequential and the interactional embedding of eyebrow raises in ironic interactions.

Regarding the sequential positioning of the eyebrow raises in relation to other bodily-visual resources, the qualitative analysis illustrates various constellations of the interactants' embodied actions. In Excerpt 1, the ironist is laughing while articulating the irony and at the very end of the ironic utterance, he also raises his right eyebrow and shifts his gaze direction. In Excerpt 2, one of the addressees smiles, shifts her gaze in the direction of the prospective ironist, and starts laughing, after which the other addressee starts laughing as well. The ironist then simultaneously raises her eyebrows, opens her mouth and shakes her head, followed by an ironic utterance during which the head shakes of the ironist and the laughter of the addressees' resume. In Excerpt 3, one of the addressees' laughter is followed by the prospective ironist smiling, tilting her head and shifting her gaze in the direction of that addressee. During the ironic utterance, the ironist then tilts her head and raises her eyebrows, after which the addressee immediately raises her eyebrows as well and starts laughing again. Finally, the beginning of Excerpt 4 includes raised eyebrows by all the interactants, which is followed by one of the addressees widening her eyes and tilting her head. The ironist then once again raises her eyebrows and shakes her head while articulating the irony. One of the interlocutors responds with another ironic utterance and tilts her head, followed by head nods and another eyebrow raise by the original ironist.

The qualitative analysis illustrates several interactional functions of raised eyebrows that are in line with previous research on the multimodal expression of irony. First, the dataset includes pre-irony eyebrow raises as an expression of surprise by both ironists and addressees (Excerpt 4) (cf. Ekman & Friesen, 1969; Ekman & Oster, 1979; Kaukomaa et al., 2015). As expected, raised eyebrows can also be used as an irony marker during the ironic utterance (Excerpt 3 and 4). While this is similar to Tabacaru and Lemmens' (2014) *gestural trigger* concept, we

emphasise that the raised eyebrows also contribute to the formation of the ironic layer in the first place, rather than primarily facilitating the recognition of that ironic intent. Additionally, raised eyebrows can also function as irony markers at the end of an utterance (Excerpt 1), which adheres to González-Fuente et al.'s (2015) gestural coda observations. Moreover, the eyebrow raise can simultaneously operate as a visual comprehension check to verify whether the addressees have understood the irony (Excerpt 1), which is in line with more precise gaze observations of ironic interactions using eye-tracking (Brône & Oben, 2022; de Vries et al., 2021).

In addition to these pre-acknowledged interactional functions, the qualitative analysis also reveals other uses of raised eyebrows *vis-à-vis* irony. Raised eyebrows by ironists can, for example, be part of a multimodal package that already establishes the ironic layer before the verbal irony (Excerpt 2). While previous research primarily focuses on bodily-visual markers of an ironic layer in the verbal conduct, embodied actions can thus also be ironic in their own regard, without a verbal manifestation of irony. Eyebrow raises by the addressees on the other hand, can interactionally function as an expression of understanding and agreement (Excerpt 3). Moreover, addressees can mirror the ironist's raised eyebrows (cf. multimodal alignment) in order to join the ironic layer within the interaction (Excerpt 3). Similarly, a pre-ironic multimodal alignment between the interlocutors can express an interactional willingness on the part of the addressees to join the speaker's stance, as part of a build-up towards an ironic utterance (Excerpt 4). On the one hand, interactants can join an ironic interactional layer after its establishment by the ironist, but, in some cases, the construction of irony itself thus simultaneously relies on the (bodily-visual) actions of a speaker and a joint action with their addressees. Raised eyebrows by addressees of an ironic utterance thus not only fulfil "prototypical" reactions such as surprise or agreement, but can also actively contribute to the establishment of the ironic layer itself and/or a joint ironic understanding of the interaction. This highlights the relevance of a sequential-interactional perspective on the multimodal dimension of irony, as the bodily-visual behaviour of an ironist cannot simply be separated from their interlocutors' embodied actions.

Our analyses based on spontaneous data show that Tabacaru and Lemmens' (2014) notion of eyebrow raises as a gestural trigger do not only occur *during* the ironically intended utterance, but can also occur before or after that utterance. Furthermore, this article shows that the multimodal dimension of irony extends beyond the perspective of the ironists themselves and the interactional function of signalling an ironic intent. Indicating (1) the multifunctional link between irony and eyebrow raises by both ironists and their addressees and (2) the possible co-construction of (joint) ironic interactional layers through the embodied actions of all of the interlocutors, this article thus illustrates the importance of adopting a sequential-interactional perspective on the multimodal dimension of irony. Avenues for further research in this respect include for example the multimodal dimension of irony in various interactional constellations and more precise timing measurements of bodily-visual actions by both ironists and their addressees.

Appendix

Table 1. GAT2 conventions for verbal transcription (Selting et al., 2009)

A: word [word B: [word	Overlap and simultaneous talk
A: word= B: =word	Fast, immediate continuation with a new turn or segment (latching)
°h	Audible inbreath of approximately 0.2-0.5 seconds
°hh	Audible inbreath of approximately 0.5-0.8 seconds
(.)	Micro estimated pause, up to 0.2 seconds
(-)	Short estimated pause, of about 0.2-0.5 seconds
((laughs))	Laughter
<<laughing> >	Laughter particles accompanying speech with indication of scope
<<all> >	Allegro, fast
:	Lengthening, by about 0.2-0.5 seconds
::	Lengthening, by about 0.5-0.8 seconds
:::	Lengthening, by about 0.8-1.0 seconds
OKAY you just do that	Focus accent
?	Pitch: rising to high
,	Pitch: rising to mid
-	Pitch: level
;	Pitch: falling to mid
.	Pitch: falling to low
da’	End-deletion (e.g. *da’* instead of *dat*)

Table 2. Conventions for multimodal transcription (Mondada, 2016)

felix	Identification of the participant doing the bodily-visual action with a lower case first letter
raised eyebrows	Descriptions of bodily-visual actions are delimited between two identical symbols and are synchronised with corresponding stretches of talk.
--> --->	The action described continues across subsequent lines until the same symbol is reached.
% %fig	The exact moment at which a screenshot was made is indicated with a specific symbol showing its position within the turn at talk.

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