The Foregrounding Assessment Matrix: An Interface for Qualitative-Quantitative Interdisciplinary Research

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Abstract – This paper presents the results of a transdisciplinary research conducted by scholars working in the humanities and experimental psychologists in order to find an interface between the needs of a qualitative approach (mainly based on the evaluation of stylistic features) and those of a quantitative analysis, in order to find useful features for testing different reading behaviors and for new hermeneutical enquiries. The results of our research, which was conducted in two Labs (Dahlem Institute for Neuroimaging of Emotion at the FU Berlin and the NewHums – Neurocognitive and Human Studies at the University of Catania), consistently differ from previous ones, as they focus on the whole multi-layered foregrounded texture of a poem and try to evaluate predictable differences in reading, re-reading behaviour and meaning-making processes.
We present the FAM, targeting foregrounding elements in three main categories: the phonological, morpho-syntactic, and rhetoric. To identify those elements, four different text levels were taken into account, the sublexical level of phonemes and syllables, the lexical level of single words, the interlexical level of word combinations across longer distance (e.g. two lines), and the supralexical level of whole stanzas or an entire poem. In contrast to previous quantitative analyses on short, isolated sentences and texts, mostly expository in nature ('textoids'), or on single words or segments, the text is considered as a whole, marked by density fields that work as milestones along a reading route.

Keywords – Qualitative and quantitative research; Literary criticism; Experimental psychology; Foregrounding; Density fields.

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1. Introduction

Combining qualitative and quantitative research has revealed to be very difficult because of basic methodological differences, the lack of useful tools to bridge disciplinary gaps and little agreement about basic requirements of the testing sets. So, for instance in the field of psychology and psycholinguistic, the quantitative research conducted on reading processes has focused on short, isolated sentences and texts, mostly expository in nature ('textoids') or single words or segments (Miall and Kuiken, "Foregrounding"; for overviews, see e.g. Traxler and Gernsbacher; Rayner and Pollatsek; Rayner), whereas qualitative research considers it impossible to disregard the unity of the text and to disrupt parts out of the context. If we aim to bridge different methodologies and approaches among the above-mentioned disciplines in a transdisciplinary qualitative-quantitative investigation about the reading response to literary texts, it is necessary to create new interfaces allowing to produce results at their crossway (see Vinci, Gambino and Pulvirenti).

In this sense, this paper will give an account of our transdisciplinary teamwork about reading poetry and will present part of the results of a pilot study on three Shakespearean sonnets: this qualitative-quantitative research draws back to previous studies about foregrounding (van Peer; Miall and Kuiken, "Foregrounding"; van Peer and Hakemulder), building on their results, with the difference that we do not investigate single segments of a poem (as already done in all previous studies on foregrounding), but its whole "texture" (Stockwell, "Texture") marked by what we name "density fields," i.e. "spots" of the text in which different kind of foregrounding (phonological, morpho-syntactic and rhetoric) unite, agglutinate and combine. By highlighting the density fields, the FAM brings the complex texture of a poem to light; this allows to make testable hypothesis about the interrelation among different foregroundings and among density fields throughout the whole poem (see for instance the features of "redundance" and "entanglement" in Gambino and Pulvirenti, *Storie, menti, mondi* 77-80). Final aim of this paper is to present an interface between the needs of a qualitative approach (mainly based on the evaluation of stylistic features) and those of a quantitative analysis, in order to find features useful for testing different reading behaviours and significant for new hermeneutical enquiries.

The results of our research consistently differ from previous ones (van Peer; Miall and Kuiken, "Foregrounding"; van Peer and Hakemulder), by focussing on the whole multi-layered foregrounded texture of a poem, and by trying to evaluate predictable differences in reading, re-reading behaviour and meaning making processes. The text is considered as a whole, marked by density fields that work as milestones along a reading route.

Therefore, the FAM is not a mere structural analysis, since it aims to highlight the elements of the text involved in the basic negotiation between form and function which influence the reader's behavioural, cognitive and emotional response (Sprang). This Matrix is useful for empirical research in the framework of the reader's response theory (e.g. Bleich; Fish; Iser), in order to quantify the results of the qualitative analysis and make them useful as predictors and as measurable elements of reader responses.

2. The Foregrounding Assessing Matrix

The FAM has been conceived as an interface tool between qualitative and quantitative analysis, targeting foregrounding elements in three main categories: the phonological, morpho-syntactic and rhetoric. To identify those elements, four different text levels were taken into account, the sublexical level of phonemes and syllables, the lexical level of single words, the interlexical level of word combinations across longer distance (e.g. two lines), and the supralexical level of whole stanzas or an entire poem (cf. Jacobs, "Neurocognitive poetics"). According to previous studies on foregrounding, stylistic features are "attractors" of the reader's eye and prompt specific cognitive, affective and aesthetic responses in readers (van Peer).

Shakespeare's sonnets are a milestone in world literature and belong to the most aesthetically, successful, and appreciated canonised literary works, surviving over many epochs and anthropological changes occurring in aesthetic taste and culture. Because of the powerful versification constructed on the stratification of stylistic figures, on thematic richness, symbolic imagery, and semantic associations, the sonnets have always had great impact on readers and they "have changed the world and the way our mind brains feel and think about it" (Jacobs, Schuster, Xue and Lüdtke 5). For these reasons they have been an ideal object of both qualitative and quantitative research, which have mainly been conducted in a disjunct way until now. Besides innumerable analytical approaches, and the widespread number of enquiries written by literary scholars (e.g. Vendler), all 154 sonnets have been the object of corpus analytical approaches: the first seminal quantitative narrative analysis study of Shakespeare's sonnets by Simonton stimulated further approaches using broader and deeper computational form and content analysis describing relevant properties for all of Shakespeare's 154 sonnets (Delmonte; Jacobs, Schuster, Xue and Lüdtke; Simonton). This is because they are ideal candidates for scientific studies on literary experience, especially within the tradition of reader response theory (Delmonte; Jacobs, "The scientific study of literary experience" and "The scientific study of literary experience and neuro-behavioral responses"). Shakespeare sonnets are a homogeneous corpus since most of them share the same strophic and metric structure, present a temporal sequence of events (mainly mental events), and relate these events to an individual perspective (Hühn). In contrast to the enormous variations in topics, moods, stylistic and rhetorical figures, Shakespearean sonnets follow a stable highly conventionalized metric and rhyme structure with only minor exceptions (sonnets 99, 126, and 145). Most of the sonnets consist of three isomorphic quatrains and a concluding couplet, with alternate end rhymes following the schema: abab cdcd efef gg; the 14 lines are decasyllabic iambic pentameters (except sonnets 99, 126, 145). A Shakespearean sonnet thus has a clear structural coherence, a logical development and maintains a unity of play.

Besides that, a Shakespearean sonnet unfolds itself in a "developing dynamic of thought and feeling marked by a unifying play of mind and language" (Vendler 5), while other aspects of content, language and rhetoric schemes and figures vary freely (Martindale 198). Their ambiguity and imaginative fertility, facilitated by their structural complexity, easily invite readers to reflect about their own feelings (Delmonte 87; Jacobs, Lüdtke, Aryani, Meyer-Sickendieck and Conrad 19-23). This makes them perfectly suited as stimulus material for cross-disciplinary neurocognitive poetics studies (Jacobs, Lüdtke, Aryani, Meyer-Sickendieck and Conrad 6).

3. Shakespeare's Sonnets 60, 27, and 66

As a first test case for the viability of the FAM we have chosen Shakespeare's sonnets 27, 60 and 66. In selecting these sonnets for our analysis, we first proceeded with a qualitative evaluation dividing the sonnet corpus into 24 main topics (cf. Simonton). We then excluded all sonnets indulging in stereotypes of Shakespeare's time: all those about not requited love or about absolute love; all those recurring to mythological characters; and all those about procreation as fulfilment of human existence. These latter aspects are usually felt by modern readers as less significant, too "difficult to understand," or too abstract. Out of the remaining large group of sonnets devoted to general 'evergreen' topics, common to much of European poetry, we chose those that, in our opinion, show different foregrounding features, with a potential for a sustained number of re-readings. During the stimulus selection process, we compared many different editions and comments of Shakespeare's sonnets (cf. Atkins), and finally chose the Quarto I sonnets of 1609 for the qualitative analysis, since experts assume that this edition was the original one published with the consent of the author, and provided amended spelling, orthography and punctuation for the tests in order to avoid any further distraction and difficulty for our contemporary readers.

The general hypothesis put forward in the experiment was based on the following premise: as the foregrounding features (FGs) (phonological, morpho-syntactic and rhetoric) identified at sublexical, lexical, interlexical, and supralexical levels overlap (cf. van Peer; van Peer and Hakemulder), they are not to be evaluated singularly, but in their giving rise to what we'd like to call "density fields." We consider density fields as one possible operationalisation for FGs, which is a central concept in theoretical works on stylistic features (cf. Miller), empirical studies of literary reading (e.g. Zyngier, Bortolussi, Chesnokova and Auracher), and in neurocognitive poetics (e.g. Jacobs, "Neurocognitive poetics" and "Towards a neurocognitive poetics model"). According to the *Neurocognitive Poetics Model* of literary reading/NCPM (cf. Jacobs, "Neurocognitive poetics" and "Towards a neurocognitive poetics model"), FGs are assumed to "facilitate aesthetic processes through attention capture, adaptation of schemata and situation models, construction of new meaning gestalts, self-reflection, or concernedness. These are assumed to correlate with a dysfluent reading mode (i.e., smaller eye movements, longer fixations), and significant neural activity in right hemispheric brain networks and the ancient play and lust circuits" (Jacobs, "Towards a neurocognitive poetics model" 10).

The FAM provides a mapping of the multiple layered FGs, specifically pointing out their overlapping and forming of a series of intensively foregrounded density fields, that should be considered as complex, continuous multidimensional variables structuring the tension and the trajectories of the reading act through the whole text, thus eliciting different kind of affective and aesthetic responses to the text. Density fields could be interpreted as macro attractors in stylistic terms, determining the "poetic function", which trigger feelings of beauty in Fechner's and Jakobson's conceptions (see Jacobs, "Neurocognitive poetics" 12), depending on the value (foregrounded at more or less levels) and distribution (evenly or with foci/hotspots) in the text.

4. Foregrounding

We started this pilot study by referring to existing research premises in the fields of poetic, rhetoric and linguistic analysis. Of central importance was Jakobson and Lévi-Strauss's (1962) systematic structuralist "pattern analysis" of Baudelair's poem *Les chats* in which the authors applied a formal metric, phonological, syntactic and semantic analysis, thus settling the ground for subsequent linguistic and cognitive poetics perspectives on the analysis and reception of literary texts (e.g. Leech, *A Linguistic Guide* and "New resources"; Stockwell, *Sociolinguistics*; Tsur; Turner and Pöppel).

We adopted Jurij Lotman's definition of the "poetic language" as a system of "second degree" in comparison to the "natural language," based on the peculiar relation instantiated by specific language features (Lotman 104). He regarded meaning and its ideological implications as relying on the poetic structure of the language: "The ideal content of a work is its structure." The "structural" features of a literary text, its specific "artistic model"—as it is constructed by the author—display the author's mental world and consequently his/her way of thinking about the world (Lotman 12). In his view, the formalized features are not just ornamental or persuasive elements, they are ambiguous and communicative at the same time (Lotman 66). The peculiar qualities of a literary text are emergent, context-dependent and complex. The reader does not disclose all various layers implied in a literary text, so that some of them remain undecoded, or, as Paulson says: "noisy" (Paulson). Following Lotman's distinction, the highly formalized poetic text drives the reader to the activation of unique and specific dynamic relations between all stylistic features, between content and form, in order to construct meaning. Therefore, poetry produces the semantization of elements by deviating or transforming phonological, syntactic or semantic features of ordinary language, making them ambiguous or differently meaningful at another level (146, 161). According to these premises, the poetic text is to be considered as a unified and integrated sign construction in which some features are foregrounded. In literary texts foregrounding is systematic and hierarchical and is meant to prompt *defamiliarization* (van Peer and Hakemulder).

The term foregrounding—presumably introduced by Garvin (1964) as an English translation of Mukařovský's Czech term *aktualisace* (cf. Leech, *A Linguistic Guide*)—appears closely linked to Rosenblatt's second level of text understanding (interpretation) in Leech's linguistic poetics theory. In linguistic terms, a figure which is foregrounded on the language background is picked out by a reader "as the most arresting and significant part of the message" and it is interpreted "by measuring it against the background of the expected pattern' (Leech, *A Linguistic Guide* 57). Foregrounding prompts, according to Miall and Kuiken, "defamiliarization" in the reader, i.e it provokes the deautomatization of the reading act. Defamiliarization evokes feelings, as shown in a study by Miall: when perception becomes deautomatized "a reader employs the feelings that have been evoked to find or to create a context in which the defamiliarized aspects of the story can be located" (Miall and Kuiken, "Foregrounding" 392). Therefore, foregrounding slows down the reading process, activating sensory-motor circuits (as for example demonstrated by Lacey, Stilla and Sathian) for reading textual metaphors and potentially prompting a more complex meaning-making process as well as stronger aesthetic pleasure (Miall and Kuiken, "Aspects"; van Peer and Hakemulder). The identification of FGs prompting specific forms of aesthetic responses is one of the main issues in studies of literary text reception which led to the development of the Neurocognitive Poetic Model (NCPM) and now of the FAM.

5. Foregrounding in the Neurocognitive Poetics Model (NCPM)

The central aim of the NCPM (Jacobs "Neurocognitive poetics" and "Towards a neurocognitive poetics model"; Nicklas and Jacobs) is to provide first testable assumptions about how literary texts elicit different reading routes and immersive as well as affective-aesthetic reader responses. To understand literary reading, three general factors have to be taken into account: text, context, and reader. Focussing on text, the NCPM describes two different reading routes which can be distinguished by processing of backgrounding and foregrounding elements, e.g. familiar words and style figures, respectively. It is assumed that foregrounding and backgrounding features stimulate differences in reading-related processes resulting in a variety of reader responses at three levels of inquiry (subjective-experiential, objective-behavioural and neuronal). All text features can be systematized in a 4x4 matrix resulting crossing four levels

of text (sublexical, lexical, interlexical and supralexical) with 4 groups of features (metric, phonological, morpho-syntactic and semantic) (Jacobs, "Neurocognitive poetics" 4).

To test assumptions of the NCPM, like the hypothesis that FGs facilitate aesthetic processes (Jacobs, "Neurocognitive poetics" 10), empirical research needs tools to access and quantify the foregrounding features. Tools from quantitative narrative analysis (QNA; e.g. Franzosi) cover different ways to operationalize, for example, narrative structures and complexity, like counting the type-token ratio or computing the measures of semantic similarities between words or pieces of texts (cf. Jacobs and Kinder, "The Brain" 141). Current empirical (neuro)cognitive poetics research on poetry reception primarily deals with (textual) structure analysis focusing on such quantifiable surface features like word frequency, sonority score or orthographic dissimilarity (e.g. Xue, Lüdtke, Sylvester and Jacobs).

Empirical work on foregrounding determined by stylistic figures is still underrepresented. We assume that this gap is a consequence of missing adequate tools and of the difficulties met by trying to mark all the stylistic features in a poetic text. Moreover, many different lexica of literary stylistics, such as Lausberg's handbook or the *The Oxford Dictionary of Literary Terms* (Baldick), do exist but empirical research pointed out the limited value of such dictionaries (Jacobs, "Neurocognitive poetics" 10), because clear and agreed taxonomic categories are still missing (McQuarrie and Mick 425).

The Abstractness Scale (Jacobs, Lüdtke and Meyer-Sickendiek 81), a 'semi-qualitative' tool for analysing FGs in poems, could be seen as a first step to develop a tool taking into account several structural and rhetorical features. Based on literary theory (Meyer-Sickendiek 14–48), it offers nine scales relevant for interpreting lyrical texts and judging the degree of defamiliarization. Unfortunately, the Abstractness Scale produces only a coarse holistic evaluation of an entire poem based on an expert evaluation of a limited number of features like rhyme scheme, metrics or the abstractness of mimesis (for application examples, see Jacobs, "Neurocognitive poetics" 10; Jacobs, Lüdtke and Meyer-Sickendiek 81; Jacobs, Lüdtke, Aryani, Meyer-Sickendieck and Conrad 90).

In this paper we propose a procedure to complement the abovementioned quantitative approaches with a qualitative one, focussing on a stylistic analysis comprising three FGs categories at four levels. As we will demonstrate, this offers the possibility to progress a phenomenological approach to poetry, i.e. the countless stylistic figures of a poetic text emerge and their interrelation becomes visible. By making the stylistic texture visible we open new possibilities to the study of the relation between form and content and between the stylistic texture and the reader's behaviour.

6. Foregrounding Assessment Matrix (FAM)

The texture of literary works goes beyond a conventional, causal and linear word-sign system; it instantiates complex multilayered reading dynamics in relation to specific foregrounding potentials and variously distributed density fields, which are in our opinion fundamental for the meaning-making process and the aesthetic appreciation of the text. The meaning making process and the literary quality of a text do not depend on single FGs, since it is the whole layered structure of the poem to drive the reader to activate unique and specific dynamic author-(con-)text-reader relations and the aesthetic response to the text. We assume that these relations could be (at least partially) studied and predicted by the results of a structured qualitative analysis and eye tracking tests, offering starting points for empirical testing. We would like to make clear that the FAM does not provide a scheme for the identification of all stylistic figures present in poetic texts, but tries to map density fields that act as good attractors in virtue of their multilayered stylistic features.

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	PHONOLOGICAL FOREGROUN-DING	MORPHO-SYNTAC-TIC FOREGROUN-DING	RHETORICAL FO-REGROUNDING
SUBLEXICAL LEVEL (phonemes, morphe-mes)	e.g. alliteration, asso-nance	e.g. parallelism through repetition of mor-phemes, prefix, suffix	---
LEXICAL LEVEL (lexemes)	e.g. anaphora of one lexem, ploce	e.g. morphological paral-lelism, prepositions, conjunctions	e.g. one word meta-phors or symbol, ox-ymoron in com-pound words
INTERLEXICAL LEVEL (two or more lexemes in one or more lines)	e.g. anaphora of two lexemes, epimone	e.g. parallelism of syn-tactic structures, paren-thetical clause, enjambement	e.g. tropes as meta-phor, symbol
SUPRALEXICAL LEVEL (stanza or bigger units)	e.g. rhyme schemes, lipogram	e.g. forms of syntactic parallelism	e.g. tropes developed in one or more stan-zas

Tab. 1 – FAM. The following table schematically presents the FGs mapped in the analysed sonnets, providing a basic example for further studies. Note: For identification of our example terms, we have adopted the definitions by Baldick (*The Oxford Dictionary of Literary Terms*).

We do not pretend to give account of all possible stylistic features in the poems, which are definitely countless, as evidenced in many dictionaries and companion books to poetry. Our aim is to let the texture of the texts become evident through the FAM; this in order to allow other scholars to enrich it with further figures that can be identified at the different levels.

In our pilot study, the three selected Shakespearean sonnets, despite their similar rhyme scheme, reveal very different FG textures. Their highly foregrounded fields stand out against the background[1] (Gambino and Pulvirenti, *Storie, menti, mondi* 95-100; "Neurohermeneutics"; "The Neurohermeneutics of Suspicion") and can be considered as clues for slowing down the reading process.

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[1] Much less research has been devoted to the role of background features of literary texts, i.e. what Iser called the "repertoire" of a text. We claim that focussing on foregrounding features takes into account the background, because the identification of the foregroundings results out of the relation among con-trastive elements. Only with regard to the "repertoire" of a text it is possible to assess textual features "defamiliarizing" the "base-line" either at linguistic, rhetoric and semantic level or at logical level with regard to the textual coherence and to the respect of the vital relations (time, space, entity, causation, and motivation) (Graesser and Zwaan).

7. Running the FAM to Sonnets 27, 60, and 66

To show how the FAM can be used to reveal the texture of a poem, we will apply it to Shakespeare's sonnets 27, 60, and 66. Following Jacobs, Schuster, Xue and Lüdtke's extensive quantitative narrative analysis (QNA) of all 154 Shakespeare sonnets, in the present analysis of sonnets 27, 60 and 66, we simplify things by neglecting the metric level because it is the same across the three sonnets, becoming a background feature.

The FGs identified by application of the FAM in the three sonnets are described in Tables 2-4.[2] The results are visualized in Figure 1 in which we indicated the FGs using one colour for each FG category: yellow lines indicate the phonological FGs, red lines mark the for morpho-syntactic FGs, and green lines show the rhetorical FGs. This visualisation is also the starting point for two ways of quantification described later on.

7.1. Sonnet 27

In sonnet 27 (see tab. 2, p. 269) the phonological foregrounding at sublexical level is mainly based on alliterations and on the emphatic repetition of words (ploces), while at lexical level it bases on assonances and internal rhymes. Interestingly enough, these features rarely overlap with the morpho-syntactic FGs, which are concentrated in the couplet tie, whereas the double syntactic parallelism prevails at the lexical level. The first syntactic parallelism is built on the structure given by the following syntagmatic sequence: temporal adverb + adjective + noun; the second parallelism is built on: preposition + pronoun. Examining the distribution of rhetorical FGs, the number of oxymora is salient (occurring 6 times within 14 lines, see table 2). The whole sonnet is built on the tension created by the contrasting images of the oxymora, sustained by the interplay between the pronouns I (my-myself) and thy (thee).

The FGs are quite evenly distributed all over the poem and are less frequently overlapping than in sonnet 60, as we will see. This means that density fields are less evident and, going back to Stockwell's metaphor of a poem intended like a fabric, they form a quite even texture. Because of such evenly distributed FGs, general comprehension should be easier (less defamiliarization potential), but the aesthetic appreciation should be less intense (in comparison to the other two sonnets).

7.2. Sonnet 60

According to the FAM-based analysis, sonnet 60 shows more evident density fields (see tab. 3, p. 270) . We therefore assume that this sonnet turns out to be an ideal candidate to test the influence of density fields on reader's response. Along with sonnet 73, this is considered a perfect example of Shakespearean sonnet form, and it is one of the most known, frequently recited and set to music[3]. From a qualitative point of view, sonnet 60 shows one of the most complex and accentuated stylistic foregrounding structures of the whole corpus: an interesting overlapping of phonological, morpho-syntactic and rhetorical FGs at different levels forming evident density fields (see Fig. 1. Density fields are those FGs with more underlining, possibly in all the three colours). The density fields create a sort of guided path to the strongly imaginative and emotionally evocative features of the text, producing intense aesthetical appraisal in the reader.

[2] We are aware of the fact that–depending on which style figures' taxonomy or list is used (e.g. Lausberg; Leech, *A Linguistic Guide*; McQuarrie and Mick; Schrott and Jacobs)–other FGs could be analysed and counted. We thus make no claims about the exhaustiveness or general validity of the present proposals in Table 2–4: they simply serve as example applications, hopefully stimulating future discussions and extensions.

[3] See http://www.robertwilson.com/shakespeares-sonnets.

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	PHONOLOGICAL FOREGROUN-DING	MORPHO-SYN-TACTIC FOREGROUN-DING	RHETORICAL FOREGROUN-DING
SUB-LEXI-CAL LEVEL	**Alliteration**: /w/ line 1;/ /m/ line 1; /t/ line 2; /m/ line 4; /f/ line 5, /ai/ line 5 **Assonance**: /ee/ lines 6-8; /ight-/ lines 9-13, /y/ line 13	---	---
LEXICAL LEVEL	**Ploce**: /work/ line 4; /ight/ lines 10-13; /by/ line 13; /my/ line 13; /for/ line 14 **Internal Rhyme**: /thy-my/ line 10 **Assonance**: /droop-ing/looking/ lines 7-8; /night/mind/ line 13	**Personal pronoun foregrounding**: I-me-my-myself /thy-thee **antanaclasis**: /work/ line 4	---
INTER-LE-XICAL LEVEL	---	**Parallelism (temp.adv. + adj.noun)**: /by day my limbs/ by night my mind/ line 13 **Parallelism (prep.+ pron.)**: /For thee and for myself/ line 14	**Zeugma**: begins a journey/ to work my mind, lines 3-4; Makes black night beauteous, and her old face new, line 12; my limbs, my mind, for thee, for myself, no quiet find, lines 13-14 **Simile**: thy shadow- like a jewel, lines 10-11 **Metaphor**: journey in my head, line 3; zealous pilgrimage, line 6; soul's imaginary sight, line 9 **Personification**: dear repose, line 2; limbs with travel tired, line 2; begins a journey in my head/to work my mind line 3,4; my thoughts intend a zealous pilgrim-age to thee, lines 5, 6; thoughts keep, lines 5, 7; sight-present, lines 9, 10; sightless view makes, lines 10,12; my limbs … no quiet find, lines 13, 14; my mind…no quiet find, line 13, 14; **Oxymoron**: my drooping eyelids open wide. line 7; Looking on darkness; the blind do see line 8; my sightless view, line 10; black night beauteous; old face new, line 12
SUPRA-LE-XICAL LEVEL	---	---	---

Tab. 2 – Results of the systematic application of the FAM to sonnet 27.

	PHONOLOGICAL FOREGROUN-DING	MORPHO-SYNTAC-TIC FOREGROUNDING	RHETORICAL FORE-GROUNDING
SUB-LEXI-CAL LEVEL	**Alliteration:** /th/ line 3; /ch/ line 3; /cr/ lines 6-7; /b/ line 10; /-and/ lines 12-13 **Assonance:** /waves/make/ line 1; /shall/stand/ line 13	**Prep./suffix denoting spacial direction:** -wards towards/to/forwards) lines 1,4.	
LEXICAL LEVEL	**Anaphors:** And, lines 8-10-12-13 **Ploce:** time, lines 8,9,13; doth, lines 8-9; stand, lines 12-13		**Symbol**: Time=life, line 8; scythe=death, line 12
INTER-LEXI-CAL LEVEL		**Syntactic Parallelism: noun+verb+prep (di-rection)** (waves make towards/minutes has-ten to) lines 1-2. **Comparative clause (equivalence):** (Like as /so do) lines 1-2.	**Sinecdoche:** waves/ minutes, lines 1-2. **Metaphors:** main of light, line 5; maturity, line 6; glory, line 7; crooked eclipses, line 7; his gift, line 8; flourish set on youth, lines 9; delves the parallells in beauty's brow, line 10; nature's truth, line 11 **Metonimy:** my verse, line 13; his cruel hand, line 14. **Personification:** waves make, line 1; minutes hasten, line 2; minutes contend line 2, 4; nativity crawls to maturity, line 6; maturity crowned, line 6; crooked eclipses, line 7; eclipses fight, line 7; Time gave, line 8; Time con-found, line 8; Time transfix, line 9, Time delves, lines 9, 10; Time feeds, lines 9, 11; nothing stands, line 12; scythe to mow, line 12; verse shall stand, line 13; verse praising, line 14.
SUPRA-LEXI-CAL LEVEL		**Parenthetical clause:** once in the main of light/wherewith being crown'd, lines 5-6 **Enjambement:** Nativ-ity/crawls, lines 6-7; Time/Feeds, lines 9-11; my verse/praising, lines 13-14	**Simile**: Like as /So do, lines 1-2.

Tab. 3 – Results of the systematic application of the FAM to sonnet 60.

According to the FAM-based analysis, sonnet 60 shows more evident density fields. We therefore assume that this sonnet turns out to be an ideal candidate to test the influence of density fields on reader's response. Along with sonnet 73, this is considered a perfect example of Shakespearean sonnet form, and it is one of the most known, frequently recited and set to music[4]. From a qualitative point of view, sonnet 60 shows one of the most complex and accentuated stylistic foregrounding structures of the whole corpus: an interesting overlapping of phonological, morpho-syntactic and rhetorical FGs at different levels forming evident density fields (see Fig. 1. Density fields are those FGs with more underlining, possibly in all the three colours). The density fields create a sort of guided path to the strongly imaginative and emotionally evocative features of the text, producing intense aesthetical appraisal in the reader.

7.3. Sonnet 66

In sonnet 66 phonological, morpho-syntactic and rhetorical FGs at all text levels are very diffused and without substantial overlapping (see tab. 4, p. 265). This sonnet is characterized by elements of repetition within morpho-syntactic FGs, determining a quite homogeneous poetic texture forming fewer density fields. From a qualitative point of view this determines a nearly mechanical and repeated contraposition of "good and evil", which should evoke a weaker aesthetic appreciation.

Based on the FAM, in Figure 1 we visualize all FGs identified in the three sonnets with different colours. Each line contains several FGs at different levels and in different categories, as described in Tables 2-4. So, for example, the yellow underlining of "Weary with" (sonnet 27, line 1) marks within the phonological category the alliteration /w/ at sublexical level, while in sonnet 60, the green underlining of "waves" (line 1) and "minutes" (line 2) marks the synecdoche at interlexical level.

Underlining all the detected FGs within the sonnets allowed us to identify density fields: e.g. in sonnet 27 at line 4: "work my mind" is marked as FG in all three categories and at all levels. Another evident density field can be seen at line 2 in sonnet 60: "minutes haste," which pops out due to the number of green and red underlinings.

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	PHONOLOGICAL FOREGROUN-DING	MORPHO-SYNTACTIC FOREGROUNDING	RHETORIC FORE-GROUNDING
SUB-LEXI-CAL LEVEL	**Alliteration**: /b/ line 2; /n/ line 3; /t/ line 9; /th/ line 13; /l/ line 14 *Polyptoton:* simpl-, line 11; capt-, line 12	**Parallelism: prefix with negative function** un-happily, line 4; for-sworn, line 4; mis-placed, line 5; strum-peted, line 6; dis-graced, line 7; dis-abled, line 8 **Parallelism: suffix –ly transforming adjective into adverb** unhappily, line 4; shamefully, line 5; rudely, line 6; wrong-fully, line 7	
LEXICAL LEVEL	**Assonance:** nothing/jollity, line 3; doctor-like/control-ling, line 10; love/alone, line 14 **Anaphora:** And, lines 3-12 **Consonance**: leave/love, line 14	**Parallelism: compound words** tongue-tied/doctor-like, lines 9, 10	**Antithesis**: right/wrongfully, line 7
INTER-LE-XICAL LEVEL	**Anaphora**: Tired with all these, lines 1, 13	**Parallelism of syntactic structure: nounphrase+comple-ment+subject+verb** "Tired with all these, for restful death I cry"/ "Tired with all these, from these would I be gone", lines 1, 13 **Parallelism of syntactic structure: conjunction+(ad-ject)noun+adverb+verb past participle** " And purest faith unhappily forsworn" / "And guilded honour shamefully mis-placed"/ "And maiden virtue rudely strumpeted"/ "And right perfection wrongfully dis-graced"/ "And strength by limping sway disabled", lines 4, 5, 6, 7, 8	**Hyperbole**: for restful death I cry, line 1 **Personification**: noth-ing/faith/honour/vir-tue/perfec-tion/strength/art/skill/truth/good, lines 3-12 **Antithesis**: clauses with opposite meaning, lines 3-12
SUPRA-LE-XICAL LEVEL		**Anaphora framing**: "Tired with all these", lines 1,13 **Morpho-syntactic fore-grounding - parallelism** lines 4-8	**Anthitesis** antithetic clauses and personifications, lines 3-12

Tab. 4 – Results of the systematic application of the FAM to sonnet 66.

27

Weary with toil, I haste me to my bed,
The dear repose for limbs with travel tired;
But then begins a journey in my head
To work my mind, when body's work's expired:
For then my thoughts — from far where I abide —
Intend a zealous pilgrimage to thee,
And keep my drooping eyelids open wide,
Looking on darkness which the blind do see:
Save that my soul's imaginary sight
Presents thy shadow to my sightless view,
Which, like a jewel hung in ghastly night,
Makes black night beauteous, and her old face new
Lo! thus, by day my limbs, by night my mind,
For thee, and for myself, no quiet find.

60

Like as the waves make towards the pebbled shore,
So do our minutes hasten to their end;
Each changing place with that which goes before,
In sequent toil all forwards do contend.
Nativity, once in the main of light,
Crawls to maturity, wherewith being crown'd,
Crooked eclipses 'gainst his glory fight,
And Time that gave doth now his gift confound.
Time doth transfix the flourish set on youth
And delves the parallels in beauty's brow,
Feeds on the rarities of nature's truth,
And nothing stands but for his scythe to mow:
And yet to times in hope my verse shall stand,
Praising thy worth, despite his cruel hand.

66

Tired with all these, for restful death I cry,
As, to behold desert a beggar born,
And needy nothing trimm'd in jollity,
And purest faith unhappily forsworn,
And guilded honour shamefully misplaced,
And maiden virtue rudely strumpeted,
And right perfection wrongfully disgraced,
And strength by limping sway disabled,
And art made tongue-tied by authority,
And folly doctor-like controlling skill,
And simple truth miscall'd simplicity,
And captive good attending captain ill:
Tired with all these, from these would I be gone,
Save that, to die, I leave my love alone.

line rhyme

1 a
2 b
3 a
4 b
5 c
6 d
7 c
8 d
9 e
10 f
11 e
12 f
13 g
14 g

Fig. 1 – Overview of all FGs described in Tables 2-4. The phonological FGs are marked with yellow underlining, morpho-syntactic ones with red underlining and rhetorical FGs with green underlining.

8. FAM-based predictions about reader responses

Running the FAM on sonnets 27, 60 and 66 made it possible to formulate following hypotheses about overall reader responses.

sonnet 27 is dominated by a simple and unified structure, with less evident density fields. The foregrounded features do not overlap, therefore we find a less irregular texture. The rhetorical structure is mainly based on the effect of contrast produced by the presence of oxymora. The relevant FGs of sonnet 27 converge towards the main topic of the "journey in the head," a metaphor which is strengthened by the word "pilgrimage" (6), reinforcing the motif of the "movement of the thoughts" towards the beloved. This physical and metaphorical movement is further amplified and contrasted by the oxymoronic image of a "motionless journey" of the mind (1-6) and by that of a "sightless view" (7-10). In verse (7) the motif of the sight is introduced as consequence, reinforced by "drooping eyelids," which expresses a further bodily sensation appealing to the immersion of the reader. According to its easier and more repetitive rhetorical structure based on oxymora stabilizing the readers' attention through the iterative effect of contrast, and the clear defined semantic metaphorical field of the journey, we assume that sonnet 27 will effectively present less difficulties in comprehension and will be aesthetically praised as slightly less rewarding than sonnet 60.

In sonnet 66, the density fields are provided by different forms of repetition crossing all levels, e.g. iteration and parallelism of phonological and morpho-syntactic FGs in the central part of the poem at sublexical, lexical, interlexical and supra-lexical level. As phonological FGs there are many alliterations (/b/ 2; /n, ŋ/ 3; /t/ 9); iterations (simpl- 11; capt- 12) and anaphoras ("Tired with all these" 1 and 13). More evident are: the use of the anaphora "And" running 10 times throughout the whole composition (3-12), and the number of assonances (nothing: jollity, 3; doctor-like:controlling, 10; love:alone, 14; the consonance leave:love,14). The most relevant morpho-syntactic FGs are five different types of parallelism:

1) at the sublexical level made by prefix with negative function (un-happily, 4; for-sworn, 4; mis-placed, 5; strum-peted, 6; dis-graced, 7; dis-abled, 8);
2) at the sublexical level by the use of the suffix "-ly", changing an adjective into adverb (unhappi-ly, 4; shameful-ly, 5; rude-ly, 6; wrongful-ly, 7);
3) at the lexical level by the use of compound words (tongue-tied/doctor-like, 9, 10);
4) at the interlexical level by the syntactic parallelisms of noun phrase + complement + subject + verb (1 and 13);
5) at the interlexical level by the syntactic parallelism created by the succession of conjunction + eventually adjective noun + adverb + verb in past participle (4, 5, 6, 7, 8).

All these different repetitions do not give rise to clearly defined density fields, because they are quite evenly distributed throughout the sonnet. This probably brings the readers' attention to hesitate, prompting re-reading and the meaning making process becomes more difficult, because of the lack of specific hints or reading trajectories. sonnet 66 does not present many rhetoric figures, so for instance there is no evident use of metaphors, which normally prompt the construction of further mental images in readers, a process bound to aesthetic arousal. Therefore, on the basis of our qualitative analysis, we assume that sonnet 66 will be evaluated as the most difficult to understand and the least liked or aesthetically appreciated (compared to both sonnets 27 and 60).

sonnet 60 shows more defined density fields, with a particular evidence of the one in lines 8-9, since it builds the semantic climax of the sonnet attesting the main topic: *time*. It also develops the main topic by linking it directly or indirectly to other semantic FGs in the text and by building the main meaning-making chain throughout the text: "time" appears to be the semantic core (or hub-word) of the whole stylistic texture. *Time* is the centre of gravity of the

semantic FGs being related to two similes, one synecdoche, seven metaphors in total, two metonymies and 13 personifications; it thus represents the absolute key word of the text. *Time* is also underlined as phonological FG at supralexical level because it is linked with an *enjambement*, marking a particularly "dense" field of the sonnet. Therefore we assume that sonnet 60 will be evaluated as difficult to understand but as the most aesthetically appreciated.

To test our predictions we collected data from native readers, fifteen native English participants in Berlin (five female and ten male, mean age: 31.5 years, from 18 to 68 years), and fifteen native English participants in Catania (nine female, six male, mean age: 34.5, from 20 - 58 years). All participants were invited to our labs to read the three sonnets in randomized order. After the initial reading of each sonnet they answered a paper-and-pencil memory test accompanied by several rating questions, including ratings for understanding and aesthetic appreciation. Here, the participants indicated on five-point rating scales how much they agreed to statements like "I like this poem" or "This poem is easy to understand" (higher values indicating stronger agreement). The participants were also asked to mark the most important words within each sonnet. For each single word within each sonnet we counted the frequency of marking, i.e. the number of participants who marked that word. For example, the word 'mind' in sonnet 27 (line 13) was marked by seven persons from the Berlin cohort and also by seven persons from the Catania cohort. In the next step, we tested the accordance of the markings from both the Berlin and the Catania cohort. The markings of both cohorts correlated to $r = .71$ in sonnet 27, $r = .72$ in sonnet 60 and $r = .59$ in sonnet 66. This means that both cohorts consistently marked the same words as important within each sonnet. For all further analyses, we therefore report the results for both cohorts together.

9. Results for understanding and appreciation

Regarding our prediction that sonnet 27 is easier to understand than sonnet 60, but aesthetically less appreciated, and sonnet 66 is more difficult to understand and less appreciated, we used the self-reported values for liking and understanding. First, we calculated the mean values for each of the three sonnets and compared them with paired Student's tests. As depicted in Figure 2, the mean appreciation ratings for sonnet 27 and 60 are statistically equal ($M_{27} = 4.07$, $M_{60} = 4.0$). sonnet 66 significantly is the least liked one ($M_{66} = 2.97$).[5] The data for comprehension ratings are different: There is a clear trend sonnet 27 >= sonnet 60 > sonnet 66 ($M_{27} = 3.73$, $M_{60} = 3.48$, $M_{66} = 2.9$) indicating a progressive decline in understanding. However, the results of paired t-tests indicated a significant difference only for the contrast between sonnets 27 and 66.[6]

[5] Results of paired Student's tests for self-reported Liking [sonnet 27 vs. 60: $t(29) < 1$; sonnet 27 vs. 66: $t(29) = 5.18$, $p < .001$, $d_{pooled\ variance} = 1.06$; sonnet 60 vs. 66: $t(29) = 4.87$, $p < .001$, $d_{pooled\ variance} = 0.91$].
[6] Results of paired Student's tests for self-reported Understanding [sonnet 27 vs. 60: $t(29) = 1.06$, $p = .29$, $d_{pooled\ variance} = 0.23$; sonnet 27 vs. 66: $t(29) = 3.31$, $p = .002$, $d_{pooled\ variance} = 0.64$; sonnet 60 vs. 66: $t(29) = 2.25$, $p = .028$, $d_{pooled\ variance} = 0.48$].
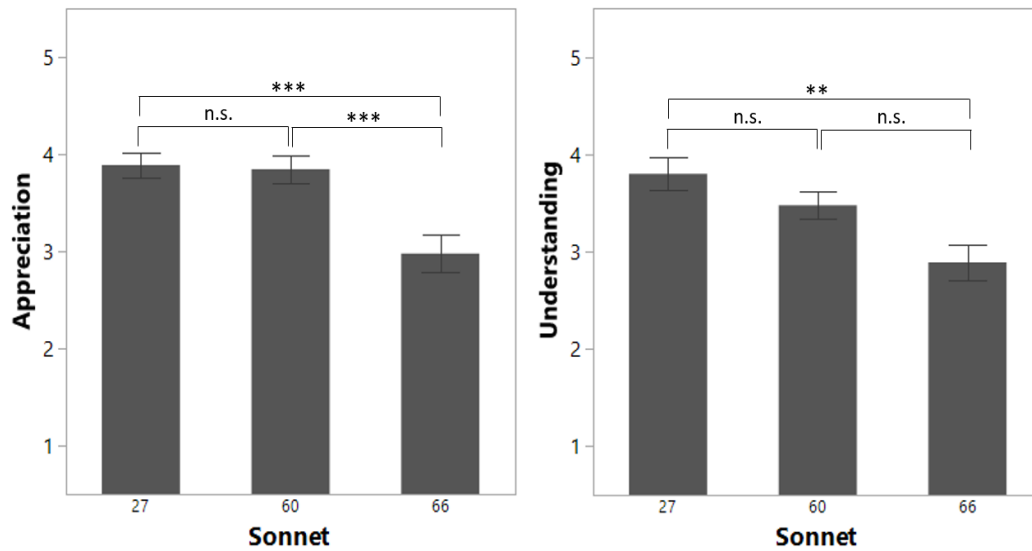
Fig. 2 – Mean Appreciation (left) and Understanding ratings (right) for sonnets 27, 60 and 66 together with results of paired t-tests (indicated by the brackets above the bars). Notes: *** indicates a significant difference with p<.001; ** indicates a significant difference with p<.01; n.s. indicates no significant difference. The error bars are constructed using one standard error from the mean.

Taken together, reader responses for understanding and aesthetic appreciation for sonnet 27 and 60 seem to be relatively similar, whereas the ratings for sonnet 66 clearly differ. The latter result is completely in line with our hypothesis, while the lack of significant differences in the results about understanding and aesthetic appreciation between sonnets 27 and 60 goes against our assumptions. In fact, there is a numerical difference in the understanding ratings between sonnet 27 and 66, which corresponds with our assumption that sonnet 27 is easier to understand than sonnet 60. But this difference is not statistically significant. The application of the FAM indicates that the fewer density fields present in sonnet 27 are directly pointing to the relevant text passages making it relatively easy to understand. This is in line with our data. That sonnet 60 is rated more or less as understandable as sonnet 27 was not expected. Future research is necessary to test whether this might be a result of the higher number of clear density fields identified in sonnet 60. The other unexpected result is the missing difference in aesthetic appreciation between sonnets 27 and 60. Due to the clear complex and accentuated stylistic foregrounding structures identified in sonnet 60 we assumed slightly higher appreciation for this sonnet compared to 27, a difference we could not observe in our data. Empirical studies about aesthetic experiences especially from the field of art appreciation suggested that the appreciation of paintings or objects is influenced by many underlying factors, like ease of processing (cf. Reber), prototypicality (cf. Martindale and Moore) or frequency of exposure (cf. Zajonc). We assume the same for poetic texts. So again, future studies are necessary to develop multicomponent models about the appreciation of poetic texts, like that from Leder about art appreciation (e.g. Leder and Nadal).

10. Perspectives on FAM applications in neurocognitive poetics research

We think that the FAM provides a promising framework for future (neuro)cognitive poetics research regarding the role of FGs and density fields in reader response to poetic texts. Since the NCPM makes assumptions about the effect of foregrounding on readers' behaviour, a tool was missing that enables identification of the general texture produced by FGs based on stylistic analysis. The FAM is a solution to operationalize FGs in poetic texts as a whole and thus a first step in the qualitative prediction of reader response to poetry. Apart from the fact that the FAM's potential is exemplified by a single-case study on three contrastive sonnets, it provides a scheme to detect significant FGs and their interrelation within the text in order to let the texture emerge and allow to predict aspects of reader responses. The FAM can serve for comparisons of two or more poems – e.g. identification of poems with more and less density fields and their distribution within the text and the resulting consequences for the reading behaviour. A more fine-grained comparison by density field identification helps to distinguish between 'subgroups' of poems, e.g. poems with more FGs and clear density fields (like sonnet 60) compared to poems with less clear density field boundaries (like sonnet 66). Therefore, research on density fields promises fruitful insights into the relation between form and content and between reader response and density fields potentials investigated in neurocognitive poetics research by multimethod measurements. We assume that marking density fields in poems allows a promising continuation of empirical research using direct online measures, where participants perform liking decisions, for example, by text marking while reading (cf. Jacobs, Hofmann and Kinder), direct offline measures regarding e.g. questions of mental imagery (cfr. Magyari, Mangen, Kuzmičová, Jacobs and Lüdtke), indirect offline questions assuming e.g. (better) memory for foregrounded elements (cf. van Peer), and indirect online methods measuring e.g. eye movement changes between density fields and background. In that direction, Fechino et al. reported particular distributions of rereading behaviour while reading poetry (cf. Müller, Geyer, Günther, Kacian and Pierides; Xue, Lüdtke, Sylvester and Jacobs), and Miall and Kuiken did attempt to examine transitions in foregrounding (Miall and Kuiken, "Aspects").

11. Methodological considerations regarding quantitative FAM applications

To conduct studies in the framework of neurocognitive poetics using quantitative measures in eye tracking or neuroimaging studies, qualitative data need to be converted into quantitative data (i.e., numbers), that allow parametric predictions based on FGs and density fields. For this conversion, we propose a counting procedure of stylistic figures starting with the lexem/word unit, typically preferred in psycholinguistics (e.g. Carrol and Conklin) and Neurocognitive Poetics (e.g. Jacobs, "Quantifying the Beauty"; Jacobs and Kinder, "The Brain" and "What makes a metaphor literary?"; Jacobs, Hofmann and Kinder; Jacobs, Schuster, Xue and Lüdtke; Xue, Lüdtke, Sylvester and Jacobs). In narrative and content analysis, word-based algorithms are also frequent (cfr. Franzosi; Franzosi and Vicari). For the future development of an algorithm able to quantify the number of stylistic figures in poetry, one first has to clarify how to compute a foregrounding value for each single word in a poem.

There are at least two ways to produce a foregrounding value for each word, we will call them *integer* and *fraction* method. Both methods will be illustrated analysing FGs of the word 'Time' in line 9 from sonnet 60: 'Time' is part of four stylistic figures (ploce, enjambement, and two personifications). Using the integer method means just to count the number of

stylistic features a word belongs to. So 'Time' would get the overall value of 4. Integer method means that each stylistic figure gets the same waiting, independent of whether it is related to two words, like the personification of 'time' in sonnet 60 (line 9), or to ten words like the repetition of 'And' in sonnet 66. Using the fraction methods is a way to weight the value for each stylistic figure according to the number of words associated with it. Using the fraction method, the word 'Time' (sonnet 60, line 9) is valued as follows: the word 'Time' is a ploce recurring three times. It would therefore count as 1/3=0.33. The *enjambement* involves three words ('Time', 'delves', 'feeds'), so it would also be counted as 1/3=0.33 Both personifications involve two words and would count as 1/2=0.5. The final fraction sum over all FGs from all three categories is thus 1.66. What are the consequences of using either methods? Using the integer method seems to be much easier but it bears the risk to overvalue stylistic figures involving many words, e.g. figures at the interlexical level. In contrast, using fraction methods is more sensible for the size of a stylistic figure, but it seems to be more complicated. We used both the integer and the fraction method to calculate the values for each word in each sonnet. We will present the data separately for each of the three foregrounding categories. An example is reported in Table 5. As mentioned, the word 'Time' (sonnet 60, line 9) is part of one phonological, one morpho-syntactic and two rhetorical figures. The absolute counting used for the integer methods provides the values 1, 1, and 2. The waiting used for the fraction method leads to the values 0.33, 0.33 and 1.

	PHONOLOGI-CAL FORE-GROUNDING		MORPHO-SYN-TACTIC FORE-GROUNDING		RHETORICAL FOREGROUN-DING		number of participants who underlined that word as important*
	integer	fraction	integer	fraction	integer	fraction	
'mind' (27, line 13)	1	0.5	1	.125	2	.291	14
'Time' (60, line 9)	1	0.33	1	0.33	2	1	6
'jollity' (66, line 3)	1	0.5	0	0	1	0.167	3

Tab. 5 – Integer and Fraction Values for three example words from sonnets 27, 60, 66 and relative frequency of keyword marking. Note *: In total we measured readers' responses of 30 participants.

12. Application of FAM-based quantification

One application of the described quantifications based on FAM is to use these values to predict the responses of the readers. Let's give an example. As reported, the participants in our pilot study read all three sonnets (27, 60 and 66). After reading they answered a paper-and-pencil memory test accompanied by several rating questions and marking tasks. One task of the readers was to mark the most important words within each sonnet. Counting the number of readers who underlined a word produced also a value for each word in each sonnet. The

example word 'Time' (sonnet 60, line 9) was underlined by 6 readers, the word 'mind' (sonnet 27, line 13) was underlined by 14 readers, whereas the word 'jollity' (sonnet 66, line 3) was underlined by only 3 readers. We can now calculate the accordance of both quantification methods (integer and fraction) with the participants' markings indicating the most important words. Table 6 reports the correlation between the marking frequencies and the numbers computed by the integer and fraction methods.

quantification sonnet method	PHONOLOGICAL FOREGROUN- DING		MORPHO-SYNTACTIC FOREGROUNDING		RHETORICAL FO- REGROUNDING	
	integer	fraction	integer	fraction	integer	fraction
27 *r* KI	.12 (-.07 - .30)	.08 (-.10 - .27)	.12 (-.07-.30)	.11 (-.08 - .29)	**.65** *** (.53 - .74)	**.54** *** (.39 - .66)
60 *r* KI	-.11 (-.29 - .08)	-.10 (-.28 - .09)	.04 (-.15 - .23)	.15 (-.04 - .33)	**.39** *** (.21 - .54)	**.37** *** (.20 - .52)
66 *r* KI	-.15 (-.34 - .06)	-.06 (-.26 - .15)	**.28*** (.07 - .46)	**.33*** (.13 - .50)	-.13 (-.32 - .08)	-.04 (-.24 - .17)

Tab. 6 – Correlation FAM quantification of stylistic figures and participants' markings of most important words. Note: *r* = Pearson correlation, *KI* = confidence interval,* = significant correlation with *p*<.05, ** = significant correlation with p<.01, *** = significant correlation with *p*<.001. All other correlations are not significant.

For a better picture we calculated the correlations separately for each foregrounding category and for each sonnet. Comparing the correlations between readers' marking frequencies with the integer values with the correlations between readers' marking frequencies with fraction values shows a slight advantage for the integer method which yielded for almost all cases higher correlations coefficients. The more complicated fraction method considering the number of words constituting a stylistic figure does not result in a remarkable advantage. Rather it seems that the easier integer methods should be preferred.

Independently of that small difference between integer and fraction method, the overall picture is the same. There are substantial differences in the correlations between sonnets and foregrounding categories. For sonnets 27 and 60 we observed significant positive correlations only for rhetorical FGs. When marking the most important words, our readers seemed to focus more strongly on rhetorical figures. The higher the number of rhetorical figures a word belongs to, the higher was the number of readers that underlined that word. In contrast, no systematic relationship could be observed for the other two categories of foregrounding. Further studies should test how rhetorical features stipulate the meaning making process, for example by initializing further and rich subjective imagery which might be correlated with higher aesthetic arousal and appreciation.

For sonnet 66 we observed no significant presence of rhetorical figures, which in the other sonnets stimulated the meaning making process. Instead, the morpho-syntactic figures were the best predictor for the marking behaviour of our readers. Again, we observed a significant positive relationship: the higher the number of morpho-syntactic figures a word belongs to, the higher was the number of participants underlining that word as important. For sonnet 27 and 60, most FGs belong to the rhetorical category, that's where the strongest correlations were observed. For sonnet 66, most FGs belong to the morpho-syntactic level. Again, only for that category we observed significant correlations. Combining this pattern with the also conducted understanding and appreciation ratings of our readers leads to new hypotheses: although readers are responsive to the morpho-syntactic foregrounding in sonnet 66, it did not support the process of understanding. Future studies should test whether this incongruence has something to do with the missing overlap between the several FGs described for sonnet 66, or to formulate it in a simpler way, with the fact of missing density fields in sonnet 66.

13. Conclusions

This paper presents the FAM as a multicomponent interface between qualitative and quantitative approaches, in order to shed light on differences in the textual structure of poems which may influence overall understanding and aesthetic appreciation: marking the FGs in all layers of a lyrical text as a whole and taking into account the distribution of the density fields allow the complex texture of the poem to become visible and useful to study the reading processes in their manifold components (including also eye-tracking, to which a further study by our group will be devoted). In order "to translate" density fields into empirical data, we presented two quantification methods, integer and fraction, and used a correlation test to valuate density fields as predictors for reader response. Both the quantification methods proposed in this study indicate clear differences among the sonnets and the density fields distribution attesting a correlation between the distribution of density fields and the reader's behaviour. We hope that the FAM will inspire further attempts to fill in the gap between qualitative and quantitative research in reader response, gaining new insights in the still unexploited magic of poetry.

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