Y. J. Doran*, J. R. Martin and Michele Herrington

Rethinking context: realisation, instantiation, and individuation in systemic functional linguistics

Abstract: In spite of decades of research developing a model of language and context, there is little consensus in systemic functional linguistics (SFL) about how context should be modelled and how language and context are related. In this paper, we review recent work in SFL which focuses on modelling register as a resource – reconceiving field as a resource for construing phenomena, tenor as a resource for negotiating social relations, and mode as a resource for composing texture. This work has a number of implications for SFL's conception of realisation (as strata of abstraction), instantiation (as a cline of generalisation), and individuation (as a scale of belonging). For realisation it bears critically on the issue of whether or not to adopt a stratified model of context (as register and genre) and the relationship between extrinsic functionality (field, tenor, and mode) and intrinsic functionality (ideational, interpersonal, and textual metafunctions). For instantiation, it bears critically on our modelling of principles for coupling (co-selecting and arranging choices within and across languages and related modalities of communication) – for example mass, presence, and association. And for individuation, it bears critically on the perspectives of allocation (i.e. how access to meanings and their uptake is distributed across communities) and affiliation (i.e. how meanings are used to collaborate and struggle, within and between social groups). Our basic aim in this paper is to suggest a model for improving traction as far as SFL work on language in context is concerned, fully embracing a multimodal perspective on language and related modalities of communication as resources for meaning.

Keywords: context; field; mode; register; systemic functional linguistics; tenor

*Corresponding author: Y. J. Doran, National School of Education, Australian Catholic University, Strathfield, NSW, Australia, E-mail: yaegan.doran@acu.edu.au. https://orcid.org/0000-0002-3611-5702
J. R. Martin, Department of Linguistics, University of Sydney, Sydney, NSW, Australia,
E-mail: james.martin@sydney.edu.au
Michele Herrington, Institute for Learning Science and Teacher Education, Australian Catholic University, Melbourne, VIC, Australia, E-mail: michele.herrington@acu.edu.au

1 Modelling context

In this paper, we propose a new perspective on modelling field, tenor, and mode in systemic functional linguistics (SFL hereafter). This involves treating each contextual variable as a resource – reconceiving field as a resource for construing phenomena, tenor as a resource for negotiating social relations, and mode as a resource for composing texture. In doing so we outline some of the key implications of this new perspective for SFL's conception of realisation (as strata of abstraction), instantiation (as a cline of generalisation), and individuation (as a scale of belonging). For realisation, we argue that it bears critically on the issue of whether or not to adopt a stratified model of context (as register and genre) and the relationship between extrinsic functionality (field, tenor, and mode) and intrinsic functionality (ideational, interpersonal, and textual metafunctions). For instantiation, we suggest that it bears critically on our modelling of principles for coupling (co-selecting and arranging choices within and across languages and related modalities of communication) – for example mass, presence, and association. And for individuation, we propose that it bears critically on the perspectives of allocation (i.e. how access to meanings and their uptake is distributed across communities) and affiliation (i.e. how meanings are used to collaborate and struggle, within and between social groups). Our main concern is to develop a model which improves traction as far as SFL work on language in context is concerned, fully embracing a multimodal perspective on language and related modalities of communication as resources for meaning.

2 Semantic variation

As reviewed in Tann (2017), Martin (2010) outlines an SFL framework for the study of semantic variation organised around three 'hierarchies' of meaning – realisation (strata of abstraction), instantiation (cline of generalisation), and individuation (scale of belonging). This is our starting point for this paper. Martin's proposals assume an SFL framework involving a stratified model of context (as genre and register) and a stratified model of language (as discourse semantics, lexicogrammar, and phonology/graphology/sign) – of the kind reviewed in Martin (2014, 2016). In this paper, we draw attention to two key developments since that time that arise from viewing the register variables of field, tenor, and mode from multiple perspectives. These are the perspectives from (i) realisation, where the register variables field, tenor, and mode are reconstrued as resources for making meaning; and (ii) instantiation, involving a reconsideration of register from a multifunctional perspective on knowledge building (mass), social relations (association), and context dependency (presence). In order to keep the topic manageable, we will regrettably set aside work on affiliation (reviewed in Logi and Zappavigna 2022; Stenglin 2022; Zappavigna 2019) which bears critically on instantiation and individuation research. For reviews of

recent developments in this area, see Zappavigna and Martin (2018), Logi and Zap-pavigna (2022), and Zappavigna and Logi (in press). For alternative SFL perspectives on context, more strongly influenced by Hasan and her colleagues see e.g. Bowcher (2019), Hasan (2009a, 2014, 2015, 2016, 2020), and Moore (2017).

3 Register as a resource

The stratified model of context assumed here is outlined in general terms in Figure 1 – where genre is a supervenient system realised through choices in register (after Martin 1992). In this model, register is the name of the stratum comprising the contextual variables field, tenor, and mode. This contrasts with Halliday's use of the term register to refer the skew of probabilities in semantic systems inside language by field, tenor, and mode (e.g. Halliday 1991a, 1991b). As far as the realisation relationship between the contextual variables field, tenor, and mode and language is concerned (i.e. probabilistic realisation), this difference is purely terminological. Language realises field, tenor, and mode in both models, and field, tenor, and mode choices skew language choices in both models. The substantive difference in the models revolves around whether or not context is stratified into field/tenor/mode and genre, or only includes field/tenor/mode.[1]
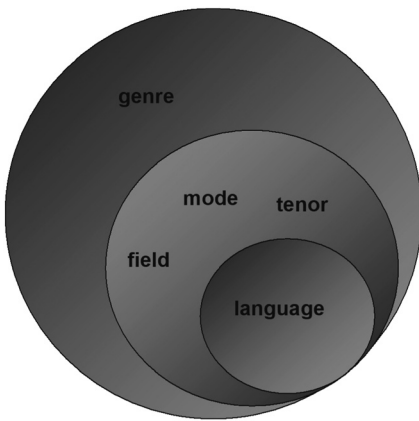

Figure 1: Language, register (field, tenor, and mode) and genre.

1 As this terminological distinction has often led to confusion, it would perhaps be useful in the model assumed here to use Gregory's (1967) suggestion of 'diatype' for the skewing of probabilities in the systems of language by choices in field, tenor and mode (i.e. Halliday's register), leaving register as the cover term for field, tenor, and mode.

In general terms, genre models context as a system of staged, goal-oriented social processes realised through register, the latter comprising field, tenor, and mode (Martin 1992; Martin and Rose 2008). Turning to register variables, field is concerned with what is going on, tenor addresses who is taking part, and mode deals with the role assigned to language (alongside attendant modalities of communication and behaviour). Halliday (in Halliday and Hasan 1985: 12) provides a little more detail:

> **field** is concerned with "what is happening […] the nature of the social action that is taking place: what is it that the participants are engaged in, in which the language figures as some essential component?" (Halliday and Hasan 1985: 12)

> **tenor** addresses "who is taking part, to the nature of the participants, their statuses and roles, including permanent and temporary relationships of one kind of another […] and the whole cluster of socially significant relationships in which they are involved." (Halliday and Hasan 1985: 12)

> **mode** deals with "what part the language is playing […] including the channel (is it spoken or written or some combination of the two?)" (Halliday and Hasan 1985: 12)

These general characterisations offer a useful starting point for viewing language in relation to context. Note however that when genre is treated as a supervenient system there are implications for more specific characterisations of field, tenor, and mode. As far as field is concerned it means that with respect to the modelling of socio-semiotic processes such as enabling, exploring, expounding, reporting, and the like in Matthiessen's work (e.g. Figure 6.13 in Matthiessen et al. 2008) or the modelling of verbal action such as instructing, planning, narrating, informing, and the like in Hasan's work (e.g. Figure 3 in Hasan 1999) – both are handled at the stratum of genre, not register (see Martin 1992; Martin and Rose 2008). Similarly in relation to mode, the modelling of rhetorical 'modes' such as expository, didactic, persuasive, descriptive, and the like in Halliday's work (e.g. Halliday 1978: 143–145) is also handled at the stratum of genre, not register. This division of labour distributes the wide range of phenomena a model of social context must conceptualise if it is to engage closely with language across four context variables instead of three, and helps ensure that each component of field, tenor, and mode is not doing so much work that it no longer matches up with the internal metafunctional organisation of language.[2]

---

[2] Matthiessen et al. (2022: Figure 7.9) make this lack of resonance in their modelling clear in a diagram linking what they consider to be different fields of activity with different areas of grammar "at risk" – implicating ideational, interpersonal, and textual systems, not just ideational ones.

The idea that extrinsic functionality (i.e. field, tenor, and mode) correlates with intrinsic functionality (i.e. ideational, interpersonal, and textual) dates from at least Halliday (1975). Certainly by Halliday (1978) the field, mode, and tenor dimensions of context are correlated with the ideational, textual, and interpersonal metafunctions, respectively – with contextual categories variously described as 'reflected in', 'determining', 'activating', 'associated with', and 'realized through' intrinsic functionality (i.e. metafunctions). For Halliday (in Halliday and Hasan 1985: 29), there is a systematic relationship between contextual variables and metafunctions, such that "in general terms, the field is reflected in the experiential meanings of the text, the tenor in the interpersonal meanings, and the mode in the textual meanings". Turning this around he (Halliday and Hasan 1985: 29) continues: "experiential meanings are activated by features of the field, interpersonal meanings by features of the tenor, and textual meanings by features of the mode". Hasan (2015: 128) refers to this relationship as "context-metafunction resonance" and characterises it as a hypothesis.

With reference to this hypothesis, Hasan (1995: 233) is careful to acknowledge that the parameters are permeable: "It is difficult to ignore for long the fact that choices in one parameter attract or repel those in the others". Indeed Hasan (2014) includes some useful discussion of how co-selections across field, tenor, and mode networks could be formalised.[3] Hasan (1999: 244–245) outlines the relation between resonance and permeability as follows, drawing attention to the fact that permeability has to be understood as partial if the correlation between contextual parameters and metafunctions is to be maintained.

> The contextual parameters – field, tenor and mode – are not, to use Bernstein's (1975) terminology, three strongly classified domains, each with a clear-cut boundary of its own: they are in fact permeable. What choices are made in field is relevant to some extent to the choices in tenor and in mode. Thus, as discussed above, the social activity of promoting a sociological publication by producing a blurb has implications not only for (some of) the attributes of the promoter and prospective buyer but also for some features of mode. Naturally, the interdependence across the three parameters is partial: the choices in one parameter do not "determine" or fully "predict" all the choices in the remaining two, otherwise we would not have needed to recognise three separate parameters. What happens typically is that they display (with apologies to Firth 1957) a "mutual prehension": the echoes of a choice in one are found to some extent in the choices of the others. (Hasan 1999: 244–245)

---

3 Hasan (2014) comments on formalising 'if/then' relations across simultaneous systems in system networks in relation to what she considers the relative prevalence of co-selections in models of context as follows: "I am not aware of any full length manual or discussion of what I am calling the representational technology of sys-net [i.e. system networks; YJD/JRM/MH]; nor am I aware of any courses designed to teach this aspect". Martin (2013) in fact provides a manual of this kind, based on a number of intensive courses taught in Sydney and around the world.

We will not be 'testing' the context-metafunction resonance 'hypothesis' here; but we are concerned with permeability and how it can be managed in a model of context in which resonance is sustained. The stratified model of context assumed in this paper has long been argued as one essential step in this direction on the grounds that modelling genre relations as part of field creates far too much permeability as far as the relation of field choices to interpersonal and textual meaning are concerned (Martin 1992, 1999, 2001, 2014); these arguments are familiar ones in SFL circles and will not be rehearsed here (see for example the relevant chapters in Bartlett and O'Grady 2017; Thompson et al. 2019). In this paper we take another step by reconstruing field, tenor, and mode as resources for making meaning (as opposed to classifications of kinds of context) – with a view to designing networks that strengthen the correlation of intrinsic with extrinsic functionality (Section 3 below). In addition we will offer an interpretation of permeability from the perspective of instantiation – with respect to principles for coupling choices across metafunctions which we refer to as mass, association, and presence (see Section 4 below).

In essence, what we are proposing in this paper is that given the significant expansion in the architecture of SFL in recent decades – in terms of more clearly distinguishing the hierarchies of realisation, instantiation, and individuation – we have an opportunity to rethink our understanding of field, tenor, and mode. In particular, we will suggest that given the wide-range of things field, tenor, and mode have been asked to account for, a fruitful avenue for exploration is to consider them from multiple angles. Rather than just considering them as components of a single stratum within the hierarchy of realisation, we can also consider them in terms of guiding principles for the probabilistic co-selection and arrangement of choices in instantiation (linking more closely to Halliday's 'register' and Gregory's [and our] 'diatype'). We can also consider them from the perspective of individuation as arenas of variation, contestation, and collaboration (though this latter perspective will only briefly be touched upon in this paper). In short, field, tenor, and mode are asked to do a lot in SFL theory, and we propose it is time to give SFL the theoretical space it needs to do so. We will illustrate these points below by focusing on cell biology, drawing on Mukherjee (2022) and data from secondary school science teaching.[4]

3.1 Field as a resource

Following on from Halliday (1978) the basic approach to characterising field in SFL has been a classificatory one.[5] He (Halliday 1978: 64, 115, 143, 222) notes for example the fields of personal toilet, child at play, games and buying/selling newspapers as goings on. Martin (1992: 544) classifies fields in relation to how they are learned – as domestic, specialised (e.g. sport, craft, trades), administrative (e.g. bureaucracy, legislation, law), or exploratory (science, social science, humanities). Later on, in dialogue with Muller (2000) and Maton (2014), Martin (in Martin and Maton 2017; Martin et al. 2020a) further classifies exploratory fields according to what Muller calls verticality and grammaticality – in simple terms the extent to which fields develop by testing hypotheses in order to establish ever more general understandings covering an ever wider range of data or by developing new ways of interpreting comparable and/or alternative data.

These approaches have proven useful for understanding different spheres of activity. But it has proven difficult to generalise these classifications beyond relatively common-sense descriptions without shifting toward descriptions that impinge upon all three metafunctions. In addition, as Maton (2014) points out, discrete classifications of fields such as this obscures the wide range of variation and contestation inherent in all social fields – no field is everywhere and always the same. Classifications such as those above are often useful to think with, but become difficult to use when confronted with data.[6]

Accordingly, in this section we will outline field as a *resource* for construing phenomena. This perspective emphasises the resonance between field and the ideational metafunction in language, as well as offering tools that can link upwards with genre. The model presented here is that of Doran and Martin (2021). Under this model, phenomena can be construed *dynamically* as a set of activities oriented to some social action or they can be construed *statically* as relations among items.

Beginning with the static perspective, this involves viewing fields as sets of items that can be arranged into taxonomies. One type of taxonomic relation is that of

---

5 We set aside discussion of work classifying fields by Hasan (collected as Hasan 2016) and Matthiessen (as reflected in Matthiessen et al. 2008, 2022) here since their more detailed classifications have focused on what Hasan calls verbal action and what Matthiessen calls activity – both are thus concerned with genre, not field, in the model of context assumed here.

6 Of course, SFL must be able to grapple with how these fields work. But under the model presented here, we suggest that this is likely best done not by classifying them as discrete choices within the realisation hierarchy, but rather by looking at them as arenas of cross-metafunctional variation, contestation and collaboration from the perspective of individuation hierarchy – which we do not have space to explore this in detail in this paper.

composition – where items are arranged into a part-whole relations. For example, in a classroom lesson in cell biology, the teacher at one stage reads from the textbook:

Teacher	Each centriole is a ring of nine groups of microtubules. There are three microtubules in each group […]. In the complete animal cell centrosome, the two centrioles arrange themselves such that one is perpendicular to the other.

Here, the teacher explains that animal cell centrosomes are composed of two centrioles, which in turn include nine groups of three microtubules. We can visualise this as a compositional taxonomy as in Figure 2.
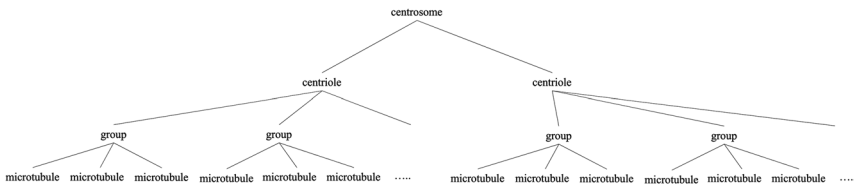

Figure 2: Compositional taxonomy of a centrosome.

Alternatively, items can be related in terms of type and sub-type into a classification taxonomy. Mukherjee (2022: 67–69) draws on this when he lays out the diversity of cells that occur on Earth:

> Every cell on Earth – which is to say every unit of every living being – belongs to one of three entirely distinctive domains, or branches of living organism. The first branch comprises **bacteria**: single-celled organisms that are surrounded by a cell membrane, lack particular cellular structures found in animal and plant cells, and possess other structures that are unique to them […] We think of them as pathogens – batonella, pneuomococcus, salmonella – because a few of them cause disease […]. We – you and me – inhabit a second branch, or domain, called **eukaryotes**. The word *eukaryote* is a technicality: it refers to the idea that our cells, and the cells of animals, fungi, and plants, contain a special structure called a nucleus (*karyon*, or "kernel" in Greek). This nucleus, as we will soon learn, is a storage site for chromosomes. Bacteria lack nuclei and are called **prokaryotes** – that is, "before nucleii" […] And now the third branch: **archaea**. It may be the single most startling fact in the history of taxonomy that this full branch of living beings remained undiscovered until about fifty years ago […] they lack the defining features of the other two domains. (Mukherjee 2022: 67–69)

This stretch of text is organised around three subtypes of organism (in bold above), for which he also gives some examples. We can visualise this classification taxonomy as in Figure 3.

Whereas classification and composition taxonomies are often considered separately from one another, in this excerpt Mukherjee (2022) shows that the classification of types of organism is based upon their composition (at least in this presentation of the
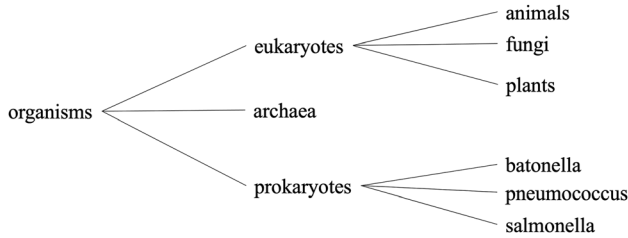
Figure 3: Classification taxonomy of organisms.

subtypes). Eukaryotes are eukaryotes because they have cells with a nucleus; prokaryotes are prokaryotes because they have only one cell, which has a cell membrane; archaea are archaea because they lack the defining features of the other two subtypes. This illustrates that in technical fields, classification and composition and indeed all resources of field are often mutually defining. They together form a web of relations between items that underpin a complex field (what Maton 2014 within Legitimation Code Theory (LCT) calls an epistemological constellation).

A complementary perspective on field is a *dynamic* perspective that construes phenomena as a set of *activities*. For example, in our classroom the teacher explains mitosis as an activity where a single cell divides into two daughter cells (underlined).

| Teacher | Mitosis is the process where <u>a single cell divides into two identical daughter cells</u>. |

This example presents mitosis as a single activity – what we can call an *unmomented* activity. Alternatively, activities can be divided into a series of moments. When Mukherjee (2022: 99) visualises mitosis, he presents a caption that explains it in terms of its moments – what we call a *momented* activity. After describing that the chromosomes are initially present in loose threadlike forms in the nucleus, he explains:

> Then the threads tighten into dense bundles. The nuclear membrane dissolves, and the chromosomes separate into two sides of the cell, as if drawn by some forces. When they've fully separated […] the cell splits, generating two new cells. (Mukherjee 2022: 99)

The activities that Mukherjee (2022) describes are as follows (where ^ indicates a sequence):

> The threads tighten into dense bundles
> ^
> The nuclear membrane dissolves
> ^
> The chromosomes separate into two sides of the cell, as if drawn by some forces
> ^
> They (the chromosomes) fully separate

^
The cell splits
^
Two new cells are generated
(Mukherjee 2022: 99)

This presents a complementary view to the static one focused on items – it outlines a dynamic unfolding of events. These activities are interconnected with the items and taxonomies that are involved in them. In this instance, the cell splits due to activities associated with two of its parts: the nuclear membrane dissolving and the chromosomes separating.

Finally, both activities and taxonomies can be described in terms of potentially gradable *properties.* For example, when Mukherjee (2022: 68) describes bacteria, he does so by describing their characteristics (in bold) and the place they live (spatio-temporal properties underlined):

> The **abundance** and **resilience** of bacteria stagger the mind. Some live in oceanic thermal vents where the water reaches **near boiling temperature**; they could easily thrive inside a steaming kettle. Some prosper within stomach acid. Yet others live, with seemingly equal ease, in the **coldest** places on earth, where the land freezes into **packed**, **impenetrable** tundra for ten months of the year. They are **autonomous**, **mobile**, **communicative**, and **reproductive.**
> (Mukherjee 2022: 68)

As this excerpt shows, these properties can be graded as being higher or lower (known as *arrayed*), such as *the **coldest** place on earth* and ***near boiling** temperature.* Although not specified here, arrayed properties are often gauged by being measured or quantified (e.g. 133.61 °F, 100 °C).

Taxonomy, activity and property make up the basic perspectives on field and offer complementary construals of phenomena. But as we have seen, they do not build their meaning in isolation. Their meanings regularly *interrelate* with each other, as we saw above where the classification taxonomy of types of organism was based upon their differing compositional taxonomies.

In addition, each of these perspectives on phenomena can be *reconstrued* in terms of the other. For example, the teacher names the activity of a cell dividing into two identical daughter cells as *mitosis.*

Teacher	**Mitosis** is the process where a single cell divides into two identical daughter cells.

By naming it in this way, the teacher reconstrues the activity of a single cell dividing into two identical daughter cells as an item – mitosis; or what we call an *itemised activity*. This allows mitosis to function as an item and be related to other items – for exemple by establishing a classification taxonomy of types of mitosis

(e.g. orthomitosis, pleuromitosis, extranuclear mitosis, intranuclear mitosis, closed mitosis, open mitosis, etc.). At the same time, mitosis can function as an activity and be sequenced with other activities as, say, moments within the cell cycle, along with interphase, telophase, and cytokinesis. Properties can also be reconstrued – for example when Mukherjee (2022) described bacteria as in terms of their *abundance* and *resilience* (thereby reconstruing the properties *abundant* and *resilient* as itemised properties).

Reconstruals and interrelations such as these allow for increasingly expansive and integrated construals of phenomena. They provide rich resources to build knowledge of the world around us and to map and explain highly complex fields (Doran and Martin 2021; see also Carr 2023; Chen 2024). Together with the basic relations of field – activity, property, and taxonomy – they also link closely with ideational meanings within language (see Hao 2020), which for SFL theory, allows us to maintain ideational register/metafunction resonance between language and context.

3.2 Tenor as a resource

As with field, the basic approach to characterising tenor in SFL has also been a classificatory one. Halliday (1978: 222) notes for tenor that examples "of role relationships, that would be reflected in the language used, are teacher/pupil, parent/child, child/child in peer group, doctor/patient, customer/salesman, casual acquaintances on a train, and so on". Eggins and Slade (1997: 52–53) suggest that tenors could be co-classified along four dimensions:

> **status relations** (e.g. customer/salesperson)
> **affective involvement** (e.g. friends/lovers)
> **contact** (e.g. immediate family/one off encounters)
> **orientation to affiliation** (e.g. fellow students/fellow passengers on bus)
> (Eggins and Slade 1997: 52–53)

Tenor classification is considerably elaborated by Hasan (2014, 2020: 274, 282, Figures 5 and 7 respectively). Her tenor analysis of a phase of mother/child interaction gives us a glimpse of the delicacy of the co-classification and subclassification involved (Haan 2020: 297). As specified below, there are four major dimensions of co-classification: AGENTIVE ROLE, TEXTUAL ROLE, SOCIAL ROLE, and SOCIAL DISTANCE, alongside multiple co-classifications and subclassifications within these systems.

> First interactant (child):
> AGENTIVE ROLE: care receiver;
> TEXTUAL ROLE: speaker/addressee present in 'mss' [material situational setting];
> SOCIAL ROLE: hierarchic: lower; invisible; offspring; Australian; female; child;

Second interactant (mother):
AGENTIVE ROLE: caregiver;
TEXTUAL ROLE: speaker/addressee present in 'mss';
SOCIAL ROLE: hierarchic: higher: invisible; mother; Australian; female; mature;
SOCIAL DISTANCE: minimal

As with field, these approaches have offered useful insights into the range of factors that need to be accounted for when considering the sociality of language. But like field, it has proven difficult to push past common-sense classifications such as 'mother' or 'female' etc. This is especially the case considering the highly contested and variable nature of these demographic distinctions that belie an easy classification as a single feature within context (as both Hasan's and Cloran's work have shown; e.g. Cloran 1989; Hasan 2009b).

Perhaps more challenging is how to relate many of these features to those of language – it is not clear how, for example, we are to cleanly relate the categories of 'mature' or 'offspring' to distinct patterns of realisation within language. Nonetheless if we abstract away from precise categories and consider the dimensions such as contact and status, we are on firmer ground. As Poynton (1990) has shown, variables in terms of contact (how close one is to another person) and status (the degree of 'equality' or 'hierarchy' in the relationship) can in fact be linked to manifestations of language having to do with how reciprocal the sets of choices are between people (status) and how many meanings can be shared (contact). As we will discuss in Section 3.2 below, these choices are not restricted to the interpersonal metafunction, but in fact impinge upon choices in all metafunctions. Thus while these dimensions can be more clearly associated with patterns of language, we once more face the issue that this approach erodes the metafunction/context resonance upon which SFL's model of language and context is constructed. Accordingly, we will propose below that these dimensions be interpreted as principles of instantiation, rather than as tenor options within the realisation hierarchy.

Finally, recent work on how people build relationships and community discussed as 'affiliation' (Knight 2010; Logi and Zappavigna 2022; Stenglin 2004) and on how people position each other as speakers work toward consensus (Kim et al. 2023; Muntigl 2009; Zhang 2020a, 2020b, 2021) has highlighted the close interaction between interpersonal systems of evaluation (described in Martin and White 2005 in terms of APPRAISAL) and dialogue (described in terms of exchange – Berry 1981a, 1981b; Martin 1992; Ventola 1987 – and speech function – Halliday 1985), as well as parallels between this meaning-making and patterns of alignment within written text (Doran 2020a; White 2020). But there has yet to be a clearly articulated 'place' for these interactions in SFL theory.

In response, Doran et al. (2024) propose a new model of tenor as a *resource* for enacting social relations. This model works to make clear the links between tenor

and the interpersonal systems of language, and so maintain SFL's context/meta-function resonance, as well as providing a map of resources that are used across situations to negotiate social relations and realise distinct genres.

Under this model, people can *tender* meanings to be engaged with, or they can *render* meanings that have been put forward. For example in the classroom we have looked at, following the teacher asking the students what is inside the centrosome, a student tenders an answer that the teacher then renders by supporting it (by both repeating the answer and using positive attitude *Right, Sweet*). This follows a prompt from the teacher "Inside the centrosome is … again?" An arrow shows the direction of the rendering.

Student:	Centrioles	*tender*
		↑
Teacher:	Centrioles. Right. Sweet.	*render: support*

In other instances, the teacher rejects students' suggestions. In the following, they do this by using the Modal Adjunct *No*, plus *they're not condensed yet*:

Student:	I thought they'd have to be condensed.	*tender*
		↑
Teacher:	No, they're not condensed yet.	*render: reject*

These instances illustrate simple instances where rendering cleanly follows tendering. But in practice, tendering and rendering are often done together. This occurs when in response to what one person puts forward, someone else puts forward something that only implies their support or rejection. An adapted example from our classroom illustrates this when the teacher and a student go back and forth as to what is on a diagram:

Student:	Those are the spindle fibres – the green things.	*tender*	
		↑	
Teacher:	Those would be your microtubules holding the cell	*render: reject*	*tender*
			↑
Student:	But they're moving	*tender*	*render: reject*
		↑	
Teacher:	They're condensing	*render: reject*	*tender*

Here, the student puts forward that the green things are spindle fibres. The teacher rejects this, not by saying explicitly that they are wrong, but by tendering an

alternative suggestion (that they are microtubules). However the student is not convinced, and so counters by arguing *they're not moving* – both rejecting the teacher's characterisation and tendering a reason for it – a move which the teacher once more rejects by tendering an alternative position (*they're condensing*).

This example is a conflictual one, where the teacher and student are at odds. But in casual conversation, a strategy of tendering and rendering support at the same time forms a crucial means of keeping a conversation going indefinitely (Eggins and Slade 1997) – as it allows both responding to and extending what has been said.

Importantly, these resources do not just occur in dialogue, but allow for different positions to be negotiated in monologue. This typically draws on resources of ENGAGEMENT and ATTITUDE, as different positions are put forward, supported, or rejected. Indeed, we saw an example of this above where the teacher said *They're not condensed.* Here they drew on the negative *not* (disclaim: deny in Martin and White's ENGAGEMENT system 2005), to reject the position that they are condensed.

Mukherjee (2022: 68–69) uses this resource when recounting the discovery of archaea – the third main branch of organisms. In the example below, the positions that are being rendered (supported or rejected) are underlined, and the resources that render them are in italics for support and bold for reject.

> In the mid-1970s, Carl Woese, Professor of biology at the University of Illinois at Urbana-Champaign, used comparative genetics – the comparison of genes across various organisms – to deduce that we had **mis**classified **not** just some arcane microbe but rather an entire domain of life. For decades, Woese fought a *spirited* but **lonely, bitter war that left him ragged at the edges**. Taxonomy **wasn't** just missing the point, he insisted, it was **missing** a whole living domain. Archaea, Woese argued, were **not** "almost like" bacteria or "almost like" eukaryotes […].
> Many prominent biologists **ridiculed or simply ignored** Woese's work […]. But decades later, we have largely *accepted, validated, and vindicated* his theory, so that archaea are now classified as a distinct, third domain of living creatures.
> (Mukherjee 2022: 68–69)

We can lay this out as in Table 1, which indicates the position being tendered, whether it is being supported or rejected, what is showing this and to whom support or rejection is sourced to.

If we rearrange the table in terms of the source and what they support or reject, as in Table 2, we can more clearly see the positions at stake.

This example shows that a wide range of positions can be supported or rejected not just in dialogue, but in monologue as well. In addition, it illustrates that for this negotiation, it is not enough to just focus on attitude *or* engagement (or for dialogue, *exchange*); rather one must look at how these resources all together realise general patterns of support or rejection. Importantly, this is done almost entirely through interpersonal systems, allowing us to maintain the context/metafunction resonance between tenor and the interpersonal metafunction.

Table 1: Tendering and rendering in a monologic text.

Source	Example	Position tendered	Rendering	Resource for rendering
Woese	We had misclassified […]	The classification of archaea	reject	attitude through prefix: **mis**classification
Woese	[…] not just some arcane microbe	That archaea are just some arcane microbe	reject	Engagement, disclaim: deny through **not**
Mukherjee (author)	Woese fought a spirited by lonely bitter war that left him ragged at the edges.	The argument between Woese and other biologists	support (*spirited*) reject (**lonely, bitter, war, ragged at the edges**)	attitude – both inscribed (*spirited*, **lonely**, **bitter**) and invoked (**war, ragged at the edges**)
Woese	Taxonomy wasn't just missing the point	Taxonomy just missing the point	reject	engagement, disclaim: deny through **wasn't**
Woese	It was missing a whole domain.	Taxonomy's classification of domains of life	reject	attitude – both inscribed (**missing**) and invoked through graduation **(a whole domain)**
Woese	Archaea […] were not "almost like" bacteria or "almost like" eukaryotes.	That archaea are almost like bacteria and eukaryotes	reject	engagement – disclaim: deny through **not** – distance through scare quotes "almost-like"
Many prominent biologists	Many prominent biologists ridiculed or simply ignored Woese's work.	Woese's work	reject	attitude (**ridiculed or simply ignored**)
We (biologists)	Decades later, we have largely accepted, validated and indicated his theory.	Woese's theory	support	attitude (*accepted, validated and indicated*)

Although we cannot explore tenor resources in more detail here, the above texts also illustrate how positions can be sourced to different people, and arranged in relation to each other – such as when Mukherjee (2022) draws on *but* (a resource for countering) to oppose the initial reactions to Woese's work (sourced to *Many prominent biologists*, functioning as the Appraiser) to the current feelings (sourced to *us*):

> Many prominent biologists ridiculed or simply ignored Woese's work […]. **But** decades later, we have largely accepted, validated, and vindicated his theory.

Table 2: Rendering and sourcing in a monologic text.

Source	Support	Reject
Woese		The previous classification of archaea
		That archaea are just some arcane microbe
		That taxonomy was just missing the point
		Taxonomy's classification of whole domains of life
		That archaea are almost like bacteria and eukaryotes
Many prominent biologists (previously)		Woese's work
Mukherjee + Biologists (now)	The argument between Woese and other biologists [spirited] Woese's theory	The argument between Woese and other biologists [lonely, bitter, war that left him ragged at the edges]

The ability to both render positions and orient them in relation to people and other positions offers a means of building large networks of meaning that are organised not through ideational configurations (i.e. through field), but through rhetorical relations (what in LCT Maton 2014 calls an axiological constellation). That is, it allows us to map sets of interpersonal values and how they are oriented to different people and communities (Doran 2020a, 2020b, 2024). As noted above, this is done in a way that maintains the connection between tenor and the interpersonal metafunction.[7]

3.3 Mode as a resource

As with field and tenor, the basic approach to characterising mode in SFL has been a classificatory one. Halliday (1978: 33, 115, 144) mentions speaking/writing, monologue/dialogue, and written to be read aloud to characterise the part language is playing.[8] Martin (1984, 1992) suggests classifying modes along two scales – one

---

7 In addition to the resources noted in this section associated with tendering and rendering (in a system called POSITIONING) and arrangement of positions (ORIENTING), Doran et al.'s (2024) model also presents resources for indicating how invested one is in the meanings being put forward (known as PURVIEW) and how these meanings may have their stakes raises or lowered, their scope widened or narrowed, or be said in a spirit that warns or warms (TUNING).

8 We set aside Halliday's categories of rhetorical mode (noted above) here, as they are a dimension of genre, not mode, in the modelling of context assumed here.

ranging from language in action to language as reflection[9] and another ranging from dialogue to monologue; in addition he considers (1992: 515) the affordances of different modes as far as visual and aural feedback are concerned – i.e. none, one-way, or two-way. Hasan (2014: 54, 2020: 259) presents a delicate categorisation, built up around her perspective on material contact (means of expression – e.g. graphic/phonic) and semantic contact (e.g. elocution, turn management). As with field and tenor, these approaches offer useful insights into how different media, channels, and relative context-dependence affects language. But as has been shown by Martin and Matruglio (2013) in their work on presence and the expansive work on a range of emerging communicative channels (e.g. Zappavigna's 2012, 2018 work on social media), as with field and mode, these perspectives impact upon all metafunctions. As such, we prefer to interpret them from the perspective of instantiation and individuation and develop an alternative model of mode – as a resource that resonates with textual meanings.

The model proposed here conceptualises mode as a resource for organising information. As with the models for tenor and field, it does so in a way that aims to make the links between mode and the textual metafunction clear, while at the same time being able to connect with patterns of genre. Under this tentative model, texts can be organised into chunks of information, by *demarcating* boundaries or *sustaining* the text's flow. These options occur within a system called JUNCTURE.[10]

Mukherjee (2022: 68–69) draws on these resources in order to tell the story of the discovery of archaea we saw above. The excerpt we will explore follows reports of two of the branches of life: *eukaryotes* and *prokaryotes*. It begins by introducing the third branch *archaea* at the beginning of a new paragraph by saying:

> And now the third branch: archaea (Mukherjee 2022: 68).

Before looking at the whole excerpt, we can note that this sentence functions as a clear demarcation of information from the previous chunks about eukaryotes and prokaryotes. From the perspective of PERIODICITY and THEME (Halliday and Matthiessen 2014; Martin and Rose 2007), it puts forward a Hyper-Theme that predicts what is to

---

9 A comparable option in fact treated by Hasan (1999: 311, 2009a: 183, 2020: 276) as a basic dimension of field (her ancilliary/constitutive opposition); given the repercussions of a distinction of this kind for both interpersonal and textual meaning, the placement of this option raises further questions about the viability of context/metafunction resonance in her modelling.

10 Here we distinguish chunks from phases as described by Rose (e.g. Martin and Rose 2008; Rose 2020; and the comparable rhetorical units proposed by Cloran 1994). Chunks in our model are units of mode predominately realised through textual meanings. Phases in Rose's model and Rhetorical units in Cloran's model are multi-metafunctional and are key in realising stages of genres (or text structure). Chunks in any given text may or may not be co-extensive with phases, interacting as they do with meanings in field and tenor.

come (a stretch about archaea) and draws on both a marked and textual Theme (*And now*) in order to shift the text (Fries 1995). From the perspective of IDENTIFICATION (Martin 1992), it both presents a new participant that has not yet previously been mentioned (*archaea*) and splits an established participant chain (via *the third branch*) – making clear that there has been a first and second branch, and that this is a separate *third* branch. And finally, from the perspective of CONNEXION (Halliday and Hasan 1976; Martin 1992), the sentence-initial internal addition conjunction *And* signals a new stretch of language being connected to the previous. Three sets of textually oriented systems, then – PERIODICITY, IDENTIFICATION, and INTERNAL CONNEXION – work together to indicate that there is a new chunk of information coming up.

This sentence introduces a longer chunk of information:

> *And now the third branch: **archaea***. It may be the singularly most startling fact in the history of taxonomy that **this full branch of living beings** remain undiscovered until about fifty years ago. In the mid-1970s, Carl Woese, Professor of biology at the University of Illinois at Urbana-Champaign, used comparative genetics – the comparison of genes across various organisms – to deduce that we had misclassified not just some arcane microbe but rather an entire domain of life. For decades, Woese fought a spirited but lonely, bitter war that left him ragged at the edges. Taxonomy wasn't just missing the point, he insisted, it was missing a whole living domain. **Archaea**, Woese argued, were not "almost like" bacteria or "almost like" eukaryote. ("Almost-like" is the taxonomist's version of a parent saying to a child, "Go away, you're bothering me.")
>
> Many prominent biologists ridiculed or simply ignored Woese's work. In 1998, Ernsts Mayr, the biologist wrote an essay on Woese drenched with teacherly condensation ("Evolution is an affair of phenotypes […] not genes."), getting the story exactly wrong. It wasn't evolution that Woese was contesting, it was taxonomy – which is precisely the question of genes. A bat and a bird may have nearly the same physical characteristics, or phenotypes. It's the differences in their *genes* that gives away the secret: they belong to different taxa. The journal *Science* described Woese as a "scarred revolutionary." But decades later, we have largely accepted, validated, and vindicated his theory, so that ***archaea are now classified as a distinct, third domain of living creatures.***
>
> (Mukherjee 2022: 68–69)

As we noted above, the opening sentence predicts that the following text will talk about archaea. This is done through participant tracking: the entity archaea is presented, and then referred to (in bold above) as *this full branch of living beings* and as *archaea* twice. In addition this entity is classified as *not just some arcane microbe, an entire domain of life*, and *a whole living domain*. The final reference to archaea occurs in the final clause *archaea are now classified as a distinct, third domain of living creatures*, that functions as a Hyper-New synthesising the point of the excerpt. This Hyper-New demarcates the boundary between this excerpt and the following text. But between the opening and closing sentences, the participant chain and classification (amongst other things), functions to *sustain* the chunk of information and make clear that we are still focusing in some sense on the same stretch of information.

Within this excerpt, there are other smaller demarcations. For example, in the first paragraph, the marked Theme *In the mid-1970s*, indicates that there will be a shift – in this case to a story about Carl Woese (who is introduced in this clause). The first sentence as a whole functions as a smaller Hyper-Theme for this story:

> In the mid-1970s, Carl Woese, Professor of biology at the University of Illinois at Urbana-Champaign, used comparative genetics – the comparison of genes across various organisms – to deduce that we had misclassified not just **some arcane microbe** but rather **an entire domain of life**.
>> For decades, Woese fought a spirited but lonely, bitter war that left him ragged at the edges. Taxonomy wasn't just missing the point, he insisted, it was missing **a whole living domain. Archaea**, Woese argued, were not "almost like" bacteria or "almost like" eukaryote. ("Almost-like" is the taxonomist's version of a parent saying to a child, "Go away, you're bothering me.")
>
> Many prominent biologists ridiculed or simply ignored Woese's work.
>> In 1998, Ernsts Mayr, the biologist wrote an essay on Woese drenched with teacherly condensation ("Evolution is an affair of phenotypes […] not genes."), getting the story exactly wrong. It wasn't evolution that Woese was contesting, it was taxonomy – which is precisely the question of genes. A bat and a bird may have nearly the same physical characteristics, or phenotypes. It's the differences in their *genes* that gives away the secret: they belong to different taxa. The journal *Science* described Woese as a "scarred revolutionary."
> But decades later, we have largely accepted, validated, and vindicated his theory, so that **archaea** *are now classified as a distinct, third domain of living creatures.*
> (Mukherjee 2022: 68–69)

This first paragraph tracks Woese's argument, focusing primarily on Woese himself. The paragraph break then leads to a new Hyper-Theme that introduces other biologists' perspectives (*Many prominent biologists ridiculed or simply ignored Woese's work*) – which involves establishing a new participant chain involving countering authorities (*Many prominent biologists*, *Ernsts Mayr, the biologist*, *The journal Science*). Put in terms of the model of mode we are introducing here, each of the opening lines – starting with *In the mid-1970s*, *For decades*, and *Many prominent biologists* – all function to demarcate distinct chunks of information. But they do this within the larger chunk we have already established that focuses on archaea more broadly. This illustrates that there is not just a single linear chunking of information in a text, but rather that texts can be organised around a *hierarchy of demarcation* – whereby smaller chunks of information are organised within larger chunks of information.

Indeed if we zoom out to an even longer stretch than we have here, the whole excerpt functions together with the previous sections on eukaryotes and prokaryotes as a single, larger chunk introducing what organisms are. This is suggested by the internal addition connexion *And* (which suggests a linking with the previous chunk) and the chain splitting *the third branch* (which, while introducing archaea and in doing so establishes a new participant chain) which in fact refer back to and illustrate

similarity with the previous two branches. Importantly, this hierarchy of demarcation is developed not by a single discourse semantic system, such as PERIODICITY, IDENTIFICATION, or INTERNAL CONNEXION,[11] but by them all working together. And since these systems are all primarily concerned with organising texture, the resonance between textual meta-function and mode is sustained. Establishing hierarchies of demarcation also conforms to the general periodic structure of textual systems, whereby the same 'meanings' can be overlayed on top of each other at bigger of smaller stretches (Halliday 1979).

Below, the excerpt is replayed with boxes indicating some of the demarcation, with smaller chunks nested within larger ones.[12]

> And now the third branch: archaea. It may be the singularly most startling fact in the history of taxonomy that this full branch of living beings remain undiscovered until about fifty years ago.
>
> > In the mid-1970s, Carl Woese, Professor of biology at the University of Illinois at Urbana-Champaign, used comparative genetics – the comparison of genes across various organisms – to deduce that we had misclassified not just some arcane microbe but rather an entire domain of life.
> >
> > > For decades, Woese fought a spirited but lonely, bitter war that left him ragged at the edges. Taxonomy wasn't just missing the point, he insisted, it was missing a whole living domain. Archaea, Woese argued, were not "almost like" bacteria or "almost like" eukaryote. ("Almost-like" is the taxonomist's version of a parent saying to a child, "Go away, you're bothering me.")
> > >
> > > Many prominent biologists ridiculed or simply ignored Woese's work. In 1998, Ernsts Mayr, the biologist wrote an essay on Woese drenched with teacherly condensation ("Evolution is an affair of phenotypes… not genes."), getting the story exactly wrong. It wasn't evolution that Woese was contesting, it was taxonomy – which is precisely the question of genes. A bat and a bird may have nearly the same physical characteristics, or phenotypes. It's the differences in their genes that gives away the secret: they belong to different taxa. The journal Science described Woese as a "scarred revolutionary."
>
> But decades later, we have largely accepted, validated, and vindicated his theory, so that archaea are now classified as a distinct, third domain of living creatures.

In addition to chunking up the text, mode also functions as a resource for foregrounding and backgrounding information, through a system called PULSING. In the excerpt above, this is most clearly realised through the Hyper-Themes and Hyper-News which foreground the key meanings that occur. In this case, what is

---

11 The precise metafunctional address of internal CONNEXION, which we treat as a textual resource here, is arguable. Martin (1992) interprets it as 'textual grammatical metaphor', a position he retracts in Martin (2024) in his discussion of what he calls 'coordination' resources.

12 There is more demarcation occurring in this excerpt than just we have shown; however for reasons of space we cannot explore it here. In spoken language, phonological resources of tone concord also contribute to realising demarcation or sustaining (Halliday and Greaves 2008).

foregrounded is the ideational category of archaea as a branch of life in the Hyper-Theme and the eventual interpersonal vindication of this category and Woese in the Hyper-New:

> And now the third branch: archaea.
> […]
> But decades later, we have largely accepted, validated, and vindicated his theory, so that archaea are now classified as a distinct, third domain of living creatures.

Foregrounding of this kind is potentially realised through a range of systems including PERIODICITY in discourse semantics, THEME in lexicogrammar, INFORMATION and SALIENCE in phonology, as well as paralinguistic vocal features of SOUND QUALITY, including loudness, tenseness, pitch height (van Leeuwen 1999), the use of gestural beating (Ngo et al. 2022a) and salience within visual multimodal texts (Kress and van Leeuwen 2020). It offers a resource for composing texts in terms of pulses of prominence, foregrounding, and backgrounding information as a text flows.

Finally, mode offers resources for distributing information across a text, via a system called DISTRIBUTION. The basic distinction is between an instance of language that indicates that there is further information needed to understand what is being said (i.e. that the information is in some sense *distributed*) or that all the information is given in the *immediate* instance.

Distribution of information occurs throughout the classroom example we have been looking at, where the teacher refers across modalities to the slides they are using (in bold below):

> I have **this image here** of the cell undergoing mitosis for two replicated daughter cells. You've got **here** DNA replication with the cell cycle – what part is that called?

In this example, the teacher is specifying that the information needed is distributed between the spoken language and the slide they are looking at. She does this by drawing on exophoric reference to the infographic (Halliday and Hasan 1976; Martin 1992). This contrasts with a number of instances at the beginning of the class, where the teacher is establishing what they are going to do. In these instances, marked in bold, the teacher is indicating that there is no relevant information elsewhere that is needed to follow what is going on – the information is not distributed but *immediate*.

> What we're going to do today is model **a representation of mitosis** as a point of reference to explain these stages. I'm going to give you **some materials** so when we jump into our groups you're going to construct **a model** for the stages.

The immediacy of the information is established in three of these instances through presenting reference (Martin 1992) – *a representation of mitosis, some materials, a model*, where the indefinite Deictics indicate that these participants are being

introduced and are not to be recovered from elsewhere in the text or the situation. The fourth possible instance, *our groups*, draws on homophora (Halliday and Hasan 1976); in this case the entity's identity is presumed, and so does not need to be recovered from anywhere else.

Distribution can also occur within texts. The clearest instance of this involves drawing on anaphora – whereby an instance refers backwards in a text, often via pronouns. In the following text, the teacher first puts forward the entity 'nucleolus', and then each subsequent reference uses *it* to indicate the information being sought is distributed across the text:

Teacher	Do you know what the nucleolus is?
Student	Isn't that where **it** makes ribosomes?
Teacher	Yep, so **it** makes ribosomes. **It** produces ribosomes which move out of the nucleus through the pores.

Phoricity resources such as those noted above are one of the key means of distributing information. But they are by no means the only resource for doing this. In the text above, the two questions put forward by the teacher and student: *Do you know what the nucleolus is?* And *Isn't that where it make ribosomes?* also make clear that the information of the text is to be distributed – in this case that another move is needed for closure. Similarly, the use of text reference (Martin 1992), often coupled with semiotic entities (Hao 2020) and connexion resources, also indicates a distribution of information. In the following (constructed) example, the semiotic entity *three main arguments* points forward to the fact that a set of arguments are required for the full meaning of the section; the internal connexions *First, Second*, and *Finally* signal that each argument connects either forward or backward with the other arguments; and the text reference *None of these arguments* at the end, looks backwards by making clear that the information that is 'not convincing' is to be found earlier in the text. These resources all work together to distribute information throughout the text (while also working to demarcate and foreground different components of this information).

> There have been **three main arguments** against students wearing uniforms. **First**, they dampens students' individual expression. **Second**, uniforms are expensive. And **third**, they harken back to an old-fashioned time of rigid uniformity. **None of these arguments** are convincing.

As for tenor and field, these systems of mode – DISTRIBUTION, JUNCTURE, and PULSING – offer a model of the *resources* drawn on to organise text, rather than a common-sense classification of different modes. This model of mode as a resource is considerably less developed than that for field (Doran and Martin 2021) and for tenor (Doran et al. 2024), but it nonetheless offers a means of maintaining the context-metafunction resonance that has underpinned SFL's conception of the relationship between the

internal and external functionality of language. Of course, this does not mean that other considerations often grouped under field, tenor, and mode (e.g. degrees of technicality, social contact, and context-dependence) do not need to be accounted for. Rather, it means that they need to be conceptualised in a theoretically clearer manner. To do this, we propose a perspective from instantiation that treats these and other variables as coupling principles – i.e. as principles for the co-selection and arrangement of choices in language.

4 Multifunctional instantiation: mass, association, and presence

In Section 3, we introduced our modelling of register as a resource for construing phenomena (field), negotiating positions (tenor), and composing texture (mode). In this section we turn from realisation to instantiation and introduce a multifunctional perspective on some of the traditional concerns of field, tenor, and mode studies in previous work. Re-visiting traditional work on field leads us to a multi-functional perspective on knowledge-building we refer to as mass (Martin 2017); re-visiting traditional work on tenor leads us to a multi-functional perspective on enacting social relations we refer to as association; and re-visiting mode leads us to a multifunctional perspective on organising information flow we refer to as presence (Martin and Matruglio 2013). Our reconsideration of the traditional concerns of field and mode were inspired by dialogue with LCT, its concern with semantic density and semantic gravity in particular – dialogue documented in Christie and Martin 2007, Christie and Maton (2011), Martin and Maton (2017), Martin et al. (2020b), Maton et al. (2016), and Maton et al. (2021). For detailed work on mass and presence in relation to science infograpahics see Martin and Unsworth (2024). The proposals for association build upon the work of Poynton (e.g. 1990) in particular. We propose mass, association, and presence as principles of co-selection during the process of instantiation – which we believe provide a partial account of the phenomenon of permeability in Hasan's work as introduced above.

4.1 Mass

Responding to Maton's characterisation of semantic density as involving 'formal definitions, empirical descriptions or feelings, political sensibilities, taste, values, morals, affiliations', we have revisited work on technicality in an effort to broaden SFL's conception of specialised knowledge. In terms of SFL's concept of metafunction this means extending the focus on ideational meaning to include interpersonal and textual perspectives as well. As noted above, taken together, the contributions from the different metafunctions are referred to as **mass** (introduced in Martin [2017] and further elaborated with respect to the analysis of infographics in Martin and Unsworth [2024]).

4.1.1 Technicality

From an ideational perspective we are concerned with **technicality** – in particular the nature of more and less common-sense knowledge in discourse. Mukherjee (2022), in his popular science celebration of cell biology, introduces readers to seminal work on cell composition as follows:

> As a botanist, Schleiden was naturally curious about the nature of plant tissues, and when he looked at stems, leaves, roots, and petals, he found the same unitary structures that Hooke had discovered. Tissues, he wrote, were made of agglomerations of tiny, polygonal units: "an aggregation of fully individualized, independent, separate beings, the cells themselves." Schleiden discussed his findings with zoologist Theodor Schwann […] Swann, too, had observed that animal tissues has a system of organization visible only by microscope: they were built, unit by unit, out of cells. (Mukherjee 2022: 43–44)

This provides us with what he characterises as two founding tenets of cell biology:
1. All living organisms are composed of one or more cells.
2. The cell is the basic unit of structure and organization in organisms. (Mukherjee 2022: 45)

He goes on to describe how Schleiden and Swann's work was followed up by Virchow, who makes the crucial connection between physiology and pathology, adding three tenets to the two founding ones:
3. All cells come from other cells (*omnis cellula e celllula*)
4. Normal physiology is the function of cellular physiology.
5. Disease, the disruption of physiology, is the result of the disrupted physiology of the cell. (Mukherjee 2022: 50)

In doing so Mukharjee moves readers from common sense observations about differences between organisms and their substance to the uncommon sense understanding that the building blocks of all life are cells. From the perspective of field, he construes specialised composition.

4.1.2 Iconisation

As a popular science writer, Mukherjee does not of course leave us there. He also has the task of celebrating the achievements of the scientists involved and their discoveries. This means we need to bring interpersonal meaning into the picture – to show how value is added to knowledge via a process we refer to as **iconisation** (Martin 2010).

Mukherjee (2022) begins his book for example with a story about Schleiden and Swann coming to the realisation of tenets 1 and 2 in conversation over dinner in October 1837. We get to know the two as "intimate colleagues, collaborators, and friends", not just faceless scientists in a lab peering through a microscope. Later on he appreciates the five tenets noted above as revolutionary pillars of cell biology and medicine:

> These five principles would form the pillars of cell biology and cellular medicine. They would revolutionize our understanding of the human body as assemblages of these units. They would complete the atomic conception of the human body, with the cell as the fundamental, "atomic" unit. (Mukherjee 2022: 50)

Further on still he quotes two paragraphs from Virchow (Mukherjee 2022: 50) that he keeps pinned on the board in his office, waxing metaphorically that they are the two melodies that infuse his book (riffing on the title of this book, *The Song of the Cell*):

> "Life is, in general, cell activity. Beginning with the use of the microscope in the study of the organic world, far-reaching studies […] have shown that all plants and animals are, in the beginning […] a cell within which other cells develop to give rise to new cells that together, undergo transformation to new forms, and finally […] constitute the amazing organism."

> "Every disease depends on an alternation of a larger or smaller number of cellular units in the living body, every pathological disturbance, every therapeutic effect, finds its ultimate explanation only when it's possible to designate the specific living cellular elements involved."

> These two paragraphs – the first proposing the cell as a unit of life and physiology, and the second proposing the cell as the unit locus of disease – are pinned on the board in my office. In thinking about cell biology, cellular therapies, and the building of new humans out of cells, I inevitably return to them. They are, as it were, the twin melodies that ring through this book.

Taken to extremes, adding value leads to the creation of what Stenglin calls bonding icons (bondicons for short) – radiating symbols that rally communities (see Stenglin [2022] for a review of her work on bonding). Mukherjee (2022) has probably not done enough work to iconise Schleiden, Swan and Virchow as gurus for most of his readers, especially when we compare them with renowned researchers such as Watson and Crick (the problematic nature of their primary recognition in relation to Rosalind Franklin, and James Watson's later controversial statements notwithstanding). But keen readers have been positioned to remember them and the significance of their insightful discoveries. In general terms, the point we are making here is that specialised knowledge involves both understandings and their value.

4.1.3 Aggregation

Turning to textual meaning, another important dimension of mass is what we refer to as **aggregation** – a process whereby texts package their presentation of

knowledge and values. Mukherjee (2022: 18) for example uses deixis (*these*) and a pronoun (*them*) to consolidate a set of questions he poses in his prelude to Part 1 of his book:

> When did we realise that humans were, in fact composites of independent, living units? Or that these units are the basis of all the functions that the body is capable of – in other words, that our physiology reposes, ultimately, in cellular physiology? And conversely, when did we posit that our medical fates and futures were intimately linked to the changes in these living units? That our diseases are consequences of cellular pathology?
>
> It is to ↑**these questions** – and embedded within ↑**them**, the story of a discover that touched and radically transformed biology, medicine, and our conception of humans – that we first turn. (Mukherjee 2022: 18)

Later on, by way of wrapping up Part 1 Mukherjee (2022: 70–72) draws on these resources to help scaffold his consolidation of what he has told us in relation to what he can't. His information flow in this part of the book is outlined below. He begins by noting that there are two stories to tell (i.e. the history of cell biology and the history of the cell). He then goes on to consolidate the history of cell biology, from the late 1600 to 1910 – introducing his review as *the first* (story) and culminating it as *that* (story). He then turns to the history of the cell, which he explores equivocally for several paragraphs, before concluding that *this second story* is in fact it is a tale he cannot tell. The arrows and layout below symbolise the ways in which the text looks forward and back as it unfolds.

> The division of life into its principal domains returns us to yet another essential distinction in the trajectory of our story of cells. There are, in fact, two intersecting stories here.
> ↓
>> **The first** is the history of cell biology.
>> ↓
>>> We have journeyed through vast territory in this first story: from Leeuwenhoek to Hooke visualising cells in the late 1600s, to the discovery of tissues and organs centuries later; and from the discovery of bacteria as a cause of putrefaction and disease by Pasteur and Koch to Erlich's synthesis of this first antibiotics in 1910. We've moved from the origins of cellular physiology – Raspail's luminously prescient "Every cell is [...] a kind of laboratory" – to the young Virchow's brazen proposition that the cell is the locus of both normal physiology and pathology.
>> ↑
>> But **that** is the history of cell biology, not the history of the cell.
> ↓
>> The cell's history dwarfs that of cell biology by billennia.
>> ↓
>>> The first cells – the earliest, most primitive forms of our ancestors – arose on earth some 3.5–4 billion years ago, about 700 millions years after the birth of the Earth. [...]
>> ↑

But there is one question what we will not, and perhaps, cannot answer. The origin of the cell is an evolutionary mystery. […] it is **this second story** – of the origin of our cells – that neither this book, nor evolutionary science, can faithfully convey.

(Mukherjee 2022: 70–72)

4.1.4 Technicality, iconisation, and aggregation

We're now in position to summarise the metafunctional perspective on mass presented above. From the perspective of ideational meaning, the key variable is **technicality** – to what extent is meaning distilled as technical terms arranged as uncommon sense property, classification, composition, and activity? From the perspective of interpersonal meaning the key variable is **iconization** – to what extent is knowledge charged with values shared by members of a community? From the perspective of textual meaning the key variable is **aggregation** – to what extent does a text consolidate meaning, prospectively or retrospectively, as it unfolds? Table 3 summarises this metafunctional factoring of mass as technicality, iconization, and aggregation.

Table 3: Perspectives on mass.

Metafunction	Perspective
Ideational	Technicality
Interpersonal	Iconization
Text	Aggregation

4.2 Association (status/contact)

The tenor specialist whose work most strongly reflects a concern with patterns of usage is Poynton (1984, 1985, 1990, 1996). In her PhD thesis (1990) she refers to these patterns as reciprocity, proliferation, and contraction. Reciprocity refers to the tendency for interlocutors with equal status to take up the same kind of linguistic choices and for interlocutors with unequal status to draw on different ones (the influence of Brown and Gilman's [1960] canonical study of pronouns is apparent here). Poynton's research focused on naming and highlights the contrast between reciprocal usage (e.g. both using first names: *Kate/Gunther*) and non-reciprocal usage (e.g. one using title + surname and the other using first name: *Dr. Smith/Gunther*). Proliferation refers to the tendency for interlocutors to take up a wider range of

choices the better they know one another (e.g. the names that a distant work acquaintance may use for one of the authors, e.g. *Dr. Yaegan Doran*, vs. the names his mother uses for him, e.g. *Yaegan, Yaegan John, Yaegan John Doran, Yaeg, Yaegy J, Yaegy JJ, Yaegy JJJ, Yaegy JJJJJ, B, BB, my B, my BBBBB* – with all the nuance in warmth or warning that each choice entails). Poynton also notes the concomitant tendency to prefer more contracted realisations (e.g. *Yaeg* vs. *Dr. Yaegan Doran*) the more contact we have with one another.

Martin (1992: 529, 532) provides more detail on the language systems in play as far as Poynton's patterns of usage are concerned, concentrating on interpersonal systems. But even there textual systems (e.g. rhythm, homophora) and ideational systems (e.g. agency, technical lexis) are brought in to provide a more complete picture. This suggests that as far as social relations are concerned, a multi-functional perspective will prove useful. Below we suggest a framework for what we will refer to as association – comprising ideational (participation), interpersonal (accord), and textual (coordination) patterns of usage as interlocutors enact relations of status and contact with one another.

4.2.1 Participation (as colleagues, associates, teammates, co-workers, comrades …)

From an ideational perspective we are concerned with what we will generalise as participation – i.e. undertaking or discussing some domestic or institutionalised activity (e.g. at home, at work, in recreation, in worship). These activities involve shared knowledge about what to do and who or what is involved. The more you understand the more you are part of the group. As far as language is concerned, a lot of such knowledge is encoded in specialised or technical lexis that only insiders can follow and whose development depends on informal and formal mentoring practices. As the biology teacher comments below, mentoring her students as she goes, scientists like using new words.

Teacher	And protein. So basically, it's still not […] ah, not foiled. Coiled. Sorry, I don't know why I keep using foiled. It's not coiled. Yes? It's just long, unwound, loose mass of DNA. So, […] and because the scientists, they like using new words, so they are calling it, what?
Student	Chromatin.

In a science classroom reciprocity will be reflected in the difference between teachers' and students' control of technical terms such as *mitosis, anaphase, chromatids, spindle fibres, microtubules, organelle, centrioles, centromere, chromosomes, nuclei, and centrosome*, with students assuming more control over time in successful teaching/learning cycles. The terminology will proliferate as lessons unfold, with terms like *mitosis* ultimately contracting understanding of cell division, just as *interphase*

contracts understanding of what is going on a lower tier of activity. Some of this activity is spelled out below, drawing on connexion to make the relevant links (in bold).

Teacher	[reads from whiteboard] **When** a cell divides during mitosis, some organelles are divided between the two daughter cells. **For example**, mitochondria are capable of growing and dividing **during** the interphase stage, **so** the daughter cells each have enough mitochondria. Obviously **to** do what?
Student	Create energy.
Teacher	Create energy, thank you.

4.2.2 Accord (as besties, friends, mates, cronies, familiars, acquaintances, social networkers …)

From an interpersonal perspective we are concerned with what we will generalise as accord – i.e. sharing feelings about people and things and cooperating in dialogue. Shared feelings may involve emotional reactions to triggers of various kinds, judgements of people's character and behaviour and the value of 'things' (including natural phenomena, books, films, songs, performances, and so on).

In a science classroom reciprocity will be reflected in the teacher's evaluation of student knowledge and behaviour – adjudicated as right or wrong. In the interaction below student responses are continually assessed, at times affirmed through repetition and at others explicitly commented on (in bold). It is only the teacher who inscribes how she feels.

Teacher	Before we begin – can anyone suggest what this is on the board? [an artistic impression of cell image on board] Yes?
Student	Is the top one Anaphase?
Teacher	Anaphase? Can you describe what's happening there?
Student	The chromatids are being pulled apart.
Teacher	The chromatids are being pulled apart [hand gestures showing pulling apart action] Yep. And what's pulling apart? Someone put their hand up.
Student	Spindle fibres.
Teacher	Spindle fibres. What are spindle fibres made of?
Student	Micro tubules.
Teacher	**Cool**. What's the organelle [hands gesture a container – all fingertip-to-fingertips] that contains the centrioles?
Student	Centrome […].
Teacher	**Close** – the centromere. What's the centromere?
Student	Is that the one with the chromosomes?
Teacher	Yeah – **very, very, close.**

(continued)

Student	Nuclei.
Teacher	I was asking what the organelle is [repeat hand gesture for container] that contains the centrioles inside of it?
Student	Wait – isn't it the centrosome?
Teacher	Yep, the centrosome – the way I remember this is – inside the centre [repeat hand gesture for container] of the centrosome is some […] [deliberate pause] [repeat hand gesture for container] some what? Inside the centrosome [repeat hand gesture for container] is […] again?
Student	Centrioles
Teacher	Centrioles. **Right. Sweet. Okay cool.** How can suggest what these stages are? [TD moves cursor on whiteboard to image]

This classroom's interaction is at the same time a cooperative one – a well-rehearsed routine based on hours of teacher/student contact over years of schooling.

Proliferation is reflected in the range of feelings shared in relation to the range of triggers and targets. In the lesson we are taking examples from here, a wide range of inscribed attitude is used to assess students' ability to respond with the right answer and thereby propel the lesson along – *including cool, right, sweet, cool, awesome, great, nice,* and *beautiful.* At the same time, correct answers are generally affirmed through repetition (*And what's pulling them apart? – Spindle fibres. – Spindle fibres.*). For these assessments, which involve invoked attitude, the students infer that the answer is correct – a pattern of contracted usage as far as negotiating is concerned.

4.2.3 Coordination (as partners, family, housemates, flatmates, companions, caregivers …)

From a textual perspective, we are concerned with what we will generalise as co-ordination – involving taken for granted understandings smoothing the flow of discourse based on the experience of 'kith and kin' spending time together, and the relative control over the textual organisation of a text. Homophoric reference is a strong marker of taken-for-granted understandings of association since it identifies entities that are not necessarily accessible from the co-text or material context of an utterance. Familiar examples from domestic situations would be presuming reference such as *the fridge, the car, the bathroom, the yard,* and so on (where it would be ridiculous to say *there's a fridge in the kitchen; grab some beer from it,* unless there were another fridge elsewhere that might be confused with it). As far as proliferation is concerned, the more that can be presumed, the closer the relationship.

There's not a lot of homophoric reference in the lesson we are focussing on. But the teacher does presume knowledge about the groups she expects students to move into later on in the lesson.

Teacher	I'm going to give you some materials so when we jump into **our groups** you're going to construct a model for the stages.

And familiarity with the Golgi apparatus is also presumed.

Teacher	**The Golgi apparatus**, however, breaks down before mitosis and reassembles in each of the new daughter cells.

Additional markers of close contact include ellipsis and contraction in grammar and fast speech processes in phonology (which reduce syllable structure, increase the number of non-salient syllables in feet, and pack more than one clause into a tone group). Acronyms bring graphology into the picture, as word complexes are reduced to initials. Familiar acronyms from cell biology include deoxyribonucleic acid (DNA) and ribonucleic acid (RNA), and more recently, as a result of the development of covid vaccines, messenger RNA (mRNA). Our lesson draws on one of these below.

Teacher	And protein. So basically, it's still not […] ah, not foiled. Coiled. Sorry, I don't know why I keep using foiled. It's not coiled. Yes? It's just long, unwound, loose mass of **DNA**. So, […] and because the scientists, they like using new words, so they are calling it, what?
Student	Chromatin.

This resource has proliferated on social media in recent decades, bonding users and excluding troglodytes – LOL (laugh out loud), ASAP (as soon as possible), BTW (by the way), IMHO (in my humble opinion), BRB (be right back), DYK (do you know), ATM (at the moment), FOMO (fear of missing out), SMH (shaking my head) etc. These facilitate the exchange of information in the circumscribed texts composed as text messages, Instagram captions, and tweets. As Zappavigna and Logi (in press) show, emojis can be interpreted in terms of proliferation and contraction along the same lines.

In classroom discourse textual reciprocity is perhaps most strongly reflected in the control the teacher has over higher level periodicity. Below she prefaces her lesson with a Macro-Theme telling the class what they're going to do.

Teacher	What we're going to do today is model a representation of mitosis as a point of reference to explain these stages. [a static image on whiteboard from 'Cells alive animation'] I'm going to give you some materials so when we jump into our groups you're going to construct a model for the stages. What I have is some paper. I have some pipe cleaners, I have some masking tape, and I have some string – all the things you guys need to construct this model.

And in the following example she prefaces her reading activity:

Teacher	So I'm just going to read this [reads from whiteboard]
	When a cell divides during mitosis, some organelles are divided between the two daughter cells. For example, mitochondria are capable of growing and dividing during the interphase stage, so the daughter cells each have enough mitochondria. Obviously to do what?

Control of this kind of information flow is a strong marker of social status.

4.2.4 Participation, accord, coordination

We're now in position to summarise the metafunctional perspective on association presented above. From the perspective of ideational meaning, the key variable is **participation** – to what extent to people share understandings about what to do and who or what is involved? From the perspective of interpersonal meaning the key variable is **accord** – to what extent are feelings shared, explicitly and implicitly, about what is going on, and how cooperative are speakers where interaction is involved? From the perspective of textual meaning the key variable is **coordination** – to what extent do speakers smooth the flow of discourse by taking for granted information that is shared? Table 4 summarises this metafunctional factoring of association as participation, accord, and coordination.

Table 4: Perspectives on association (status/contact).

Metafunction	Perspectives
Ideational	Participation
Interpersonal	Accord
Text	Coordination

4.3 Presence

Responding to Maton's (2014: 110) characterisation of context-dependence as involving "processes of strengthening semantic gravity, such as moving from abstract or generalized ideas towards concrete and delimited cases, and weakening semantic gravity, such as moving from the concrete particulars of a specific case towards generalizations and abstractions whose meanings are less dependent on context", we have revisited work on context dependency in SFL to include ideational and interpersonal perspectives alongside the more traditional textual ones. As noted

above, taken together, the contributions from the different metafunctions are referred to as presence (Martin and Matruglio [2013] who draw on earlier work on context dependency by Martin [1983, 1984, 1992] and Cloran [1994, 1999a, 1999b, 2000]). This problematizes concerns in SFL for the cline between action and reflection (e.g. Martin [1984] and related concerns in the work of Hasan [1999] and Cloran [1994]), and monologue versus dialogue, acknowledging that they do not simply impinge upon textual meanings, but meanings across all metafunctions.

4.3.1 Iconicity

From an ideational perspective, we are concerned with **iconicity** – the degree to which a text matches what it is talking about. For a lesson on mitosis for example, we can ask to what extent the teacher proceeds step-by-step through the stages as they unfold (e.g. from interphase, through prophase, metaphase, and anaphase to telophase) or whether the class moves around a bit or works backwards chronologically, beginning with the telophase where the nuclear membrane reforms as the cell divides and working back towards the originating single cell.

We can also ask questions about iconicity with respect to the organisation of single events. In the following example, the teacher first refers to what happens in the synthesis stage as *you duplicate the chromosome* – with what happens construed as a verb (*duplicate*). The absence of this process before synthesis in her following comment is rephrased as *without duplication into the chromosome* – with what happens construed as a noun (*duplication*). In the initial phrase the grammar matches what happens more closely than in the second, since the event is realised verbally rather than nominally. The advantages of the less iconic nominalised discourse have been a key focus of research in SFL as far as knowledge building in science is concerned (e.g. Halliday 2004; Halliday and Martin 1993; Hao 2020; Martin and Veel 1998).

Teacher	Yeah but we're just kind of hypothetically thinking before you go into the synthesis stage where you **duplicate** the chromosome you would suggest that you would see the chromatids without **duplication** into the chromosome.

4.3.2 Negotiability

From an interpersonal perspective, we are concerned with **negotiability** – the extent to which texts engage speakers with listeners as they unfold. This links with long-standing concerns within SFL between variation associated with monologue versus dialogue. In the previous example, taken from face-to-face classroom interaction, we find 1st and 2nd person exophoric pronouns referring to the teacher and

students involved (in bold below) – pronouns which tie the text more closely to the 'here and now' than endophoric third person ones.

Teacher	Yeah but **we**'re just kind of hypothetically thinking before **you** go into the synthesis stage where **you** duplicate the chromosome **you** would suggest that **you** would see the chromatids without duplication into the chromosome.

This draws our attention to the 'to and fro' of face-to-face interaction, as speakers initiate exchanges and respond. The familiar Initiation-Response-Feedback (IRF) cycles of pedagogic discourse illustrate this point – as teacher and students engage in question, answer, evaluation cycles.

Teacher	Inside the centrosome is … again?
Student	Centrioles.
Teacher	Centrioles.
	Right. Sweet. Okay cool.

Note that in exchanges of this kind the teacher and students are not just engaging in dialogue; they are sharing attitudes as well. In her evaluation above, the teacher appreciates the student's answer as *correct*; and she in addition judges the student's responsive behaviour, as *sweet* and *cool*. Evaluation of this kind, targeting as it does both the content of the student's reply and their cooperative behaviour is arguably more engaging that attitude targeting non-interlocutors. In the example below, feelings are being exchanged about an image, not the performance of a student.

Teacher	So for example I found this online – that's a little bit of a **misconception** here. That's a **really beautiful** image, but there's something **wrong** with it.

As illustrated by the following example, engaged interaction of this kind makes room for repair, and an apology, as a student picks up on the teacher's miscue when reading from the textbook (from Ngo et al. 2022b: 1022).

Teacher	Each centriole is a ring of nine groups of microtubules.
	There are nine microtubules in each group
Student	**three**
Teacher	**three, sorry.**
	There are three microtubules in each region group. Microtubules and centrioles are part of the cycle.
	In the complete animal cell centrosome, the two centrioles arrange themselves such that one is perpendicular to the other.
(Ngo et al. 2022b: 1022)	

Our general point here is that the more interactive an exchange, and the more it involves an negotiation of feeling, the stronger its presence.

4.3.3 Implicitness

This brings us to SFL's more traditional concern with context dependency – focusing on the extent to which a text uses words that point to its sensory environment – to what people can see, hear, touch, taste or feel. We will use the term **implicitness** to refer to the degree to which texts depend on context in these deictic terms. The contrast in play here is illustrated in the example below (from Ngo et al. 2022b: 1022) which has endophoric deixis (*that* and *it*) referring to text that the teacher has just read to the class (marked by the upwards pointing arrows) alongside exophoric deixis (*this, this, here, this*) pointing to an image the class is working on (marked by curved arrows below).

Teacher   Now I want to look at what that looks like.

It looks something like **this**

This is an electron micrograph.

As you can see **here** – there are – should be nine.

One, two, three, four, five, six, seven, eight, nine.

This is a real image.

(Ngo et al. 2022b: 1022)

Exophoric reference of this kind is a long-standing measure of the context dependency of a text, in both sociological and linguistic research (e.g. Hawkins 1977; Martin 1983). The items in bold above are relatively implicit and to fully interpret their meaning you have to know what they are referring to – in this case to a science teacher and her students, who are looking at a model of a cell projected onto a smart board. For texts like this there is a sense in which to fully understand them you had to be there (for the lesson) or have someone explain what was going on (as we have just done). Texts which don't make exophoric reference of this kind are relatively context independent.

4.3.4 Iconicity, negotiability, and implicitness

We're now in position to summarise the metafunctional perspective on presence introduced in this section. From the perspective of ideational meaning, the key variable is **iconicity** – to what extent does a text unfold by mirroring what it is talking

Table 5: Perspectives on presence.

Metafunction	Perspectives
Ideational	Iconicity
Interpersonal	Negotiability
Textual	Implicitness

about (e.g. realising what is going on by using verbs or by using nouns)? From the perspective of interpersonal meaning, the key variable is **negotiability** – to what extent does a text engage people in the 'to and fro' of dialogue, including the amount of attitude expressed and how it is triggered or targeted? From the perspective of textual meaning, the key variable is **implicitness** – to what extent does a text depend on exophoric reference to its sensory environment? Table 5 summarises this metafunctional factoring of presence in language as implicitness, negotiability, and iconicity.

5 Perspectives on context

SFL has been concerned with the relation between language and context throughout its 60-odd year history. This has produced a range of models and highlighted a breadth of phenomena that must be accounted for if we are to develop a truly *social* semiotics. For much of the history of SFL, there has been only three variables used to model context: field, tenor, and mode. But over the last few decades, our theoretical architecture has expanded. The context plane has been expanded to include genre (Martin and Rose 2008). Our understanding of the system of language in relation to the instance has become more nuanced through the development of the cline of instantiation (Halliday 1991a; Matthiessen 1993). And our modelling of how resources in language get differentially distributed across society (allocation) and how people use language to build community (affiliation) has opened up via the scale of individuation (Martin 2010). Until these dimensions were elaborated, field, tenor, and mode were expected to do all of the heavy lifting when it comes to our modelling of context. But as we noted above, recognising the dimensions of instantiation and individuation in addition to realisation allows us to distribute the work. In doing so, we are able to make theoretically clearer distinctions between aspects of 'context', while holding onto the context/metafunction resonance Halliday proposed to underpin SFL modelling.

Under the model presented in this paper, field, tenor, and mode have been reconceptualised in terms of realisation as meaning making resources. Field has been presented as a resource for construing phenomena, tenor as a resource for

enacting sociality, and mode as a resourcing for composing texture. This has been done in such a way that we can maintain context/metafunction resonance – it means that the resources of field are more closely tied to ideational meanings in language, the resource of tenor are more closely tied to interpersonal meanings, and the resources of mode are more closely tied to textual meanings than have otherwise been the case. Although we could not explore this in detail here, these resources have also been designed to link more closely with patterns of genre (see Doran et al. [2024] for exploration of this for tenor, and Doran and Martin [2021] for field).

In terms of instantiation, this model focuses on how different choices are brought together and sequenced. More technically, it is concerned with the principles that underpin couplings. It has long been acknowledged that choices in language are not put together in a random fashion, but work together to build meaning. This is, of course, the basis of Halliday's conception of register. The current model aims to make explicit the principles determining how these choices come together. Importantly, it arises from an acknowledgement that these principles are not tied to any particular metafunction but are cross-metafunctional. Reconsidering the variation between more technical and more everyday discourse – often positioned within field – we have presented the variable of mass. Mass offers a means of conceptualising how much 'meaning' is presented in a particular instance (influenced by Maton's [2014] conception of semantic density), whether that be ideational, interpersonal, and textual, and the differing language resources used to present this variation in the strength of meaning. Reconsidering the social relations of contact and status – what has often been positioned within tenor – we have presented association. Association presents cross-metafunctional principles for organising the reciprocity of choice or lack thereof that marks similarities or differences in status, and the contraction and proliferation that mark differing levels of social contact. And reconsidering variation in 'abstraction' or 'concreteness' – often positioned within mode – we have presented the principle of presence. Presence presents a cross-metafunctional understanding of context-dependence (influenced by Maton's [2014] semantic gravity). This considers the degree to which texts iconically match what it is talking about (ideational iconicity), the degree to which texts engage with the audience as it goes (interpersonal negotiability), and the degree to which texts relate out to the situation they are in (textual implicitness).

These principles – mass, presence, and association – are by no means the only ones that organise how we take up different sets of choices from the immense set of possibilities in language. At the very least, other principles include that of *convergence* – how much different choices in a text 'match' each other or 'diverge' from each other (intralingually, interlingually, and/or intermodally) – which has been primarily taken up so far in studies of how different semiotic resources are used together (e.g. Ngo et al. 2022a; Painter et al. 2013; Zappavigna and Logi in press); and

how sharply or softly boundaries are created around different meanings, what we might tentatively call *bounding*, influenced by what Bernstein (1975) calls classification, and what has been elaborated by Maton (2014) and Maton and Howard (2018) in terms of Specialisation and Autonomy.

As our survey has indicated, our understanding of instantiation is only at an incipient stage. But it already can offer new perspectives on long-standing challenges regarding how language engages with broader society. For example, when it comes to understanding change over time, whether phylogenetic, ontogenetic, or logogenetic, it offers a view not in terms of snapshots of the sets of resources used at particular times, but in terms of the principles that drive them. For example, in terms of Halliday's classic study of the phylogenetic development of scientific language (1988), we can interpret the growth in the use of elaborated nominal groups, interlocking definitions and eventually the development of grammatical metaphor as being driven by a need for increased mass – for greater connections between meanings than had previously been possible. Or within a text, these principles offer a linguistic perspective on the variations in complexity and context-dependence that Maton (2013) calls semantic waves, and has recognised as a key to cumulative knowledge-building.

One component of this model we have not commented on in detail here is that of individuation (Martin 2010). This dimension focuses on how language varies within a community, from the entire reservoir of meanings in a language community, to the individual repertoire of a person. In so doing, it considers how different language resources are distributed across different segments of society (allocation) and how people use language to come together and build community (affiliation). Viewed from individuation, field, tenor, and mode can be considered perspectives on arenas and domains of variation, contestation, and collaboration. For example, from the perspective of tenor, we can consider domains of sociality, such as the specific social relationships and the variation inherent in how they are managed. Hasan's (2009b) and Cloran's (1989) in-depth studies of variation in mother-child dialogue in relation to class and gender, offer the most detailed SFL studies in this regard at a societal level. From this perspective, we could also consider the sets of values at play in particular domains (what Maton [2014] calls axiological constellations) and how they organise people into different communities (e.g. Doran 2020a, 2020b). From the perspective of field, we can consider domains of experience, such as the specific disciplines in school that much SFL education work has devoted itself to, including the sets of knowledge that underpin them (what Maton [2014] calls epistemological constellations). Examples of this work include that of science as a school subject (e.g. Doran 2018; Halliday and Martin 1993; Hao 2020; Martin and Unsworth 2024; Martin and Veel 1998; Maton et al. 2021; Yu 2021). From the perspective of mode, we can consider domains of affordance, such as the media and channels that constrain and

enable our possibilities for communication. A rich example of this work for modern communication includes the work by Zappavigna and colleagues on various forms of social media (e.g. Zappavigna 2012, 2018; Zappavigna and Logi in press).

All this is to say, the way language redounds with society is rich and multifaceted. As a theory that aims to build a model of social semiosis, as SFL does (Halliday 1978), theoretical and descriptive space is needed for modelling language and society's nuanced interconnections. In this paper we have tried to open some of this space. But as the survey above has shown, there is much to be done. Halliday (1985: x) described his vast *Introduction to Functional Grammar* as but a "thumbnail sketch" of English grammar; given the size of this paper and the scope of its ambition, we are scarcely even offering a thumbnail cell sketch here. We do hope that others can join us, and help SFL develop its potential – as the appliable linguistics we need to help make our world a better place.

References

Bartlett, Tom & Gerard O'Grady (eds.). 2017. *The Routledge handbook of systemic functional linguistics*. London: Routledge.

Bernstein, Basil. 1975. *Class, codes and control, volume III: Towards a theory of educational transmission*. London: Routledge.

Berry, Margaret. 1981a. Systemic linguistics and discourse analysis: A multi-layered approach to exchange structure. In Malcolm Coulthard & Martin Montgomery (eds.), *Studies in discourse analysis*, 120–145. London: Routledge.

Berry, Margaret. 1981b. Towards layers of exchange structure for directive exchanges. *Network* 2. 23–32.

Bowcher, Wendy. 2019. Context and register. In Geoff Thompson, Wendy L. Bowcher, Lise Fontaine & David Schönthal (eds.), *The Cambridge handbook of systemic functional linguistics*, 142–170. Cambridge: Cambridge University Press.

Brown, Roger & Albert Gilman. 1960. The pronouns of power and solidarity. In Thomas Sebeok (ed.), *Style in language*, 253–276. Cambridge, MA: MIT Press.

Carr, Georgia. 2023. *With respect to consent: The language of sex education*. Sydney: The University of Sydney PhD thesis.

Chen, Lin. 2024. *Knowledge building in tertiary medical science*. Sydney: The University of Sydney PhD thesis.

Christie, Frances & James R. Martin (eds.). 2007. *Language, knowledge and pedagogy: Functional linguistic and sociological perspectives*. London: Continuum.

Christie, Frances & Karl Maton (eds.). 2011. *Disciplinarity: Functional linguistic and sociological perspectives*. London: Continuum.

Cloran, Carmel. 1989. Learning through language: The social construction of gender. In Ruqaiya Hasan & James R. Martin (eds.), *Language development: Learning language, learning culture*, 111–151. Norwood: Ablex.

Cloran, Carmel. 1994. *Rhetorical units and decontextualisation: An enquiry into some relations of context, meaning and grammar*. Nottingham: University of Nottingham.

Cloran, Carmel. 1999a. Contexts for learning. In Frances Christie (ed.), *Pedagogy and the shaping of consciousness: Linguistic and social processes*, 31–65. London: Cassell.

Cloran, Carmel. 1999b. Context, material situation and text. In Mohsen Ghadessy (ed.), *Text and context in functional linguistics*, 177–217. Amsterdam: Benjamins.

Cloran, Carmel. 2000. Socio-semantic variation: Different wordings, different meanings. In Len Unsworth (ed.), *Research language in schools and communities: Functional linguistic perspectives*, 152–183. London: Cassell.

Doran, Yaegan J. 2018. *The discourse of physics: Building knowledge through language, mathematics and image*. London: Routledge.

Doran, Yaegan J. 2020a. Seeing values: Axiology and affording attitude in Australia's 'invasion'. In James R. Martin, Karl Maton & Yaegan J. Doran (eds.), *Accessing academic discourse: Systemic functional linguistics and legitimation code theory*, 151–176. London: Routledge.

Doran, Yaegan J. 2020b. Cultivating values: Knower-building in the humanities. *Estudios de Lingüística Aplicada* 37(70). 169–198.

Doran, Yaegan J. 2024. Interpreting history: Valuing events in a post-colonial world. In Jing Hao & James R. Martin (eds.), *The discourse of history: A systemic functional perspective*. Cambridge: Cambridge University Press.

Doran, Yaegan J. & James R. Martin. 2021. Field relations: Understanding scientific explanations. In Karl Maton, James R. Martin & Yaegan J. Doran (eds.), *Teaching science: Knowledge, language, pedagogy*, 105–133. London: Routledge.

Doran, Yaegan J., James R. Martin & Michele Zappavigna. 2024. *Affiliation and systemic functional linguistics: Negotiating community*. London: Equinox.

Eggins, Suzanne & Diana Slade. 1997. *Analysing casual conversation*. London: Cassell.

Firth, John R. 1957. *Papers in linguistics* 1934–1951. London: Oxford University Press.

Fries, Peter. 1995. Themes, methods of development, and texts. In Ruqaiya Hasan & Peter Fries (eds.), *On subject and theme: A discourse functional perspective*, 317–359. Amsterdam: John Benjamins.

Gregory, Michael. 1967. Aspects of varieties differentiation. *Journal of Linguistics* 3. 177–198.

Halliday, Michael A. K. 1975. Language as social semiotic. In Adam Makkai & Valerie B. Makkai (eds.), *The first LACUS forum*, 241–292. Columbia, SC: Hornbeam Press.

Halliday, Michael A. K. 1978. *Language as social semiotic: The social interpretation of language and meaning*. London: Arnold.

Halliday, Michael A. K. 1979. Modes of meaning and modes of expression: Types of grammatical structure, and their determination by different semantic functions. In David J. Allerton, Edward Carney & David Hollcroft (eds.), *Function in context in linguistic analysis: A festschrift for William Haas*, 57–79. Cambridge: Cambridge University Press.

Halliday, Michael A. K. 1985. *An introduction to functional grammar*. London: Arnold.

Halliday, Michael A. K. 1988. On the language of the physical sciences. In Mohsen Ghadessy (ed.), *Registers of written English: Situational factors and linguistic factors*, 162–178. London: Pinter.

Halliday, Michael A. K. 1991a. Towards probabilistic interpretations. In Eija Ventola (ed.), *Functional and systemic linguistics: Approaches and uses*, 39–61. Berlin: Mouton de Gruyter.

Halliday, Michael A. K. 1991b. Corpus studies and probabilistic grammar. In Karin Aijimer & Bengt Altenberg (eds.), *English corpus linguistics: Studies in honour of Jan Svartvik*, 30–43. Harlow: Longman.

Halliday, Michael A. K. 2004. *The language of science*. London: Bloomsbury.

Halliday, Michael A. K. & William S. Greaves. 2008. *Intonation in the grammar of English*. London: Equinox.

Halliday, Michael A. K. & Ruqaiya Hasan. 1976. *Cohesion in English*. London: Longman.

Halliday, Michael A. K. & Ruqaiya Hasan. 1985. *Language, context, and text: Aspects of language in a social-semiotic perspective*. Geelong: Deakin University Press.

Halliday, Michael A. K. & James R. Martin (eds.). 1993. *Writing science: Literacy and discursive power*. London: Falmer Press.

Halliday, Michael A. K. & Christian M. I. M. Matthiessen. 2014. *Halliday's introduction to functional grammar*, 4th edn. London: Routledge.

Hao, Jing. 2020. *Analysing scientific discourse from a systemic functional linguistic perspective: A framework for exploring knowledge-building in biology*. New York: Routledge.

Hasan, Ruqaiya. 1995. The conception of context in text. In Peter H. Fries & Michael Gregory (eds.), *Discourse in society: Systemic functional perspectives*, 183–284. Norwood, NJ: Ablex.

Hasan, Ruqaiya. 1999. Speaking with reference to context. In Mohsen Ghadessy (ed.), *Text and context in functional linguistics*, 219–328. Amsterdam: Benjamins.

Hasan, Ruqaiya. 2009a. The place of context in a systemic functional model. In Jonathan J. Webster (ed.), *Continuum companion to systemic functional linguistics*, 166–189. London: Continuum.

Hasan, Ruqaiya. 2009b. *Semantic variation: Meaning in society and in sociolinguistics*. London: Equinox.

Hasan, Ruqaiya. 2014. Towards a paradigmatic description of context: Systems, metafunctions, and semantics. *Functional Linguistics* 1. 9.

Hasan, Ruqaiya. 2015. Systemic functional linguistics: Halliday and the evolution of a social semiotic. In Jonathan J. Webster (ed.), *The Bloomsbury companion to M.A.K. Halliday*, 101–134. London: Bloomsbury.

Hasan, Ruqaiya. 2016. *Context in the system and process of language*. London: Equinox.

Hasan, Ruqaiya. 2020. Tenor: Rethinking interactant relations. *Language, Context and Text: The Social Semiotics Forum* 2(2). 213–233.

Hawkins, Peter R. 1977. *Social class, the nominal group and verbal strategies*. London: Routledge.

Kim, Mira, James R. Martin, Gi-Hyun Shin & Gyung Hee Choi. 2023. *Korean grammar: A systemic functional approach*. Cambridge: Cambridge University Press.

Knight, Naomi. 2010. *Laughing our bonds off: Conversational humour in relation to affiliation*. Sydney: The University of Sydney PhD thesis.

Kress, Gunther & Theo van Leeuwen. 2020. *Reading images: The grammar of visual design*, 3rd edn. London: Routledge.

Logi, Lorenzo & Michele Zappavigna. 2022. Affiliation: An appliable framework for exploring community and identity in discourse. In David Caldwell, John Knox & James R. Martin (eds.), *Appliable linguistics and social semiotics: Developing theory from practice*, 325–340. London: Bloomsbury.

Martin, James R. 1983. The development of register. In Roy O. Freedle & Jonathon Fine (eds.), *Developmental issues in discourse*, 1–40. New Jersey: Ablex.

Martin, James R. 1984. Language, register and genre. In Frances Christie (ed.), *Children writing: Reader*, 21–30. Geelong: Deakin University Press.

Martin, James R. 1992. *English text: System and structure*. Amsterdam: Benjamins.

Martin, James R. 1999. Modelling context: A crooked path of progress in contextual linguistics. In Mohsen Ghadessy (ed.), *Text and context in functional linguistics*, 25–61. Amsterdam: Benjamins.

Martin, James R. 2001. A context for genre: Modelling social processes in functional linguistics. In Jessica de Villiers & Robert J. Stainton (eds.), *Communication in linguistics: Papers in honours of Michael Gregory*, 287–328. Toronto: GRED.

Martin, James R. 2010. Semantic variation: Modelling system, text and affiliation in social semiosis. In Monika Bednarek & James R. Martin (eds.), *New discourse on language: Functional perspectives on multimodality, identity and affiliation*, 1–34. London: Continuum.

Martin, James R. 2013. *Systemic functional grammar: A next step in the theory – axial relations*. Chinese translation and extensions by Pin Wang & Yongsheng Zhu. Beijing: Higher Education Press.

Martin, James R. 2014. Evolving systemic functional linguistics: Beyond the clause. *Functional Linguistics* 1. 1–24.

Martin, James R. 2016. Meaning matters: A short history of systemic functional linguistics. *WORD* 61. 1–23.

Martin, James R. 2017. Revisiting field: Specialized knowledge in secondary school science and humanities discourse. *Onomázein Special Issue* II. 111–148.

Martin, James R. 2024. Coordinating meaning: Scaffolding teaching/learning in pedagogic discourse. In Jing Hao & James R. Martin (eds.), *The discourse of history: A systemic functional perspective*. Cambridge: Cambridge University press.

Martin, James R. & Karl Maton. 2017. Systemic functional linguistics and legitimation code theory on education: Rethinking field and knowledge structure. *Onomázein Special Issue* II. 12–45.

Martin, James R., Karl Maton & Yaegan J. Doran. 2020a. Academic discourse: An inter-disciplinary dialogue. In James R. Martin, Karl Maton & Yaegan J. Doran (eds.), *Accessing academic discourse: Systemic functional linguistics and legitimation code theory*, 1–31. London: Routledge.

Martin, James R., Karl Maton & Yaegan J. Doran (eds.). 2020b. *Accessing academic discourse: Systemic functional linguistics and legitimation code theory*. London: Routledge.

Martin, James R. & Erika Matruglio. 2013. Revisiting mode: Context in/dependency in Ancient History classroom discourse. In Guowen Huang, Delu Zhang & Xinzhang Yang (eds.), *Studies in functional linguistics and discourse analysis*, vol. 5, 72–95. Beijing: Higher Education Press.

Martin, James R. & David Rose. 2007. *Working with discourse: Meaning beyond the clause*. London: Continuum.

Martin, James R. & David Rose. 2008. *Genre relations: Mapping culture*. London: Equinox.

Martin, James R. & Len Unsworth. 2024. *Reading images for knowledge building: Analyzing infographics in school science*. London: Routledge.

Martin, James R. & Robert Veel (eds.). 1998. *Reading science: Critical and functional perspectives on discourses of science*. London: Routledge.

Martin, James R. & Peter R. R. White. 2005. *The language of evaluation: Appraisal in English*. London: Palgrave.

Maton, Karl. 2013. Making semantic waves: A key to cumulative knowledge-buidling. *Linguistics and Education* 24(1). 8–22.

Maton, Karl. 2014. *Knowledge and knowers: Towards a realist sociology of education*. London: Routledge.

Maton, Karl & Sarah K. Howard. 2018. Taking autonomy tours: A key to integrative knowledge building. *LCT Centre Occasional Paper* 1. 1–35.

Maton, Karl, James R. Martin & Yaegan J. Doran (eds.). 2021. *Teaching science: Knowledge, language, pedagogy*. London: Routledge.

Maton, Karl, Sueellen Shay & Sue Hood (eds.). 2016. *Knowledge-building: Educational studies in legitimation code theory*. London: Routledge.

Matthiessen, Christian M. I. M. 1993. Register in the round: Diversity in a unified theory of register analysis. In Mphsen Ghadessy (ed.), *Register analysis: Theory and practice*, 221–292. London: Pinter.

Matthiessen, Christian M. I. M., Kazuhiro Teruya & Canzhong Wu. 2008. Multilingual studies as a multidimensional space of interconnected language studies. In Jonathan J. Webster (ed.), *Meaning in context: Strategies for implementing intelligent applications of language studies*, 146–220. London: Continuum.

Matthiessen, Christian M. I. M, Bo Wang, Yuanyi Ma & Isaac Mwinlaaru. 2022. *Systemic functional insights on language and linguistics*. Singapore: Springer.

Moore, Alison R. 2017. Register analysis in systemic functional linguistics. In Tom Bartlett & Gerard O'Grady (eds.), *The Routledge handbook of systemic functional linguistics*, 438–456. London: Routledge.

Mukherjee, Siddhartha. 2022. *The song of the cell: An exploration of medicine and the new human*. London: Bodley Head.

Muller, Joe. 2000. *Reclaiming knowledge: Social theory, curriculum and education policy*. London: Routledge.

Muntigl, Peter. 2009. Knowledge moves in conversational exchange: Revisiting the concept of primary versus secondary knowers. *Functions of Language* 16(2). 225–263.

Ngo, Thu, Susan Hood, James R. Martin, Clare Painter, Bradley A. Smith & Michele Zappavigna. 2022a. *Modelling paralanguage using systemic functional semiotics: Theory and application*. London: Bloomsbury.

Ngo, Thu, Len Unsworth & Michele Herrington. 2022b. Teacher orchestration of language and gesture in explaining science concepts in images. *Research in Science Education* 52. 1013–1030.

Painter, Clare, James R. Martin & Len Unsworth. 2013. *Reading visual narratives: Image analysis in children's picture books*. London: Equinox.

Poynton, Cate. 1984. Names as vocatives: Forms and functions. *Nottingham Linguistic Circular* 13. 1–34.

Poynton, Cate. 1985. *Language and gender: Making the difference*. Geelong: Deakin University Press.

Poynton, Cate. 1990. *Address and the semiotics of social relations: A systemic-functional account of address forms and practices in Australian English*. Sydney: The University of Sydney PhD thesis.

Poynton, Cate. 1996. Amplification as a grammatical prosody: Attitudinal modification in the nominal group. In Margaret Berry, Christopher Butler & Robin Fawcett (eds.), *Meaning and form: Systemic functional interpretations*, 211–227. Norwood, NJ: Ablex.

Rose, David. 2020. The baboon and the bee: Exploring register patterns across languages. In James R. Martin, Yaegan J. Doran & Giacomo Figueredo (eds.), *Systemic functional language description: Making meaning matter*, 273–307. London: Routledge.

Stenglin, Maree. 2004. *Packaging curiosities: Towards a grammar of three-dimensional space*. Sydney: The University of Sydney PhD thesis.

Stenglin, Maree. 2022. Binding and bonding: A retrospective and prospective gaze. In David Caldwell, John Knox & James R. Martin (eds.), *Appliable linguistics and social semiotics: Developing theory from practice*, 309–324. London: Bloomsbury.

Tann, Ken. 2017. Context and meaning in the Sydney architecture of systemic functional linguistics. In Tom Bartlett & Gerard O'Grady (eds.), *The Routledge handbook of systemic functional linguistics*, 418–437. London: Routledge.

Thompson, Geoff, Wendy L. Bowcher, Lise Fontaine & David Schönthal (eds.). 2019. *The Cambridge handbook of systemic functional linguistics*. Cambridge: Cambridge University Press.

van Leeuwen, Theo. 1999. *Speech, music, sound*. Basingstoke: Macmillan.

Ventola, Eija. 1987. *The structure of social interaction: A systemic approach to the semiotics of service encounters*. London: Pinter.

White, Peter R. R. 2020. Attitudinal alignment in journalistic commentary and social-media argumentation: The construction of values-based group identities in the online comments of newspaper readers. In Michele Zappavigna & Shoshana Dreyfus (eds.), *Discourses of hope and reconciliation: On J. R. Martin's contribution to systemic functional linguistics*, 21–38. London: Bloomsbury.

Yu, Zhigang. 2021. *Exploring the knowledge-building of chemistry in secondary school chemistry textbooks: A multisemiotic perspective*. Shanghai: Tongji University PhD thesis.

Zappavigna, Michele. 2012. *The discourse of twitter and social media: How we use language to create affiliation on the web*. London: Continuum.

Zappavigna, Michele. 2018. *Searchable talk: Hashtags and social media metadiscourse*. London: Bloomsbury.

Zappavigna, Michele. 2019. Language and social media: Enacting identity through ambient affiliation. In
    Geoff Thompson, Wendy L. Bowcher, Lise Fontaine & David Schönthal (eds.), *The Cambridge
    handbook of systemic functional linguistics*, 715–738. Cambridge: Cambridge University Press.
Zappavigna, Michele & Lorenzo Logi. in press. *Emoji and social media paralanguages*. Cambridge:
    Cambridge University Press.
Zappavigna, Michele & James R. Martin. 2018. *Discourse and diversionary justice: An analysis of youth justice
    conferencing*. London: Palgrave Macmillan.
Zhang, Dongbing. 2020a. Towards a discourse semantic characterisation of the modal particles in
    Khorchin Mongolian: A case study of an interaction. *Journal of Pragmatics* 158. 13–32.
Zhang, Dongbing. 2020b. Dialogic positioning in Khorchin Mongolian: The temporal and spatial
    dimensions of propositional engagement in conversations. *Lingua* 244. 1–16.
Zhang, Dongbing. 2021. Dynamism in knowledge exchanges: Developing move systems based on
    Khorchin Mongolian interactions. *Discourse Studies* 233. 386–413.