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A Hallidayan approach

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COMMUNICATION & LANGUAGE at work

Operationalizing the Autonomy dimension of Legitimation Code Theory: A Hallidayan approach

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Abstract

This article is a theoretical one aimed at elaborating and operationalizing one of the more recently developed aspects of the educational theory named Legitimation Code Theory (LCT) (e.g. Maton 2014). LCT is a sociological theory with a markedly interventionist streak, which is reflected in endeavours to identify and recommend ways of removing obstacles to knowledge-building for learners. Out of three active dimensions in LCT, this article is focused on the particular dimension termed Autonomy. As applied to situations of knowledge communication, Autonomy appears to be concerned with the degree of insulation or focus with which a given topic is treated, i.e. whether the topic of, e.g., a school lesson, is 'autonomous' in that lesson or whether competing topics and perspectives are brought in to further the educational process. However, the concept of Autonomy is in need of both concretization and operationalization and will therefore be interpreted through the lens of certain aspects of Hallidayan linguistic theory that may fruitfully elucidate the concept. The operationalization will be exemplified through two cases of knowledge communication.

Keywords

Legitimation Code Theory, Systemic-Functional Linguistics, Autonomy, knowledge communication

1 Introduction

Situated at the intersection between linguistics and educational sociology, this article contributes to the exposition and operationalization of a particular dimension of the theoretical and analytical framework known as *Legitimation Code Theory* (LCT), namely the dimension of Autonomy (see below). LCT is a sociological framework for both *interpreting* and *informing* practice, with a special focus on contexts of knowledge communication. Inspired especially by the work of the late sociologists Pierre Bourdieu (e.g., 1991) and Basil Bernstein (e.g., 2003), LCT subsumes the perspectives of both scholars on how access to knowledge plays a role in achieving status or legitimacy in different social situations. In terms of its *interpretive* or analytical potential, LCT makes it possible to reveal the ‘codes of legitimation’ underlying educational contexts in particular, i.e. the codes legitimizing certain types of dispositions and disfavouring others in learners’ struggles for educational achievement (Maton, 2014, pp. 17-18). A central objective for LCT is thus to provide an explanatory framework (Maton, 2014) that may help educational researchers and practitioners identify and expose the tacit codes in specific practices, school subjects, curricula etc. that students need to master in order to attain educational success. Moreover, identifying such codes may serve as a steppingstone to informing practice, which is where LCT reveals its markedly interventionist streak. Indeed, echoing Karl Marx, Maton (2016, p. 3) stresses that “LCT is being used not only to interpret the world in various ways but also to change it.” This dedication to ‘change’ is reflected in various LCT-informed endeavours to identify and recommend ways of removing obstacles to knowledge-building, by encouraging certain types of communicative strategies in pedagogic contexts and discouraging others.

The ideal of providing all learners with a real chance of educational success is coupled with another central characteristic of LCT, which is opposition to what Maton (2014) denounces as ‘knowledge blindness’, i.e. the widespread tendency in modern pedagogical theory to ignore or to relativize knowledge as the object of learning. In contrast to subjectivist and ‘learner-centred’ theories such as constructivism, LCT encourages seeing knowledge as an object in its own right and at the same time as something that is socially constructed. In this way LCT “seeks to overcome the difficulties produced from viewing knowledge from the false dichotomy of either positive absolutism or constructionist relativism” (Matruglio, 2022, p. 23). This means that, in terms of pedagogical focus, LCT shifts the focus away from the psychological and cognitive aspects of the learning process to the successful *mediation* of knowledge content to learners. In our interpretation, the didactic recommendations of LCT should be understood in this light: as ways of promoting access to knowledge content.

As a resource for critical enquiry, LCT provides a framework for both qualitative and quantitative analysis of educational contexts “in a manner enabling systematic comparisons within and between these contexts ...” (Maton, 2007, p. 104). Such analysis may involve any of three active dimensions, termed *Specialization*, *Semantics* and *Autonomy*. Of these, *Semantics* (so far, the most developed of the five dimensions) in particular has had fruitful exchanges with Systemic-Functional Linguistics (SFL) (see, e.g., Maton and Doran, 2017a, 2017b), with mutual theoretical developments in both theories. Briefly told, *Semantics* can be used to identify relative strengths of technicality and abstraction in social practices, including educational discourse. Further, as a key to successful pedagogy, LCT *recommends* structuring educational discourse as a sequence of semantic ‘waves’, i.e. as cyclical variation between higher and lower degrees of technicality and abstraction.

Apart from such semantic ‘waving’, the educator may also, at some points, see a need to move out of a given curricular topic and introduce parallels from outside the curriculum (see Maton and Howard, 2018, 2020), e.g. to enable the students to make the connection between curricular elements and their own lived experience. Thus, in the context of, for example, a school lesson or teaching situation, a given topic may not be ‘autonomous’ and enjoy undivided focus but may co-occur with rivalling topics or practices. The degree of insulation or independence of a topic or practice within a given context is indeed what the LCT dimension of *Autonomy* is centrally about. In Maton and Howard’s own words,

Autonomy begins from the simple premise that any set of practices comprises constituents that are related together in particular ways. [...] Constituents may be actors, ideas, institutions, machine elements, body movements, etc.; [...]. Autonomy explores the issue of insulation or external boundaries. It asks: how insulated is a set of practices from other practices? (Maton and Howard 2020, p. 96).

We find, however, that the theoretical definition is abstract to a degree where elaboration of the concept would be useful. As one of the more recently developed aspects of LCT, the Autonomy dimension has received relatively

limited attention so far, which is why the present article therefore aims to expand the dialogue between LCT and SFL in order to facilitate further operationalization of the concept, i.e. to elaborate/interpret the theory with the purpose of enhancing its operationality for analytical purposes.¹ It should be emphasized, however, that while LCT is a sociological theory, our focus here is with *linguistic* practices. Accordingly, the operationalization that we propose is limited in scope, and relevant only for communication by means of language. Specifically, we will interpret the dimension of Autonomy through the lens of the SFL concept of *communicative context*. Section 2, therefore, introduces the relevant aspects of SFL and LCT, and Section 3 exemplifies the operationality of the Autonomy dimension (as interpreted through SFL concepts) in two case studies.

2 Theoretical framework

This section charts the theoretical parallels between the SFL concept of *context* and LCT's concept of *Autonomy*. Subsection 2.1 briefly covers certain preliminaries regarding *context* as a stratum in the SFL model of language, Subsection 2.2 defines the relevant aspects of the three components of context: *Field*, *Tenor* and *Mode*, and Subsection 2.3 interprets the *Autonomy dimension*.

2.1 Context in the SFL stratified model of language

Originating in anthropological research (cf. Malinowski, 1935), SFL has always stressed *use in context* as key to understanding the structure and function(s) of language. In informal terms, the use of language is centrally concerned with the exchange of worded meanings within some kind of social context. With this central observation, language is therefore conceptualized as a stratified semiotic system whose 'architecture' consists of the strata *semantics* (meanings), *lexicogrammar* (wordings) and *phonology/graphology* (language sounds and letters). The link between the strata is *expression* or *realization*: Meanings are realized in wordings which, in their turn, are expressed by means of language sounds/letters. Conversely, combinations of sounds/letters express words, and combinations of wordings express meanings (e.g., Halliday, 2003).

Further, communication by means of language is always *embedded* in some kind of social context that impinges on the selection of worded meanings. In SFL, therefore, social context is recognized as a distinct semiotic stratum that should be understood as "relevant context" in a communicative event. Context is therefore seen as "that part of the extralinguistic situation which is *illuminated* [emphasis added] by language-in-use, by the language component of the speech event" (Hasan, 1995, p. 219). In other words, context is *reflected* in (cf. Hasan, 2009, p. 177), or indexed by, the choice of worded meanings exchanged. The nature of this indexical relation between context and semantics is two-fold: On the one hand, it means that context *determines* what meanings are exchanged, and conversely those meanings in themselves signal the kind of extra-linguistic circumstances surrounding the communication.

2.2 Contextual variables in SFL: Field, Tenor and Mode

The contextual variables that are held to leave an imprint on the use of language in communicative situations are, informally glossed, 1) the 'aboutness' or content of the exchange, 2) the relationship between the communicating partners, and 3) the role assigned to the language in the situation. The SFL terms for these three perspectives on language are *Field*, *Tenor* and *Mode*, respectively, to be detailed below.

2.2.1 Field

In an oft-quoted definition of the three contextual variables, the *Field of Discourse* refers to "what is happening, to 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, 1989, p. 12). Social activity, in other words, is the central component here. The activity may be a joint, physical, language-external one (such as building a house, unloading items from a vehicle, assembling an IKEA cupboard, preparing a meal, etc.), or the activity may consist in 'linguaging' only, as in two friends swapping stories and gossip, independently of any accompanying physical activity.

¹ It may need to be pointed out that our operationalization is aimed at qualitative research.

A second element of Field is ‘subject matter’ or what the communication is ‘about’ (e.g., Halliday, 1978, p. 143). In more recent publications (Matthiessen et al., 2008, p. 202, Matthiessen et al., 2010, pp. 95-96, Halliday and Matthiessen, 2014, pp. 33-36), ‘subject matter’ is termed *semantic domain*, and ‘social activity’ is termed *socio-semiotic process*, which will be the two preferred terms henceforth. While *semantic domain* can be deemed a self-explanatory concept, *socio-semiotic process* (SSP) will be elaborated in the following.

As already mentioned, certain types of SSP are exclusively semiotic, consisting in the linguistic exchange only, whereas in others the ‘linguaging’ accompanies some non-verbal, practical/physical activity. In the case of wholly semiotic SSPs, the exchange of meanings constitutes the entirety of the ‘action taking place’ (as in the case of most written texts). When the ‘linguaging’ co-occurs with non-linguistic elements, the language use is ‘ancillary’ (Hasan, 1989, p. 57), serving to facilitate the joint, external, physical operations (e.g., Matthiessen 2015: 6). The difference may be illustrated with the example of a football match:² During the match, the actual physical activity of kicking a ball around between players on the football field constitutes the most important part of the activity, while the ‘linguaging’ occurring between the players (the shouts and commands) is secondary, serving merely to facilitate the playing. When the match is over and the players return to the locker room, however, vivid discussion typically breaks out: Now the match is ‘reenacted’ by means of language only, in the players’ recounts, after-the-fact comments, questions and, possibly, recriminations. In this latter case, the situation is wholly semiotic, with the match only present as ‘subject matter’ in the discussions, i.e. as *semantic domain*.

In the paradigm of SSPs in Fig. 1 below, the distinction between wholly and partially semiotic processes appears as the first set of options (‘semiotic’ vs. ‘social: doing’):

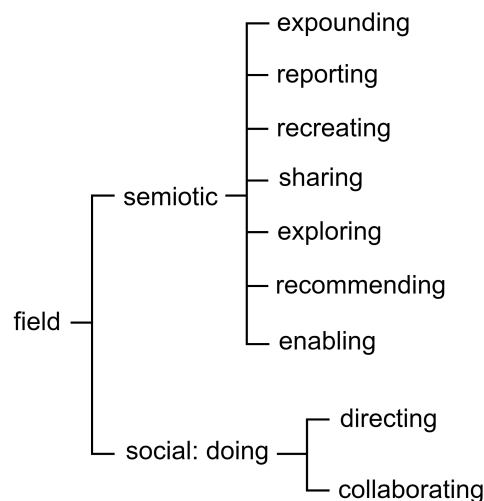


Fig. 1: A paradigm of socio-semiotic processes (adapted from Matthiessen et al. 2010: 96).

As Fig. 1 shows, when the social semiotic process is ‘social: doing’, the facilitation of the practical/physical operation in question takes place either through ‘directing’ (i.e. with one speaker issuing commands or instructions) or ‘collaborating’ (Matthiessen 2015, p. 6). Fig. 1 further illustrates that when the communicative situation is constituted by ‘linguaging’ only, seven different options open up:³

1. The category of *expounding* prototypically occurs in educational contexts, e.g. in lectures and textbooks in a range of academic disciplines. It consists in the exposition of knowledge about general classes of events and entities, either through explanation or categorization.
2. The *reporting* category, on the other hand, pertains to the relay of information about particular rather than general classes of phenomena. It is typically manifested in the chronicling of specific events, as in history books and news reports.

² The example is taken from Halliday (1978, p. 144).

³ The following account of the seven options is based on Matthiessen and Teruya (2016, pp. 207-208).

3. The **recreating** category mainly applies to fictitious meaning-making. It refers to the narration or dramatization of imagined rather than factual events, as in much prose literature or drama.
4. The **sharing** category is clearly interpersonal in orientation: It refers to the exchange of personal experiences and values with the purpose of building or maintaining relationships, as occurs in much informal chat among friends and peers.
5. **Exploring** is centrally concerned with the expression of attitudes in public fora. More specifically, it consists in “exploring public values (opinions) and positions (ideas, hypotheses)”, as in political debates.

The two final categories of SSPs are semiotic processes that potentially lead to a ‘doing’ context, i.e. to practical action:

6. The **recommending** category consists in either advising or promoting, depending on whether the meaning-making is undertaken for the benefit of the addressees or for the speaker. Advising addressees to undertake a certain course of action (as in ‘agony’ columns in lifestyle magazines) is done for their benefit, unlike promotion of, e.g., a product or a service (as in TV or Internet commercials), which is done for the speaker’s sake.
7. Finally, the category of **enabling** prepares addressees for future ‘doing’ (language-external activity) either through instructing them in some type of procedure (as in user manuals), or through regulating their actions, as in legal contracts and statutes.

2.2.2 *Tenor*

Tenor is traditionally defined as the way that social roles and statuses impinge on the discourse. Various aspects of role relationships have been highlighted over the decades in SFL literature, such as the degree of familiarity between the communicants, equality vs. inequality in hierarchical status, and the degree of affect brought by interlocutors to the exchange (see, e.g., Hasan, 1989, pp. 56-57, Halliday and Matthiessen 2014: 33). For present purposes, however, only one particular aspect is relevant, namely the question of *agent roles* recognized in the social system (Hasan, 1989, p. 56), i.e. dyads such as teacher-student, doctor-patient, policeman-suspect, vendor-customer, attorney-client, parent-child, friend-friend etc.

2.2.3 *Mode*

Mode concerns the role of language in the situation (Halliday, 1989, p. 12, Halliday and Matthiessen, 2014, p. 33). Two aspects relevant to the present purpose are *division of labour* and *rhetorical mode* (Matthiessen et al., 2010, p. 144). *Division of labour* pertains to the extent to which language interacts with other semiotic systems or physical/practical processes in the enactment of the communicative event. It is in cases where such interaction is present that the role of language tends to be ‘ancillary’ (see Subsection 2.2.1), i.e. serves to enable the performance of a practical, non-linguistic process. In this case, the meanings being made will be closely tied to the ‘here-and-now’ of the exchange (cf. Halliday and Hasan 1976, p. 34). In cases where no such interaction takes place and where the ‘linguaging’ is solitary in enacting the event (as in most written texts), the role is ‘constitutive’ (Hasan, 1989, p. 57),⁴ with the language carrying sole responsibility for the meaning-making.

Rhetorical mode is equivalent to what is termed pragmatic function or purpose in other linguistic theories. The rhetorical mode of a text/dialogue may be oriented to the subject matter (e.g., informative, didactic, expository, analytical etc.) or be interpersonal in orientation (hortatory, persuasive, commissive, evaluative etc.) (see also Halliday and Matthiessen, 2014, p. 34).

2.2.4 *Divergence between SFL ‘schools’ in the interpretation of context*

Among the different ‘schools’ of systemic-functional theory, there is general consensus about the overall layout of the stratified model of language (*semantics – lexicogrammar – phonology/graphology*), but when it comes to

⁴ It may be obvious that the ancillary-constitutive distinction closely corresponds to the division between ‘social: doing’ and ‘semiotic’ SSPs, and Hasan (1999) indeed argues that the distinction is inherent in Field. The debate, however, will not be pursued here, and the ‘classic’ definition of *Mode* (as in Halliday and Matthiessen, 2014) maintained instead.

the stratum of *context*, understandings diverge. The 'Sydney school' branch of SFL (e.g., Martin, 1992, 1999, 2001, and Martin and Rose, 2007, 2008) interpret context as internally stratified, with *genre* as a semiotic level above *Field-Tenor-Mode*. While useful in a pedagogic teaching sense, this view of context has proven the main point of contention between the Sydney school and those adhering to the original Hallidayan interpretation, in which context is viewed as a unified level with no sub-stratification (Halliday 1989, Halliday and Matthiessen, 2014, Hassan, 1999, 2009). The central question is whether or not one particular aspect of context can be assigned primacy as the ultimate determinant behind the configuration of *Field*, *Tenor* and *Mode* settings. Such a determinant would be a text's overall *telos*, identified by Martin (e.g., 1992, p. 503) with the concept of *genre*. Taking up this discussion, however, is far beyond the scope of the present article. Although it is the Sydney school version of SFL in particular that has interacted with LCT, in this case we nevertheless find the 'classic' Hallidayan approach better suited to elucidating the concept of *Autonomy*. The relevant categories – especially those pertaining to *Field* in Matthiessen's theorization of *context* (e.g., 2015, Matthiessen and Teruya, 2016) – are more fine-grained and well-suited for our purposes here.

2.3 The LCT concepts of Positional and Relational Autonomy

The concept of *Autonomy* is defined by Maton and Howard (2020) as follows (also quoted in the introductory section):

Autonomy begins from the simple premise that any set of practices comprises constituents that are related together in particular ways. [...] Constituents may be actors, ideas, institutions, machine elements, body movements, etc.; [...]. Autonomy explores the issue of insulation or external boundaries. It asks: how insulated is a set of practices from other practices? (p. 96).

The question of insulation has two aspects, namely *Positional Autonomy* and *Relational Autonomy*, respectively. *Positional Autonomy* (PA) is the question of 'how insulated are the constituents [of the practice in question]', and *Relational Autonomy* asks 'how insulated are the ways those constituents are related together' (Maton and Howard 2020, p. 96). In line with other dimensions of LCT, both aspects are scalar, extending along continua from 'weaker' to 'stronger'. Stronger positional autonomy (PA+) means that the constituents of a practice or context are distinct from those of a different context, whereas weaker positional autonomy (PA-) indicates some degree of blending between constituents from different practices. Stronger relational autonomy (RA+) implies uniformity in the way constituents are related together, whereas weaker relational autonomy (RA-) indicates heterogeneity in this regard. In the latter case (RA-) constituents are related in ways associated with diverse practices or contexts (Maton and Howard 2020, pp. 96-97). In relation to *texts*⁵, the concept of positional autonomy can be interpreted as being centrally concerned with the uniformity/heterogeneity of the text's semantic domain, i.e. whether only one domain is in focus (in which case it would exhibit stronger positional autonomy, PA+) or multiple ones are included (where the text exhibits weaker positional autonomy, PA-) in the text.

Relational autonomy (RA) resonates with the SFL concept of socio-semiotic process (SSP) as the most relevant SFL contextual (sub)dimension. This reading is supported by Maton and Howard's (2018, p. 97) paraphrase of 'stronger RA' as the situation where "the purposes, aims, ways of working, etc. are autonomous: they look inwards to that set of practices – they have their own way of doing things". In relation to texts, 'ways of working' / 'doing things' can be seen as synonymous with socio-semiotic process, in which the element of purposefulness or goal-orientedness is inherent (see Hasan, 1999). In certain cases, however, as the examples in Section 3 will show, the question of uniformity/heterogeneity regarding the way 'things are done' in a speech event may in some cases be further illuminated by taking *Tenor* (*agent roles*) and *Mode* (*division of labour* and *rhetorical mode*) into account. For the mapping of developments in PA and RA values in the unfolding of a text (or any other instantiated social practice), Howard and Maton (2018, 2020) propose the model below (Fig. 3). Known as the *Autonomy plane*, it represents the semiotic 'terrain' or 'topography' that emerges when the two continua, positional autonomy and relational autonomy, are intersected with each other. The resulting four quadrants each identify a so-called *autonomy code*, i.e. a particular combination of PA and RA values:

⁵ In accordance with SFL, a *text* is here understood as any kind of meaning-making event involving language, oral or written (see e.g. Halliday and Hasan, 1976, Hasan 1995, 1989).

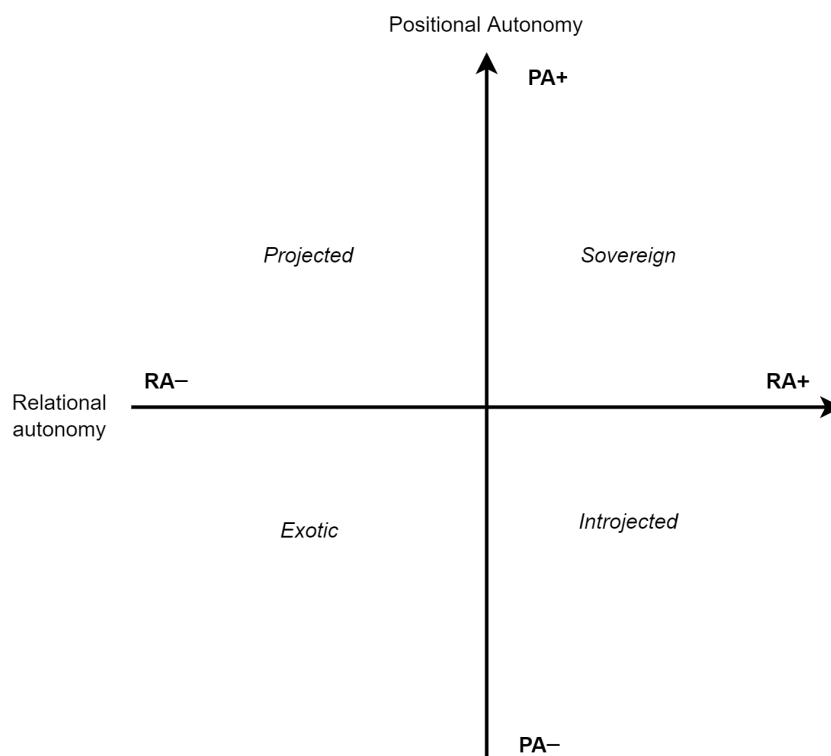


Fig. 2: The Autonomy plane (from Maton and Howard, 2018, p. 6).

As Fig. 2 indicates, the characteristics of the four different types of Autonomy codes are the following:
Sovereign codes (PA+, RA+) are realized by those parts of a text that are dominated by its central semantic domain and central SSP (with associated Tenor and Mode aspects);
Projected codes (PA+, RA-): central domain, but peripheral SSP(s) (and relevant Tenor and Mode aspects);
Introjected codes (PA-, RA+): peripheral domain(s), but central SSP;
Exotic codes (PA-, RA-): peripheral domain and SSP both.

Our understanding of these related concepts will become clearer in the examples provided in Section 3. By examining two different instances of discourse from the perspective of semantic domain and socio-semiotic process (and, where relevant, *agent roles*, *division of labour* and *rhetorical mode*), we can identify potential movements or '*pathways*' (Maton and Howard, 2018) between these different types of code in the unfolding of a text. Charting such '*pathways*' provides insights into how a text unfolds to support the social purpose.

3 Exemplification

For exemplification, two instances of discourse have been selected that are both to some extent educational⁶ in purpose:

- Subsection 3.1 investigates a five-minute long dialogue from an excerpt of a TV food programme.⁷ In this particular excerpt, the host, a Danish celebrity confectioner named Mette Blomsterberg, demonstrates how to bake

⁶ It may be noted that the two examples are not educational in the institutional sense. They are, however, clearly didactic in so far as they both aim to teach listeners something new.

⁷ An English translation (by the Authors) of a transcript of the Danish-language dialogue is found in Appendix A.

cinnamon rolls. Blomsterberg's two daughters, Maja and Laura (aged around 8-10), participate in the baking process, receiving and following instructions, which is reflected in the dialogue.

- Subsection 3.2 analyses a TED talk by a neuroscientist offering advice on how to stay calm at times of stress and confusion.⁸

3.1 *The TV food programme*

Since the excerpt belongs to the institutionalized genre of the 'TV food programme', it is no surprise that the semantic domain turns out to be the highly unified one of 'baking' throughout the programme. The domain-specific (though non-specialized) terminology of baking permeates the excerpt, in the reference to baking ingredients (*sugar, yeast, cinnamon* etc.), cooking utensils and kitchen appliances (*stove, oven* etc.), and to the constituent (physical) processes of baking such as adding ingredients, kneading the dough, leaving the dough to rise, brushing the rolls with whipped egg, etc. Altogether, this primary focus on the baking process positions the text high on the positional autonomy continuum (exceptions will be commented on later).

Regarding Tenor, on the other hand, the programme is in fact divided between several different agent-role dyads. Given the genre of the programme, the TV host assumes the role of 'cooking expert-and-instructor' addressing the viewers as 'instructees' or 'amateur bakers'. This set of roles is paralleled by another, though more peripheral dyad, arising from the fact that the host continually addresses her daughters, who participate in the programme and who perform much of the actual baking process (most of the time silently) under their mother's supervision and instruction. This other dyad, then, is 'parent-as-instructor/supervisor' addressing children in the dual role of 'doers' and learners.

The divided Tenor largely mirrors a split in the *division of labour* (Mode) and socio-semiotic process (Field). In *division of labour*, the language oscillates between the 'ancillary' and the 'constitutive' mode (see Subsection 2.2.3), i.e. between utterances supporting the practical, concurrent activity of baking the cinnamon rolls, which takes up the visual side of the programme, and (more) de-contextualized reflections uttered by the host on the topic of baking. These are more general remarks that make sense in themselves without reference to the specific physical activity taking place in the 'here-and-now' of the speech event. This oscillation back and forth between 'ancillary' and 'constitutive' language use runs in tandem with repeated alternation between two distinct SSPs: 'doing: directing' and 'enabling: instructing', with the latter occasionally shading into 'expounding'.

Those passages of the text that are dominated by the SSP of 'doing: directing' occur almost exclusively where the language (the host's only) serves to support the physical processes occurring alongside the 'linguaging' (and where Blomsterberg assumes the 'parent-as-supervisor' persona), such as finding ingredients, mixing them in a food mixer, etc., as in Example 1 below. In terms of interpersonal semantics, this SSP is consistently realized in what Matthiessen et al. (2008, p. 192) term *facilitative commands*, grammatically realized in modulated clauses (*you may ...*, *we need to ...*, *Will you ...*, and *it should be ...*):

Example 1

[2] *Mette*: [Looking at the girls] And Laura, you may, uh, split that vanilla bean and then, uh, scrape out the grains and then mash them really well in the sugar there so they get mixed [with the sugar]. [3] *Maja*, we need to get some milk warmed up. [4] Will you come over here and toss it on the stove? [5] [*Mette pours some milk into a saucepan*] There ... and it should be set to ... four.

Occasionally, however, even in connection with these 'exchanges' of 'goods-and-services' (cf. Halliday and Matthiessen, 2014, p. 136), the SSP shades into 'doing: collaborating', as evidenced in Example 2, which is 'consultative' rather than outright 'directive' in rhetorical mode:

Example 2

[*Laura pours a small amount of sugar into the bowl*]
Laura: [13] Like that?
Mette: [14] Yes.
[*Maja holds up a small bowl with salt in it.*]

⁸ A transcript of the talk is found in Appendix B.

Maja: [15] Salt?
Mette: [16] Yes.

Multimodally, shifts between the different types of SSP and Tenor are also indexed by the host's visual focus. When she is looking at the two daughters or looking at the kitchen table with the appliances, utensils etc. together with the girls, the SSP is in most cases 'doing: directing'. When she is looking into the camera, this invariably signals a change of addressee to the TV audience and (mostly) a shift into the 'enabling: instructing' SSP, as in Example 3:

Example 3

Mette: [*Looking into the camera*] [44.1] Now we're simply leaving the dough to be kneaded, allowing it to ... [45] no, not higher than level 2, Maja ... until the kneading is finished, [44.2] so that it becomes elastic and smooth. [46] It is very important when you make yeast doughs like this that they do not become, uh, dry. [47] They simply must not. [48.1] It should be a smooth, soft, delicious dough, [48.2] because in that way the pastry also ends up being springy and delicious and moist to eat. [...]

While briefly interrupted by the 'doing: directing' SSP in [45], with one of the daughters as the addressee, the SSP in Example 3 is predominantly 'enabling: instructing', serving to verbally educate the viewer in the art of making yeast doughs. Semantically, the educational character of [46–48.1] is especially manifest in the timelessness of the clauses, with the present tense of the VPs (*is, make, do not become, etc.*) denoting recurrent or generic actions rather than specific actions located in time, and with the nominal groups⁹ carrying generic reference. Semantically, clauses [46–48.1] are thus generalizations – a typical feature of educational texts.

Occasionally, the educational passages addressed at the TV viewers shade into 'expounding' as seen in the following example:

Example 4

Mette: [*Producing a saucepan and pouring ingredients into it*] [87] Now I need to make the icing for the rolls. [88] Icing sugar and water. [*Stirring the contents of the saucepan on the stove*] [89.1] I've actually turned on the hotplate here a little, [89.2] so that I can heat it a bit. [90] Not that it should get hot, but just warm. [91] In that way it becomes a little more fluid, uh, without becoming too liquid, [92] and then it actually solidifies faster when it's been spread on the slightly cooled rolls. [...]

The descriptions in Example 4 are paradigmatic ones, despite being temporally located in the 'now' of the speech event rather than being semantically timeless, and despite the fact that they serve as comments on the concurrent, practical activity of the host (and on developments in the immediate future in [91] and [92]). This paradigmatic nature of the comments highlights their explanatory and educational purpose. In clauses [89.2] and [91–92] the specific type of SSP may be interpreted as 'enabling: instructing' shading into 'expounding', given that these clauses still serve to instruct the viewers in this part of the baking process. However, clauses [91–92] also feature a (non-scientific) exposition or explanation of a sequence of 'events' that are not really the baker's 'doings', but steps in a non-human physical (thermodynamic?) process, i.e. 'temperature elevation in icing' → 'increased fluidity' → 'faster solidification'.

While the 'doing: directing' and 'enabling: instructing' SSPs are clearly the predominant ones in the text, a third is also discernible, albeit less apparent and to a greater degree open to interpretation. This third strand in the text would be 'sharing', realized in the recurrent praise (or 'positive appreciation', in Martin and White's (2005, p. 56) terms) uttered by Blomsterberg whenever the daughters have satisfactorily completed some particular phase of the baking project:

Example 5

[*Food mixer is churning during this part of the dialogue.*]

⁹ The Danish grammatical Subject that is here translated as 'you' is the generic *man* (same as in German), meaning 'anyone'.

Mette: [35.1] Laura, just give it another big spoonful of flour or two, in fact, [35.2] and then Maja will add the butter. [36.1] It's on purpose that I don't, uh, add the butter together with the yeast, right, [36.2] because then it can't really breathe and work. [37] The whole lot goes in, Maja. [...] [38] **Really good.** [39] **Yes, like that.** [40] **That's the way to do it.** [41] Mind your paws. [42] And then you start it nice and easy [*emphases added*].

As Example 5 illustrates, the positive appreciation in [38]–[41] (*Really good, Yes, like that, That's the way to do it*) is embedded within the 'doing: directing' SSP, and may of course be simply interpreted as being part of the speaker's verbal efforts to facilitate the baking process. Yet, the frequency of these appreciative semantic units (realized at different lexicogrammatical ranks) is conspicuous, bordering on overlexicalization. Therefore, a possible interpretation of these elements is to view them as a third type of context whose semantic domain would be 'parenting', and whose purpose appears to be that of dramatizing a harmonious and collaborative parent-child relationship in accordance with modern Scandinavian parenting values. Other elements in the multi-modal signification as a whole supporting this interpretation is Blomsterberg's positive appreciation of the *product* of the collaborative effort, i.e. the cakes in themselves (clauses 81, 101.3 and 108), the sing-song chant which she and the girls engage in together (occurring between clauses [72] and [73], and mentioned but not otherwise reflected in the transcript), and the fact that at the end of the episode, immediately after the tasting of the cakes, mother and daughters huddle together, smiling directly into the camera (not reflected in the transcript either).

If the above interpretation is sound, i.e. if three different SSPs are detectable in the excerpt, these represent different degrees of centrality/peripherality, i.e. different degrees of relational autonomy, in relation to the central objective of the programme, which is that of teaching TV viewers how to bake cinnamon rolls.¹⁰ This means that although the physical activity of baking the cinnamon rolls dominates the visual side of the broadcast, in terms of verbal signification the 'enabling: instructing' SSP with its concomitant Tenor (baking expert addressing amateur bakers) is central, corresponding to stronger relational autonomy (RA+). The 'doing: directing' SSP with its attendant Tenor (parent as instructor addressing child as doer and learner), on the other hand, must be seen as subservient to the former and thus more peripheral and therefore exhibiting a weaker relational autonomy (RA-). Both of these SSPs, however, combine with the central semantic domain of 'baking', consistent with stronger positional autonomy (PA+), locating them in each of the two top quadrants of the Autonomy plane, i.e. the 'sovereign' and the 'projected' code, respectively (see Fig. 3 below). The third strand of the text (the enactment of the harmonious parent-child relationship) is the most peripheral of the three SSPs, and since its relation to the semantic domain of 'baking' is marginal (PA-), it belongs to the 'exotic' code:

¹⁰ What is disregarded here is the obvious fact that most TV productions these days, including documentary and educational programmes, are made for entertainment first and foremost. This overriding purpose of the programme as a whole is something that the analysis is forced to ignore.

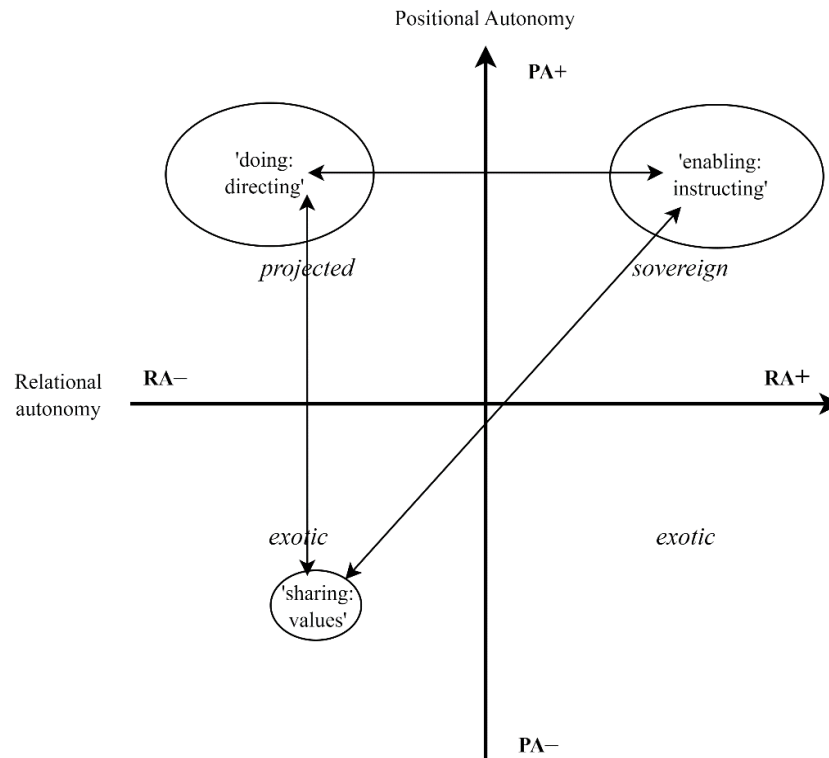


Fig. 3. Autonomy codes in the ‘baking’ excerpt. The different sizing of the three elliptical circles indicates relative predominance of the codes in the excerpt.

It should be noted that Fig. 3 does not diagram a single, one-directional Autonomy ‘journey’, which is why the three arrows are pointed at both ends, symbolizing the oscillation between all three codes throughout the text.

3.2 The TED talk

Unlike the TV food programme analyzed in Subsection 3.1, the TED talk *How to stay calm ...* does feature a largely one-directional Autonomy ‘journey’, and, moreover, one that to some extent resembles the type of ‘tour’ in Maton and Howard (2018, pp. 18-21) that appears to be highlighted as a paradigmatic example of ‘good teaching practice’. In Maton and Howard’s (2018) example, the teacher in question succeeds in integrating central and more peripheral semantic domains and socio-semiotic processes in such a way that the more peripheral sections support the central ones. The same type of successful integration is evidenced in the TED talk, which revolves around three primary socio-semiotic processes, each accompanied by a certain semantic domain (in one case, though, a cluster of related domains). The most central SSP is ‘recommending: advising’ and two more peripheral ones are ‘expounding’ and ‘reporting’. The ‘recommending’ and ‘expounding’ sections clearly feature a ‘neuroscientist-to-lay audience’ Tenor, whereas the ‘reporting’ sections are less clearly marked by the ‘scientist’ persona of the two others, making this one the most peripheral of the three.

Structurally, the talk takes its point of departure in the most peripheral of the three SSPs, which is the ‘reporting’ of a relatively mundane series of events centred around the presenter himself (sections 1-6¹¹). The concomitant semantic domain is similarly peripheral, pertaining to the universal human experience of forgetfulness and its attendant problems:

Example 6

[1] A few years ago, I broke into my own house. [... A]s I stood on the front porch fumbling in my pockets, I found I didn't have my keys. [...] I found a large rock and I broke through the basement window [...]. I found a piece of cardboard and taped it up over the opening, figuring that in the morning [...] I

¹¹ The numbering inside the examples refers to the numbering of paragraphs in Appendix B.

could call my contractor and ask him to fix it.

Only briefly interrupted by a more central SSP and domain (to be detailed below) in section 3 (RA+ and PA+), the first six sections are thus located in the ‘exotic’ code in the Autonomy plane. The semantic domain of the story line, however, evolves into the central topic of the talk (PA+), which the presenter introduces as the *pre-mortem* principle, or *prospective hindsight*. The two synonymous terms refer to the need to anticipate potentially adverse events at moments of stress when our thinking is clouded. The first seven sections thus form the following ‘pathway’ on the Autonomy plane:

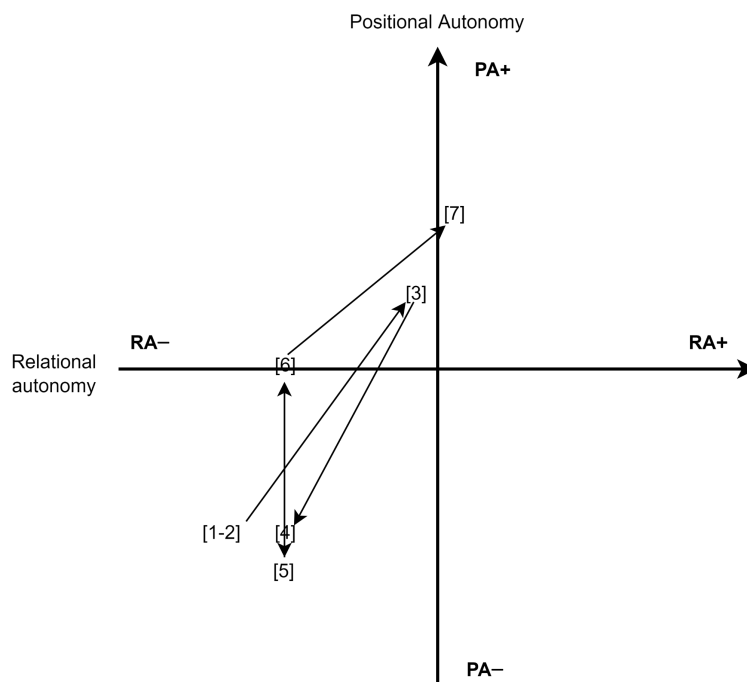


Fig. 4: Autonomy code developments, sections 1-7 in the TED talk.

In elaborating the *pre-mortem* principle from section 10,¹² the SSP changes into ‘expounding’, and the Tenor more clearly becomes that of ‘neuroscientific expert addressing a lay audience’ (RA+). This particular combination of SSP and Tenor makes for a clearly didactic rhetorical mode when the presenter introduces various neuroscientific concepts needed to understand this principle:

Example 7

[10] ... there's a lot of science to back this up, based on the way our spatial memory works. There's a structure in the brain called the hippocampus, that evolved over tens of thousands of years, to keep track of the locations of important things -- where the well is, where fish can be found, that stand of fruit trees, where the friendly and enemy tribes live. The hippocampus is the part of the brain that in London taxicab drivers becomes enlarged. It's the part of the brain that allows squirrels to find their nuts.

In Example 7, the speaker expounds the concept of *the hippocampus* by categorizing it meronymically (as part of the brain) and by characterizing its function (the fact that it functions as spatial memory). The didactic character of the example manifests itself in ‘translation’ of the specialized, and semantically dense, cerebro-anatomical term *hippocampus* into non-specialized meanings much closer to concrete, human experience, including *fish*, *fruit trees* and *London taxicab drivers*.

In connection with the *pre-mortem* principle as a central semantic domain in the text, the presenter largely sticks to the SSP of ‘expounding’ in combination with the didactic rhetorical mode. After section 10, however, he in

¹² Sections 8-9 will be commented on below.

fact takes ‘pathways’ through increasingly peripheral topics, albeit all still somehow connected with the main topic. Thus, while early in the talk (section 6) a relation is established between stress and the importance of the *pre-mortem* principle (since it is at moments of stress that observing the principle becomes paramount), the topic of stressful moments is exemplified with situations where “you are confronted with a medical decision to make” (section 14). This is a more peripheral semantic domain, corresponding to weakened positional autonomy (PA–). The presenter continues his talk by exemplifying these stressful moments with the specific choice facing patients diagnosed with elevated cholesterol (section 16). The choice is whether or not to start taking cholesterol-lowering drugs known as *statins*, which are associated with a number of unpleasant side effects. This dilemma, in its turn, leads on to the medical concept of NNT, *the number needed to treat* (section 17), i.e. a drug’s ratio of efficacy (the percentage of a patient cohort actually benefiting from the drug, which is often quite low, it turns out). The concept of NNT, then, is exemplified with prostate-cancer surgery (whose efficacy is at an alarming 2% only) (section [20]). As a consequence of this development in semantic domain, there is a concomitant development in Tenor, with the speaker’s persona moving away from the central one of ‘neuroscientist’ and into the more peripheral one of ‘medical expert’. Accordingly, the relational autonomy is weakened (RA–). Thus, between sections [10] and [20] (with sections 11-13 and 19 omitted and to be commented on below), the Autonomy ‘pathways’ take the following shape (Fig. 5):

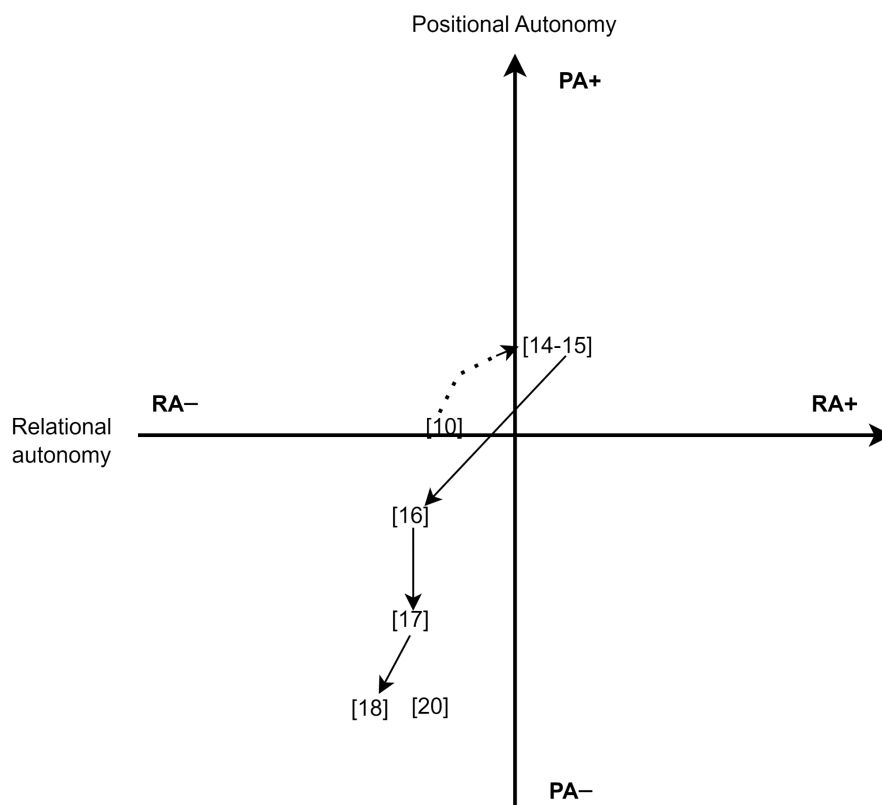


Fig. 5: Autonomy ‘pathways’, sections 10-20 in the TED talk.

Starting from sections [8-9] and appearing in between the instances of the ‘expounding’ SSP, the most central SSP occurs, which is that of ‘recommending: advising’ (sections 8-9, 11, 12, (partly 13 and 19), 21, 23). The Tenor in these passages is still ‘expert-to-lay’, since the presenter is offering his advice as a neuroscientist, but there is an ‘advisory’ component to the Tenor also, reminiscent of a ‘lifestyle coach’ persona. The semantic domain in all these cases is the most central one of *pre-mortem principle*, or practical applications of it, situating these passages in the ‘sovereign’ code. Examples are:

Examples 9-10

[11] [05:00] So in the home, designate a spot for your keys -- a hook by the door, maybe a decorative

bowl. [...] If you designate a spot and you're scrupulous about it, your things will always be there when you look for them.

[21] [10:27] These [difficult medical decisions] are things to talk about and think about now, with your family and your loved ones. You might change your mind in the heat of the moment, but at least you're practiced with this kind of thinking.

Between sections [8] and [21], the full Autonomy 'journey' is the following (Fig. 6), illustrating the speaker's zig-zag course between 'sovereign' and 'exotic' codes:

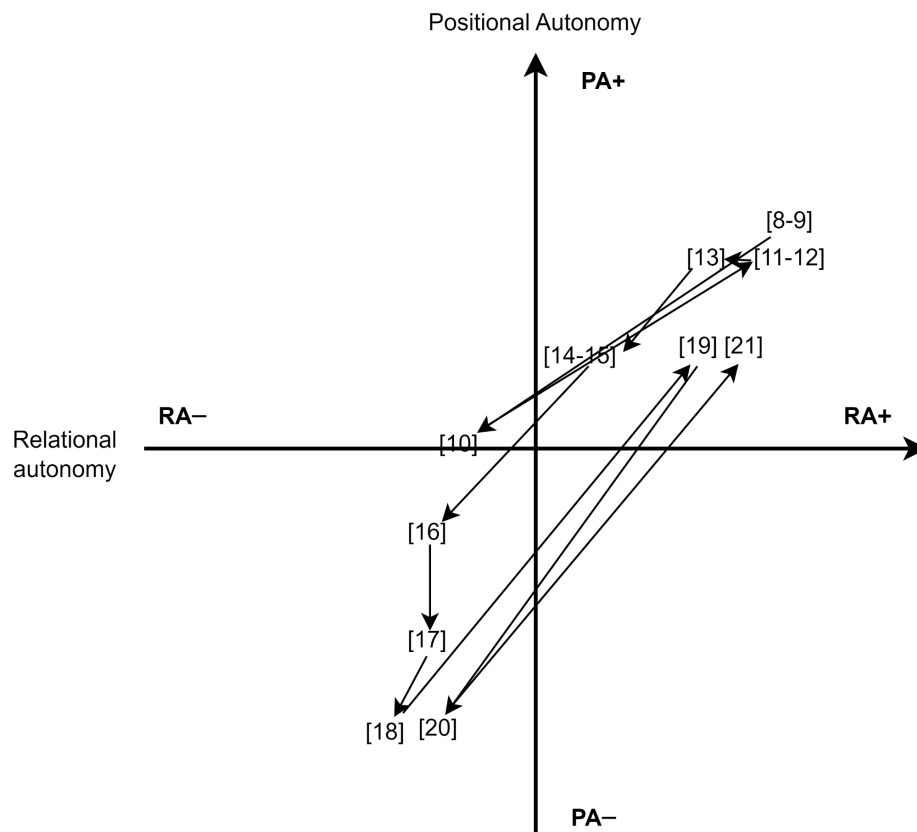


Fig. 6: The full 'journey' between sections 8 and 21.

In section [22], the 'journey' returns to the topic of 'stress' as such (related to, and therefore only slightly more peripheral (PA-) than, the *pre-mortem principle*), but the SSP once again turns into the more peripheral one of 'expounding' (RA-), in this case by stating the reason why a number of our physiological systems 'shut down' when we are under stress:

Example 8

[22] Remember, our brain under stress releases cortisol, and one of the things that happens at that moment is a whole bunch of systems shut down. There's an evolutionary reason for this. Face-to-face with a predator, you don't need your digestive system, or your libido, or your immune system, [...].

Example 8 constitutes an explanation by causally relating the suspension of physiological systems not essential for survival with two antecedent stages, viz. 'experience of stress' followed by 'release of cortisol'.

As previously mentioned, section [23] is one of those that are firmly situated in the 'sovereign' code, being an advisory section concerned with the *pre-mortem principle* (PA+, RA+). In the final section, however, the speaker returns to, and concludes, his story line from the opening of the talk, ending the talk in the 'exotic' code (RA-, RA-). A diagram of the full Autonomy 'tour' of the whole talk is thus the one depicted in Fig. 7 below:

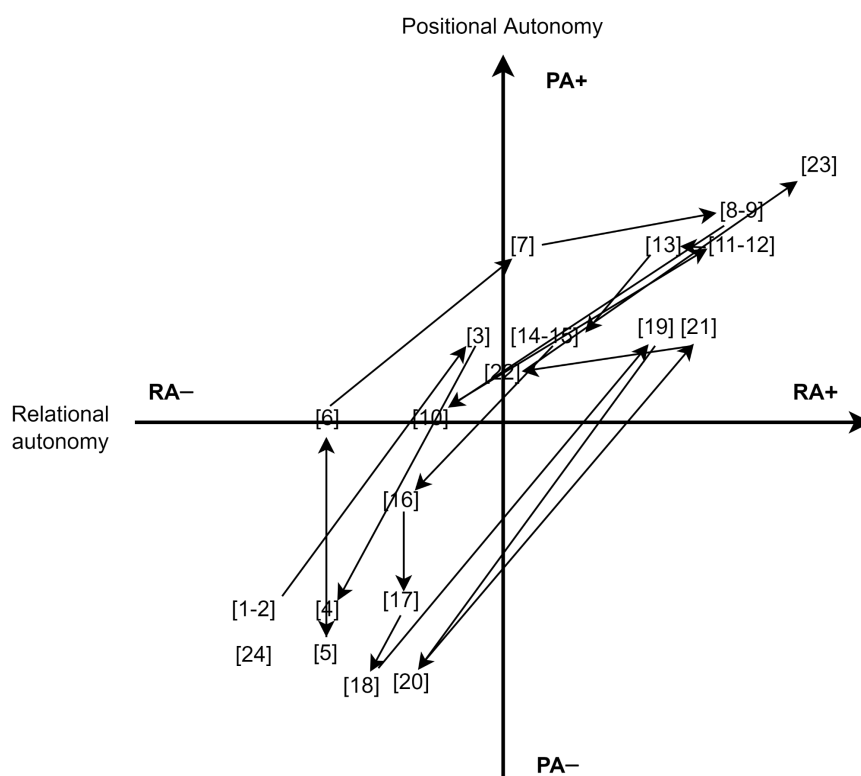


Fig. 7: The full Autonomy ‘journey’ in the TED talk.

In terms of beginnings and endings, the diagram illustrates the overall contours of the kind of ‘journey’ that is typical of TED talks: The talk takes its point of departure in a short tale of a personal experience, clearly intended as a ‘hook’ to catch the listeners’ interest, and it returns to that same point of departure at the end.

4 Concluding remarks

This article has proposed an operationalization of the Autonomy dimension from Legitimation Code Theory (but applicable to verbal discourse only). The operationalization was based on parallels found in the SFL (specifically Hallidayan) conceptualization of communicative context, and exemplification was provided in two different cases of knowledge communication. Both cases featured Autonomy ‘movements’, since the analyses revealed both texts to oscillate between central and more peripheral socio-semiotic processes and semantic domains.

While the operationalization provided here is primarily intended to support the Autonomy dimension as an analytical tool, it may also be used in support of the prescriptivism that is characteristic of LCT (see introductory section). As briefly noted in Subsection 3.2, this prescriptivism manifests itself in recommendations that when educators take Autonomy ‘journeys’, these should be ‘round trips’, meaning that the educator should make certain to integrate more peripheral socio-semiotic processes and semantic domains with the central ones of, e.g., a school lesson. In Maton and Hood (2018), e.g., one example that was clearly intended as a case of ‘model pedagogy’ consisted in the educator moving from a sovereign code into an exotic code and, via an introjected code, back to the sovereign code. By taking this ‘round trip’, the teacher succeeded in drawing explicit parallels between the students’ own lived experience (belonging in an exotic code) and the central curricular topic. Whether such a ‘round trip’ is recommendable obviously depends on the purpose of the text.

The operationalization of the Autonomy dimension proposed here is a tool that may support educators specifically and knowledge communicators more generally in making informed choices about whether to take ‘trips’ or not, and, if a ‘trip’ is embarked on, how. Similarly, the tool may, of course, support retrospective assessment of Autonomy movements. Thus, in the first of the two cases analysed in section 3, the TV host’s

relatively seamless movements back and forth between sovereign and projected codes could be seen to clearly support the overall purpose of the programme (that of instructing TV viewers in the baking of cinnamon rolls), whereas the occasional intrusion of an exotic code (the parent's overemphasis on encouraging her children) verges on a distraction. Similarly, in the TED talk, it is arguable that the presenter's constant oscillation between sovereign and exotic codes is on the point of endangering the coherence of the talk, especially considering the lengthy treatment given to certain medical topics in the exotic code. These, however, are only intimations of possible uses of our operationalization.

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Appendix A: TV food program

English translation:

(Danish original below)

Mette: [1.1] [*Looking into the camera*] Now we are simply going to get started on these cinnamon rolls, [1.2] which is a rather soft, delicious yeast dough.

[2] [*Looking at the girls*] And Laura, you may, uh, split that vanilla bean and then, uh, scrape out the grains and then mash them really well in the sugar there so they get mixed [with the sugar]. [3] Maja, we need to get some milk warmed up. [4] Will you come over here and throw it on the stove? [5] [*Mette pours some milk into a saucepan*] There... and it should be set to ... four.

[*Camera shows Maja putting a saucepan with the milk on the stove and setting the hotplate to level 4*].

Mette: [6] Good. [7] Super.

[*Camera focuses on a food mixer and bowl and shows one of the girls pouring eggs from a jug into the bowl.*]

Mette: [8] There. [9] The vanilla sugar, too. [10] Yup. [11] And then we need cinnamon and salt. [12] Laura, you take the sugar.

[*Laura pours a small amount of sugar into the bowl*]

Laura: [13] Like that?

Mette: [14] Yes.

[*Maja holds up a small bowl with salt in it.*]

Maja: [15] Salt?

Mette: [16] Yes.

[*Maja pours ginger and cardamom into the bowl.*]

Mette: [17] Ginger and cardamom. [18] Like that, Maja. [19] Yes. [20] Super good.

[*Camera shows Mette attaching a new bowl to the food mixer.*]

[20 α] Then I just add a little flour to the eggs and spices [20 β] so it won't get too hot. [21] Will you get a packet of yeast in the fridge?

Maja: [22] Yes.

[*Mette pours the warm milk into the food mixer bowl.*]

Mette: [23] Here. [24] Then the milk goes in. [25] You just have to wait a bit with the butter, Maja. [26] The yeast needs to go in first. [27] Just crumble it right in, OK?

Maja: [28] Without it getting all over the table.

Mette: [29] Mm.

[*Laura holds a packet of yeast over the food mixer bowl and starts squeezing it.*]

Mette: [30] Just crumble it.

Maja: [31] Now it's my turn.

Mette: [32] And then we need to get the bandit started first. [33 α] And you know [33 β] that you must never ever put your fingers in it, right?

[*Mette starts the food mixer.*]

Mette: [34] The butter goes in in just a moment. [...] [35.1] *Laura*, just give it another big spoonful of flour or two, in fact, [35.2] and then *Maja* will add the butter. [36.1] It's on purpose that I don't, uh, add the butter together with the yeast, right, [36.2] because then it can't really breathe and work. [37] The whole lot goes in, *Maja*. [...] [38] Really good. [39] Yes, like that. [40] That's the way to do it. [41] Mind your paws. [42] And then you start it nice and easy.

[*Maja starts the food mixer. The dough is kneaded in the mixer*]

Mette: [43] Like that.

Mette: [*Looking into the camera*] [44.1] Now we're simply leaving the dough to be kneaded, allowing it to ... [45] no, not higher than level 2, *Maja* ... until the kneading is finished, [44.2] so that it becomes elastic and smooth.

[46] It is very important when you make yeast doughs like this that they do not become, uh, dry. [47] They simply must not. [48.1] It must be a smooth, soft, delicious dough, [48.2] because in that way the pastry also ends up being elastic and delicious and moist to eat. [...]

Mette: [*Looking into the camera*] [49.1 α] Look, my experience is [49.1 β] that really, really many people make their yeast dough much, much too dry, [49.2] because they think it's a little too gooey to be messing around with. [50] It is the same thing when we make bread that we are just going to eat for breakfast. [...]

[51.1] I choose to make it quite soft and tender, [51.2] but that means that I've had to put a quite a lot of flour on the table, [51.3] because starting out with a lumpy dough that is so dry that you can't work with it, and rolling it out in additional flour, it really becomes too dry. [...] [52.1] Now it should just be left to rest for a while, [52.2] and meanwhile *Maja* will make a remonce. [...]

[*Camera follows Maja mixing ingredients in the food mixer.*]

[53] It is looking really good, *Maja*. [54] You see, it's getting a little airy now, right? [...]

Mette: [*Looking into the camera.*] [55] I'm just starting to feel the dough to find out if it has started to, uh, become stretchy. [56] When it's been lying on the table for a while, it'll soon start to give. [57] It is about ready to be rolled out.

Mette: [58] Super, *Maja*. [59] That's the way to do it.

Mette: [60] I'm just putting this one over here for a moment.

[*Mette starts rolling out the dough.*]

Mette: [61] [*Looking into the camera*] I try to make a rectangle like this, with clear corners. [62.1] It's important that it has sharp corners, [62.2] so I get to utilize all of the dough. [63.1] Of course, it is also a question of practice, [63.2] but that can be a small kind of challenge that you give yourself, to make it as rectangular as possible. [...] [64] Like that.

[*Camera shows the two daughters spreading the remonce on the rectangle of dough.*]

Mette: [*Looking into the camera*] [65] Now there's simply remonce all over here.

Mette: [*Looking down at the dough*] [66] Super. [67] Then I roll it into rolls here. [68] You throw those over there for washing. [69] The palettes.

Mette: [*Looking into the camera*] [70] Look, I'm simply rolling a, uh, 'roll sausage' here. [71] Make sure they are a little tight or the sausage is a little tight. [72] It is possible to tighten it up a bit along the way while I roll it. [*Camera shows 15 small, round baking tins placed on a baking tray. Mette sprays the tins with liquid grease. Mette and the daughters engage in a sing-song chant while cutting the rolled-up 'sausage' of dough into slices and placing these into the baking tins.*]

Mette: [73] Like that. [74] *Laura*, will you put them on [the tray] then?

[*Looking into the camera*] [75.1] Look, now, uh, the rolls actually just have to be left to rise, [75.2] and they actually do really well in that way, depending on the room temperature, for an hour, [75.3] so that they become

airy and delicious. [76] We have chosen to put them in these tins, in fact, uh, both to preserve the shape, [77.1 α] uh, it's pretty delicious [77.1 β] that they're kept together when they go in the oven, [77.2] that they do not just grow beyond recognition, uh, [77.3 α] and then it's also really delicious, I think, [77.3 β] that, uh, the remonce stays inside the roll and does not just disappear onto the baking tray. [78] So now they just have to be left in a warm place for an hour before going into the oven.

[*Camera shows the daughters brushing the rolls with egg.*]

[79.1] Now the brushing is in full swing here, [79.2] and it is simply just egg yolk and a little water and a little sugar that the girls are brushing [the rolls] with. [80] It's just to give the rolls a kind of shiny surface. [81] That's really nice.

[*Mette takes the baking tray with the rolls and moves to the oven.*]

Mette: [*Looking into the camera*] [82] Then I put them in the oven. [83] I bake them at a little more than 200 degrees so that they are actually baked pretty quickly on the outside. [84] Uh, when it's yeast dough, it still has to be soft inside.

[*Mette puts the tray in the oven.*]

[*Takes the tray out.*]

Mette: [85] Like this. [*Looking into the camera.*] [86] Now we just leave them here on the kitchen table to cool a bit until we make the icing and put it on.

Mette: [*Producing a saucepan and pouring ingredients into it*] [87] Now I need to make the icing for the rolls. [88] Icing sugar and water. [*Stirring the contents of the saucepan on the stove*] [89.1] I've actually turned on the hotplate here a little, [89.2] so that I may heat it a bit. [90] Not that it should get hot, but just warm. [91] In that way it becomes a little more fluid, uh, without it becoming too liquid, [92] and then it actually solidifies faster when it's been spread on the slightly cooled rolls. [...]

Mette: [*Moving away from the stove, still holding the saucepan with the icing, and moving over to the kitchen table where the girls are waiting*] [93] Like that. [94] What I have made is a somewhat thick icing. [95] Try looking here. [*Tilting the saucepan to the camera and stirring the contents*] [96.1] It is still fluid, [96.2] but it is not transparent. [97.1] We'll leave it here in the middle, [97.2] and then we'll just move the rolls over here so you can work, girls.

[*Camera zooms in on the girls' hands spreading the icing on the rolls.*]

Mette: [98] Can you make it suffice?

Laura: [99] Yes, it's fine.

Mette: [*Chuckling*] [100] It's just going to be just enough, I think.

Mette: [*Looking into the camera*] [101.1] Now we have put the rolls on a plate here, [101.2] and they still have a little bit of heat in them, [101.3] so they smell really good. [102] Now I think we have a couple of lassies here who are looking forward to tasting [the rolls]. [103] Will you snatch one and tell [us] what they are like?

Both girls in unison: [104] Yes.

Mette: Mmm. [*Chewing a roll*] [105] What do you say, Maja?

Maja: [106] Oh, they're good. [107] Pardon me for using swear words, but they're damn good.

Mette: [*Chuckles*] [108] I think they are, too.

Dansk originaltekst

Mette: Nu skal vi simpelthen til at kaste og i gang med de her kanelnegle, som jo er en lidt blød, lækker gærdej. Og Laura, du må godt, øh, flække vaniljestangen der og så, øh, skrabe kornene ud og så mase dem rigtig godt i sukkeret der, så de bliver fordelt. Maja, vi skal have lunet noget mælk. Vil du komme herover og smide den på komfuret. Så ... og så skal den på ... fire.

[*Maja puts a saucepan with the milk on the stove and sets the hotplate to '4'.*]

Godt. Super. Så. Også vaniljesukkeret. Jep. Og så skal vi ha' ... kanel og salt. Laura, du tager sukkeret.

Laura: Sådan.

Mette: Yes.

Maja: Sådan?

Mette: Yes. Ingefær og kardemomme. Sådan, Maja. Yes. Super godt. [...] Så kommer jeg lige en lille smule mel op til æggene og krydderierne, så ikke det bliver for varmt. Henter du en pakke gær ovre i køleskabet?

Maja: Ja.

Mette: Her. Og så i med mælken her. Du skal lige vente lidt med smørret, Maja. Vi skal lige have gæren i først. Så smuldrer du den lige i, ikke også?

Maja: Uden at det kommer ud over hele bordet.

Mette: Mm.

[*Laura holds a packet of yeast over the bowl of a food mixer and starts squeezing it.*]

Mette: Bare smuldr den.

Laura: Så er det mig.

Mette: Så skal vi lige have startet banditten først. Og så ved du godt, at man må aldrig nogen sinde komme fingrene i, vel?

[*Mette starts the food mixer.*]

Mette: Så kommer vi smørret i lige om lidt. [...] Laura, så giver du den lige en stor skefuld mel mere eller to, faktisk, og så kommer Maja smørret i. Jeg kommer jo med vilje ikke, øh, smørret ned til gæren, vel, for så kan den slet ikke trække vejret og virke. Hele gøje-møjet i, Maja. [...] Smadder godt. Yes, sådan. Sådan skal det gøres. Pas på lapperne. Og så starter du den stille og roligt.

[*Maja starts the food mixer.*]

Mette: Sådan.

Mette: [*looking into the camera*] Her der står dejen jo simpelthen bare og ælter og faktisk får lov til at ... ikke højere end 2, Maja ... og får lov til at, øh, ælte færdig, så den bliver smidig og glat. Det er meget vigtigt, når man laver sådan nogle gærdeje, at de ikke bliver, øh, tørre. Det må de simpelthen ikke. Det skal være en smidig, lind, lækker dej, for så ender bagværket også med at blive smidigt og lækkert og fugtigt at spise. [...]

[*Food mixer whirrs, and after turning it off, Mette unloads the dough onto the kitchen table.*]

Mette: [*Looking into the camera*] Se, min erfaring er, at rigtig, rigtig mange laver sådan nogle gærdeje her alt for tørre, fordi man synes, det er sådan lidt nasset og stå og fedte rundt med. Det samme, når vi laver brød, som vi bare skal spise til vores morgenmad. [...] Jeg vælger at lave den ret lind, men så har jeg til gengæld lagt en del mel på bordet, fordi det der med først at lægge ud med en knoldet dej, som er så tør at hverken kan hugge eller stikke i den, og rulle ud i yderligere mel, så bliver det altså noget tørt noget. [...] Nu skal den lige ligge og hvile her, og imens så skal Maja lave en remonce. [...]

[*Camera follows Maja mixing ingredients in the food mixer.*]

Det ser altså godt ud, Maja. Kan du se, så bliver den sådan lidt luftig nu, ikke? [...]

[*Camera shows the dough now spread out on the kitchen table.*]

Mette: [*Looking into the camera.*] Jeg begynder bare at mærke på, om dejen er begyndt at, øh, blive smidig, her når den har ligget lidt på bordet. Så vil den allerede begynde at kunne give efter. Den er ved at være klar til udrulning.

[*Camera turns to focus on the bowl with the remonce made by Maja for a few seconds and then pans out.*]

Mette: Super, Maja. Sådan skal den klares.

Mette: Så stiller jeg lige den her herover et øjeblik.

[*Mette starts rolling out the dough.*]

Mette: Jeg forsøger jo at lave sådan et rektangel, som er lidt 'hjørnet'. Det er vigtigt, det er sådan lidt, lidt skarpt i hjørnerne, så jeg får udnyttet hele dejen. Det er selvfølgelig også lidt øvelse, men det kan være sådan en lille udfordring, man giver sig selv, at gøre det så firkantet som muligt. [...] Sådan der.

[*Camera shows the two daughters spreading the remonce on the rectangle of dough.*]

Mette: [*Looking into the camera.*] Så er der simpelthen ved at være remonce ud over hele balladen her.

Mette: [*Looking down on the dough.*] Super, så triller jeg den til snegle her. Så smider I de der over til vask. Paletterne. [*Looking into the camera.*] Se, så tager jeg jo simpelthen bare og triller en, øh, sneglepølse her. Sørg for, at de er sådan lidt stramme, eller pølsen er lidt stram. Det kan man godt sådan lige stramme lidt op undervejs, mens jeg ruller.

[*Camera shows 15 small, round baking tins placed on a baking tray. Mette sprays the tins with liquid grease.*]

Mette and the daughters chant a sing-song in unison while cutting the rolled-up 'sausage' of dough into slices and placing these into the baking tins.]

Mette: Sådan. Laura, lægger du dem på så. [...] [*Looking into the camera.*] Se, nu skal, øh, sneglene faktisk bare stå og hæve, og det har de faktisk rigtig godt af at gøre, afhængig af rumtemperaturen, en times tid, sådan så de bliver luftige og lækre. Vi har jo valgt at komme dem i de her forme. Faktisk, øh, både for at beholde formen,

øh, det er ret lækkert, at de bliver styret, når de kommer i ovnen, at de ikke bare vokser til ukendelighed, øh, og dernæst er det også rigtig lækkert, synes jeg, at, øh, remoncen bliver liggende i sneglen og ikke bare forsvinder ud på bagepladen. Så nu skal de bare stå et lunt sted i en times tid, inden de skal i ovnen.

[*Camera shows the daughters brushing the rolls with egg.*]

Nu bliver der altså penslet på livet løs her, og det er simpelthen bare æggeblomme og så lidt vand og lidt sukker, som pigerne pensler med. Det er bare, for at sneglene får sådan et lidt blankt udtryk. Det er rigtig pænt.

[*Mette takes the baking tray with the rolls and moves to the oven.*]

Mette: [*Looking into the camera*] Så sætter jeg dem i ovnen. Jeg bager dem på lidt mere end 200 grader, for at de faktisk på ydersiden bager ret hurtigt. Øh, når det er sådan en gærdej her, skal den stadigvæk være blød indeni.

[*Puts the tray in the oven.*]

[*Takes the tray out.*]

Mette: Sådan her. [*Looking into the camera.*] Så lader vi dem lige stå her på køkkenbordet og køle lidt af, indtil vi laver glasuren og kommer den på.

[...]

Mette: [*Producing a saucepan and pouring ingredients into it*] Nu skal jeg have lavet glasuren her til sneglene. Flormelis og vand. [*Stirring the contents of the saucepan on the stove*] Så har jeg faktisk tændt lidt for blusset her, så jeg får lunet det lidt. Ikke at det skal blive varmt, men bare lunt. Så render det lidt lettere, øh, uden at det er for tyndt, og så storkner det faktisk også hurtigere, når det er kommet på de let afkølede snegle. [...]

Mette: [*Moving away from the stove, still holding the saucepan with the icing, and moving over to the kitchen table where the girls are waiting*] Sådan der. Jeg har jo lavet en lille smule tyk glasur. Prøv at kigge her. [*Tilting the saucepan to the camera and stirring the contents*] Den flyder stadigvæk, men den er altså ikke gennemsigtig. Vi lader den stå her i midten, og så rykker vi lige sneglene herhen, så I kan arbejde, piger.

[*Camera zooms in on the girls' hands spreading the icing on the rolls.*]

Mette: Kan I lige få det til at række?

Laura: Ja, det går fint.

Mette: [*Chuckling*] Det kommer lige til at passe, tror jeg.

Mette: [*Looking into the camera*] Så har vi fået lagt sneglene på fad her, og de har stadig en lille smule varme i sig, så de dufter rigtig godt. Så tror jeg, der er et par trunter, der glæder sig til at smage. Snupper I én og fortæller, hvordan de er?

Both girls in unison: Ja.

Mette: Mmm. [*Chewing a roll*] Hvad siger du, Maja?

Maja: Åh, de er gode. Undskyld jeg bander, men de er altså skidegode.

Mette: [*Chuckles*] Det synes jeg altså også, de er.

Source:

Olsen, S. (Director). 2012. *Det søde liv [Sweet Life]*, season 1, episode no. 6. Danmarks Radio.
https://www.dr.dk/drtv/se/det-soede-liv_190096. Accessed 13 November 2023.

Appendix B: TED talk

[1] [00:01] A few years ago, I broke into my own house. I had just driven home, it was around midnight in the dead of Montreal winter, I had been visiting my friend, Jeff, across town, and the thermometer on the front porch read minus 40 degrees -- and don't bother asking if that's Celsius or Fahrenheit, minus 40 is where the two scales meet -- it was very cold. And as I stood on the front porch fumbling in my pockets, I found I didn't have my keys. In fact, I could see them through the window, lying on the dining room table where I had left them. So I quickly ran around and tried all the other doors and windows, and they were locked tight. I thought about calling a locksmith -- at least I had my cellphone, but at midnight, it could take a while for a locksmith to show up, and it was cold. I couldn't go back to my friend Jeff's house for the night because I had an early flight to Europe the next morning, and I needed to get my passport and my suitcase.

[2] [00:56] So, desperate and freezing cold, I found a large rock and I broke through the basement window, cleared out the shards of glass, I crawled through, I found a piece of cardboard and taped it up over the opening, figuring that in the morning, on the way to the airport, I could call my contractor and ask him to fix it. This was

going to be expensive, but probably no more expensive than a middle-of-the-night locksmith, so I figured, under the circumstances, I was coming out even.

[3] [01:24] Now, I'm a neuroscientist by training and I know a little bit about how the brain performs under stress. It releases cortisol that raises your heart rate, it modulates adrenaline levels and it clouds your thinking.

[4] [01:43] So the next morning, when I woke up on too little sleep, worrying about the hole in the window, and a mental note that I had to call my contractor, and the freezing temperatures, and the meetings I had upcoming in Europe, and, you know, with all the cortisol in my brain, my thinking was cloudy, but I didn't know it was cloudy because my thinking was cloudy.

[5] [02:03] And it wasn't until I got to the airport check-in counter, that I realized I didn't have my passport. So I raced home in the snow and ice, 40 minutes, got my passport, raced back to the airport, I made it just in time, but they had given away my seat to someone else, so I got stuck in the back of the plane, next to the bathrooms, in a seat that wouldn't recline, on an eight-hour flight. Well, I had a lot of time to think during those eight hours and no sleep.

[6] [02:32] And I started wondering, are there things that I can do, systems that I can put into place, that will prevent bad things from happening? Or at least if bad things happen, will minimize the likelihood of it being a total catastrophe. So I started thinking about that, but my thoughts didn't crystallize until about a month later. I was having dinner with my colleague, Danny Kahneman, the Nobel Prize winner, and I somewhat embarrassedly told him about having broken my window, and, you know, forgotten my passport, and Danny shared with me that he'd been practicing something called prospective hindsight.

[7] [03:08] It's something that he had gotten from the psychologist Gary Klein, who had written about it a few years before, also called the pre-mortem. Now, you all know what the postmortem is. Whenever there's a disaster, a team of experts come in and they try to figure out what went wrong, right? Well, in the pre-mortem, Danny explained, you look ahead and you try to figure out all the things that could go wrong, and then you try to figure out what you can do to prevent those things from happening, or to minimize the damage.

[8] [03:36] So what I want to talk to you about today are some of the things we can do in the form of a pre-mortem. Some of them are obvious, some of them are not so obvious. I'll start with the obvious ones.

[9] [03:47] Around the home, designate a place for things that are easily lost.

[10] [03:59] Now, this sounds like common sense, and it is, but there's a lot of science to back this up, based on the way our spatial memory works. There's a structure in the brain called the hippocampus, that evolved over tens of thousands of years, to keep track of the locations of important things -- where the well is, where fish can be found, that stand of fruit trees, where the friendly and enemy tribes live. The hippocampus is the part of the brain that in London taxicab drivers becomes enlarged. It's the part of the brain that allows squirrels to find their nuts. And if you're wondering, somebody actually did the experiment where they cut off the olfactory sense of the squirrels, and they could still find their nuts. They weren't using smell, they were using the hippocampus, this exquisitely evolved mechanism in the brain for finding things. But it's really good for things that don't move around much, not so good for things that move around. So this is why we lose car keys and reading glasses and passports.

[11] [05:00] So in the home, designate a spot for your keys -- a hook by the door, maybe a decorative bowl. For your passport, a particular drawer. For your reading glasses, a particular table. If you designate a spot and you're scrupulous about it, your things will always be there when you look for them.

[12] [05:12] What about travel? Take a cell phone picture of your credit cards, your driver's license, your passport, mail it to yourself so it's in the cloud. If these things are lost or stolen, you can facilitate replacement.

[13] [05:25] Now these are some rather obvious things. Remember, when you're under stress, the brain releases cortisol. Cortisol is toxic, and it causes cloudy thinking. So part of the practice of the pre-mortem is to recognize that under stress you're not going to be at your best, and you should put systems in place.

[14] [05:43] And there's perhaps no more stressful a situation than when you're confronted with a medical decision to make. And at some point, all of us are going to be in that position, where we have to make a very important decision about the future of our medical care or that of a loved one, to help them with a decision.

[15] [06:00] And so I want to talk about that. And I'm going to talk about a very particular medical condition. But this stands as a proxy for all kinds of medical decision-making, and indeed for financial decision-making, and social decision-making -- any kind of decision you have to make that would benefit from a rational assessment of the facts.

[16] [06:19] So suppose you go to your doctor and the doctor says, "I just got your lab work back, your cholesterol's a little high." Now, you all know that high cholesterol is associated with an increased risk of cardiovascular disease, heart attack, stroke. And so you're thinking having high cholesterol isn't the best thing, and so the doctor says, "You know, I'd like to give you a drug that will help you lower your cholesterol, a statin." And you've probably heard of statins, you know that they're among the most widely prescribed drugs in the world today, you probably even know people who take them. And so you're thinking, "Yeah! Give me the statin."

[17] [06:55] But there's a question you should ask at this point, a statistic you should ask for that most doctors

don't like talking about, and pharmaceutical companies like talking about even less. It's for the number needed to treat. Now, what is this, the NNT? It's the number of people that need to take a drug or undergo a surgery or any medical procedure before one person is helped. And you're thinking, what kind of crazy statistic is that? The number should be one. My doctor wouldn't prescribe something to me if it's not going to help. But actually, medical practice doesn't work that way. And it's not the doctor's fault, if it's anybody's fault, it's the fault of scientists like me. We haven't figured out the underlying mechanisms well enough. But GlaxoSmithKline estimates that 90 percent of the drugs work in only 30 to 50 percent of the people. So the number needed to treat for the most widely prescribed statin, what do you suppose it is? How many people have to take it before one person is helped? 300. This is according to research by research practitioners Jerome Groopman and Pamela Hartzband, independently confirmed by Bloomberg.com. I ran through the numbers myself. 300 people have to take the drug for a year before one heart attack, stroke or other adverse event is prevented.

[18] [08:12] Now you're probably thinking, "Well, OK, one in 300 chance of lowering my cholesterol. Why not, doc? Give me the prescription anyway." But you should ask at this point for another statistic, and that is, "Tell me about the side effects." Right? So for this particular drug, the side effects occur in five percent of the patients. And they include terrible things -- debilitating muscle and joint pain, gastrointestinal distress -- but now you're thinking, "Five percent, not very likely it's going to happen to me, I'll still take the drug." But wait a minute. Remember under stress you're not thinking clearly. So think about how you're going to work through this ahead of time, so you don't have to manufacture the chain of reasoning on the spot. 300 people take the drug, right? One person's helped, five percent of those 300 have side effects, that's 15 people. You're 15 times more likely to be harmed by the drug than you are to be helped by the drug.

[19] [09:04] Now, I'm not saying whether you should take the statin or not. I'm just saying you should have this conversation with your doctor. Medical ethics requires it, it's part of the principle of informed consent. You have the right to have access to this kind of information to begin the conversation about whether you want to take the risks or not.

[20] Now you might be thinking I've pulled this number out of the air for shock value, but in fact it's rather typical, this number needed to treat. For the most widely performed surgery on men over the age of 50, removal of the prostate for cancer, the number needed to treat is 49. That's right, 49 surgeries are done for every one person who's helped. And the side effects in that case occur in 50 percent of the patients. They include impotence, erectile dysfunction, urinary incontinence, rectal tearing, fecal incontinence. And if you're lucky, and you're one of the 50 percent who has these, they'll only last for a year or two.

[21] [10:00] So the idea of the pre-mortem is to think ahead of time to the questions that you might be able to ask that will push the conversation forward. You don't want to have to manufacture all of this on the spot. And you also want to think about things like quality of life. Because you have a choice oftentimes, do you want a shorter life that's pain-free, or a longer life that might have a great deal of pain towards the end? These are things to talk about and think about now, with your family and your loved ones. You might change your mind in the heat of the moment, but at least you're practiced with this kind of thinking.

[22] [10:33] Remember, our brain under stress releases cortisol, and one of the things that happens at that moment is a whole bunch of systems shut down. There's an evolutionary reason for this. Face-to-face with a predator, you don't need your digestive system, or your libido, or your immune system, because if your body is expending metabolism on those things and you don't react quickly, you might become the lion's lunch, and then none of those things matter. Unfortunately, one of the things that goes out the window during those times of stress is rational, logical thinking, as Danny Kahneman and his colleagues have shown. So we need to train ourselves to think ahead to these kinds of situations.

[23] [11:15] I think the important point here is recognizing that all of us are flawed. We all are going to fail now and then. The idea is to think ahead to what those failures might be, to put systems in place that will help minimize the damage, or to prevent the bad things from happening in the first place.

[24] [11:36] Getting back to that snowy night in Montreal, when I got back from my trip, I had my contractor install a combination lock next to the door, with a key to the front door in it, an easy to remember combination. And I have to admit, I still have piles of mail that haven't been sorted, and piles of emails that I haven't gone through. So I'm not completely organized, but I see organization as a gradual process, and I'm getting there.

Source:

Levitin, D. 2015. *How to stay calm when you know you'll be stressed*. TED talks.

https://www.ted.com/talks/daniel_levitin_how_to_stay_calm_when_you_know_you_ll_be_stressed. Accessed 13 November 2023.