

Older adults' conversations and the emergence of "narrative crystals"

A new approach to frequently told stories

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Energized by seminal scholarship within narrative studies; communication studies of aging and dementia; and formulaic language, we examined a wide range of stories told multiple times within two different longitudinal collections of verbal interactions involving two women in their 80s (one US American; one French). Based on multifaceted analyses of these longitudinal series of stories, we identified a new type of narrative, the "narrative crystal". We characterize the internal formal architecture of two illustrative crystals (one from each corpus) before illuminating how such crystals function for their speakers as reassuring interactional "stepping stones" within their larger discourse surroundings. Our findings sketch a possible developmental process regarding how meaningful personal experiences come to be transformed over the lifespan: from the inchoate qualities of first-time tellings shaped by the interaction, through incrementally increased stability over the course of many tellings, to reach the highly durable nature of narrative crystals.

Keywords: narrative, aging, dementia, retelling, formulaic language, memory, family discourse

"First bell's ringing": one of nine tellings by Ms. Taylor (Carolinas Conversations Collection)

I can hear my mother on Sunday morning
we went to a Lutheran Church in Brookfield
and I can hear my mother on Sunday morning
"all right children
the first bell's ringing
if you're not ready
you better be gettin' ready"
we knew to be ready

“*Sunday concert*”: one of eight tellings by Ms. Moreau (LangAge corpora)

on Sunday I always remember that there was
we had radios with lamps on top
you know these were the first the first devices
and every Sunday afternoon
there were the Concerts Colonne
at that time that’s what they were called
from Paris which broadcasted a conce- a concert
so my father
I still see him sitting astride his chair
and we were not allowed to disturb him
he was listening to his concert¹

Introduction: Discovering narrative crystals

Motivated by our mutual interest in and engagement with foundational scholarship at the intersection of narrative studies and aging, we embarked² on a collaborative study to compare identity construction as evidenced in French- and English-language collections of personal experience narratives retold over time by older adults. We anticipated focusing on (1) the ways in which these narratives related to the surrounding conversational interaction, with special attention to how they were sparked by verbal and non-verbal triggers in the immediate situation; (2) the ways in which conversational partners contributed to the emergence and telling of these narratives, as well as the ways in which narrators accommodated their tellings to varying levels of displayed interest and shared knowledge on the part of listeners; (3) the use of formulaic and prefabricated language, including proverbs, idioms, and particularly durable instances of constructed dialogue (Tannen, 2007), to help convey the narrators’ points; and (4) the ways in which specific linguistic details (e.g., related to epistemics, affect, and agency) revealed how speakers understood relationships between experiences underlying these narratives and larger issues of causality, continuity, and coherence within their more expansive life stories (see Linde, 1993).

1. The original French language transcript is provided in the appendix.

2. We are grateful to the Alexander von Humboldt Foundation for its generous support of our scholarship in the form of a Humboldt Research Award at the University of Potsdam (Germany) in 2020. We also appreciate the valuable feedback provided by two anonymous reviewers of an earlier version of this paper. We sincerely thank the *équipe* behind LangAge corpus, especially Julie Marie Kairat and Marta Lupica Spagnolo.

Before beginning our collaboration on this project, we had focused separately on different aspects of the larger narrative enterprise, with AG exploring the “sameness” of prosodic features (Gerstenberg, 2014) as well as the possibility of identifying generational styles in oral storytelling (Gerstenberg, 2019), and HH examining “narrative traces” in late-stage dementia (Hamilton, 2008) and highlighting personal agency as displayed in narratives told by members of a memory loss support group (Hamilton & Baffy, 2014). From these distinct but connected perspectives, we came to our work with an understanding of the significant challenge that faces scholars in this area: how to examine age- and health-related changes in communication without contributing to a detrimental deficit model of aging and dementia (Coupland et al., 1988).

Within the first few weeks of the project, we immersed ourselves in the recordings of our two very different longitudinal data sets (twenty-five informal conversations in English held over seven months with 84 year-old Ms. Taylor; and eight extensive life story interviews in French conducted over a nine-year period with Ms. Moreau beginning when she was 83 years old). As we interwove observations from our parallel solitary data sessions with insights from our combined workshops and discussions, we found ourselves gripped by the sheer number of utterances that popped up repeatedly across many interactions in our corpora; e.g., “*I can hear my mother on Sunday morning*,” and “*il écoutait son concert*” (‘he [my father] was listening to his concert’). It became impossible to ignore the power of melody associated with these utterances that echoed in our minds between data sessions – when we both experienced a memorable ringing in our ears of what had by then become familiar intonation contours; e.g., “*All right children, the first bell’s ringing*,” and “*on avait des postes à radio avec des lampes dessus*” (‘we had radios with lamps on top’). We soon decided that the similarities we had uncovered in our two very different discourse corpora were compelling enough to warrant a shift from our original focus on identity construction to the creation of a model of what we would eventually come to identify and call “narrative crystals.”

Through our iterative process of repeated listening; comparison of observations; prosodic and discourse analyses; and engagement with key scholarship on narrative analysis, discourse and aging, and discourse and dementia, we gradually identified striking similarities in both discursive form and function, centering on (1) the crystallized nature of one or more sequences (what we term the “crystallized core”) within the frequently told stories – to the point where the propositional content, lexical items, sentence structure, intonation contour, pronunciation, pitch, rhythm, and pacing³ were virtually the same across tellings –

3. Many of these cores had a song-like quality that made them very memorable to us as analysts and may indeed have contributed to their ease of use by the individuals in our study.

and supplementary sets of optional and/or rearrangeable building blocks that surrounded these cores (see sections “Many ways to recount the past in discourse” and “Recounting the past in old age”), that together formed the narrative crystals; and (2) the ways in which both sets of narrative crystals seemed to function as figurative “stepping stones” (see section “Narrative crystals as stepping stones”) to help both women gain (and regain) their figurative bearings as they navigated the challenging “rushing stream” of ongoing conversation.

In order to accelerate our evolving understanding of this phenomenon, we decided to pursue a two-pronged process that would capitalize on our different research approaches and areas of expertise. In this effort, we used different methods to uncover similarities and differences across retellings within our own data sets, both in terms of the narrative crystals’ formal internal architectures and the ways in which they related to their discourse surroundings. In addition, we developed individual approaches to corpus-specific phenomena: AG examined the relatively more flexible narrative crystals within her longitudinal data set that spanned a nine-year path from healthy aging to early stages of dementia, connecting evidence of differences in articulation rate to the notion of stepping stones; HH examined the relatively more tightly consolidated narrative crystals within her set of much shorter conversations held over seven months with an individual at a moderate stage of dementia, illuminating their function within the management of discourse topics in ongoing interaction.

Through this process, we came to see that our work on narrative crystals constituted the next step in three key lines of research: (1) the longitudinal profile of communicative changes associated with dementia proposed by Hamilton (1994, pp.37–77) that describes such changes in connection to frameworks of taking the role of the other (Mead, 1934) and automaticity (Whitaker, 1983, p.200); (2) the integrated model of formulaic language proposed by Wray and Perkins (2000, p.9) that understands formulaicity as “operating within our general linguistic and interactional competence” and “accommodate[ing] both moment-by-moment and developmental changes in the individual’s processing and communicational agendas”; and (3) work by Barth-Weingarten, Schuman and Wohlfahrt (2012) that characterizes the prosodic-phonetic parameters of anchor points within retold stories by the very old.

Situated in connection with such approaches that require longitudinal data sets, our research synthesizes and extends the seminal work highlighted above in both formal and functional ways: first, by examining relative formulaicity within the *formal internal architecture* of personal experience narratives (moving beyond the canon of texts shared by a community of speakers, including sayings, literary quotes, song lyrics, metacommunicative phrases, etc.); and secondly, by investigating the ways in which these frequently told stories relate to and *function*

within their discourse surroundings as a way to glean insights into the “stages of the journey that a given sequence makes across time in the mouth of a given speaker” (Wray & Perkins, 2000, p.6). Together our findings sketch a possible developmental process as to how meaningful personal experiences come to be transformed – in association with cognitive and communicative changes that accompany dementia – from the inchoate qualities of first-time tellings through growing increased stability over the course of many tellings to the highly durable nature of narrative crystals.

Many ways to recount the past in discourse: Our focus on “scenes”

In our search for narratives within our data sets, we cast a wide net. Following Chafe's (1998, p.270) claim that the experience underlying a given narrative is “richer and more comprehensive than any particular way in which it may be verbalized”, we decided to extend our investigation beyond canonical Labovian (1972) narratives (i.e., those that recount one-time out-of-the-ordinary personal experiences) to include the much wider range of narratives envisioned by Ochs and Capps (2001) in their five-dimensional model of narratives-in-interaction. Especially important to our work were their dimensions of “tellability” and “moral stance”, as these dimensions encouraged us to keep our eyes and ears open for habitual narratives (Carranza, 1998) and small stories (Bamberg & Georgakopoulou, 2008) that occurred multiple times within our conversations.

Our inclusion of non-Labovian discursive representations of past experiences allowed us to consider how quotidian events in these women's lives could be understood as meaningful and deserving of narration, not because they were *out-of-the-ordinary*, but because they were *ordinary*. These brief narrative-like discourses recounted events within their families that happened again and again in the same way – and that had seemingly acquired enormous importance over the course of these women's lived experiences.⁴ Along this journey, our greatest insights emanated from our engagement with Tannen's (2008, p.207–208) characterization of discursively-created “scenes”; in this work, Tannen points to the “importance of repetition, dialogue, and details” as they combine “to create scenes in which people are engaged in culturally-identifiable and personally meaningful interactions or activities” and argues that speakers construct these scenes to support whatever points they are trying to make in their interactions with others.

4. Future investigations may discern that these crystallized frequently told stories are connected to episodes of deep personal importance within the life stories of individual narrators – and therefore provide a clear link between this extreme form of formulaic narration and discursive identity construction – but such concerns fall necessarily outside the scope of this paper.

In addition to the identification of these discursively-created scenes, it was of critical importance to the building of our collections of narrative crystals (as is clear from what we have written above) that these scenes be drawn upon repeatedly by our speakers across the conversations in each data set. It was only through a fine-grained comparison and contrast of language used in multiple tellings that we were able to differentiate the brief, stable and virtually unvarying sequences that we subsequently identified as the crystallized cores (along with associated building blocks that surrounded them) from other kinds of recountings that contained large amounts of intonational, lexical, and syntactic variation (e.g., that did not have this crystallized quality).

In our analyses of the similarities and differences across retellings, we focused on specific ways in which the two women encapsulated their multisensorial experiences in the language they selected to represent their experiences (e.g., in the introductory excerpt above: “*I can hear my mother on Sunday morning*”; “*I still see him [my father] sitting astride his chair*”). We also considered which aspects of the storyworld (physical setting, persons, objects, actions, utterances, thoughts, sights, sounds, smells, tastes, feelings, etc.) underlying their narrative tellings were conveyed in crystallized cores or in surrounding building blocks.

As a result of our examination of frequently told stories, HH identified seven narrative crystals and AG identified eight narrative crystals within the corpora see (characterized in section “Description of data collections and narrators”). To allow for sufficient comparative detail, we each introduce and explore this phenomenon through *single* narrative crystals that evoke scenes related to Sunday traditions in these women’s childhood homes: Ms. Taylor recounted hearing her mother’s regular Sunday morning reminder to her ten children that they “better be gettin’ ready” to go to church; Ms. Moreau recalled watching her father listening undisturbed to his favorite Sunday afternoon concert on the radio. These scenes appeared in eight different conversations within each corpus.

Recounting the past in old age: Narrative retellings in healthy aging and dementia

As we carried out our study, we considered how our emerging findings corroborated, extended or offered new perspectives on the rich multi- and interdisciplinary traditions connecting narrative (particularly narrative retellings) to aging and dementia. Such research on narrative production across the lifespan has yielded a complex patchwork of findings related to cognitive, sociocultural, and interactional dimensions of the problem. Some studies have found that an individual’s ability to integrate emotional and cognitive aspects of experience increases across the lifespan, while processing may be affected by age-related

declines in fluid intellectual abilities (Pasupathi & Mansour, 2006, p. 800). Others have observed that narrative complexity may increase over time, while limitations in working-memory may affect textual cohesion (Kemper, 1990, pp. 220–221; for further discussion, see Gerstenberg, 2020 and Hamilton & Hamaguchi, 2015.)

One of the central findings cross-cutting this research is that older speakers frequently repeat their stories. Although this practice is certainly not limited to old age, as demonstrated by case studies in Schumann et al. (2015), Chafe (1998) and Norrick (1998), the number of narratives that older individuals retell, as well as the frequency with which each is retold, make retellings by older individuals seem quite different from retellings by younger individuals. Some repeated stories are in the form of canonical Labovian narratives (Labov, 1972) told about highly reportable one-time experiences from the narrators’ past; others are habitual narratives that characterize how things “used to be”.

Special interactional challenges may arise in connection with those in the aging population who develop dementia (Frankenberg et al., 2021). Since individuals with early to moderate dementia typically can recall and relate personal experiences from the distant past – sometimes in vivid linguistic detail (Astell et al., 2010) – for the most part, healthy conversation partners struggle primarily with how frequently the narratives are repeated, and have no problems with the discursive shape of the narratives themselves. In some situations, speakers appear not to recall that they have already recounted a particular personal experience to their interlocutors; in other cases, the connection between a repeated narrative and the flow of the ongoing interaction may not be obvious to a given listener despite appearing to “capture something important in the way the person makes sense of his or her life” (Hydén & Örvulv, 2009, p. 206). In more advanced stages of dementia these narratives may come in the form of fleeting opaque small stories (Bamberg & Georgakopoulou, 2008) that occasionally surface as single-utterance narrative traces (Hamilton, 2008) evoking earlier times or places.

In our view, our insights regarding “narrative crystals” contribute to the following possible understanding of the life course of particular stories within the life of an individual: as individuals transform personally meaningful experiences into narratives and share them frequently with others, aspects of these narratives (propositional content, lexical items, sentence structure, intonation contour, pronunciation, pitch, rhythm, or pacing) may become increasingly consolidated. We speculate that the resulting narrative ensembles (i.e., the crystallized core and surrounding building blocks) may display increased formulaicity over time, as linguistic accommodation to particularities of given interactional situations decreases.

Preview

In what follows we characterize our corpora in more detail (Carolinas Conversations Collection and LangAge), along with the two women whose narratives are at the center of this study, and document the narrative crystals we identified within and across our interactions (section “Description of data collections and narrators”). In the section “The internal architecture of narrative crystals”, we then describe the internal architectures of single narrative crystals from each corpus, including their hallmark cores and supplementary sets of building blocks. In the section “Narrative crystals as stepping stones”, we focus our attention on how smaller sets of these narrative crystals function within single conversations from each corpus, with HH examining discursive bridges that connect the dyadic interaction of ongoing conversation to the telling of these very short consolidated narratives and AG connecting evidence of changes in articulation rate to the notion of stepping stones. In our closing comments in our section “Conclusion and implications”, we consider how the identification of this phenomenon contributes to emerging understandings of narratives, formulaic language, and dementia discourse, and sketch out next steps for continued research in these areas.

Description of data collections and narrators

At first blush, the two series of recordings and transcripts at the center of this study differ in more ways than they are the same: as noted earlier, as part of the Carolinas Conversations Collection (CCC as described in Pope & Davis, 2011), Ms. Taylor was living with a moderate stage of dementia and participated in twenty-five relatively brief open-ended, informal conversations (most were ten-fifteen minutes) in her native language of English with twenty different student visitors to her North Carolina (USA) assisted living residence over a period of seven months (2005–2006). In contrast, as part of the LangAge collection, Ms. Moreau participated in eight relatively extensive (ca. forty-five minutes) life story interviews in her native language of French with the same individual (AG), over a nine-year period from 2005 until 2014 near Orléans, France; she was diagnosed with dementia in 2013 (see Gerstenberg, 2015 for a more detailed corpus description). Because of these differences across data sets, we initially conducted our analysis of repeated stories independently for each corpus. Within our separate analyses, however, striking parallels emerged that led to our discovery of narrative crystals. This discovery served as an inflection point in our inquiry, as we then focused subsequent analyses on the direct comparison of the narrative crystals;

this comparability is justified by the similarity of the interview series in two crucial respects: (1) both are longitudinal series that allowed us to compare and contrast multiple versions of the same personal experiences; and (2) both comprised dyadic intergenerational interactions in which the younger conversation partner was interested in learning from the older one about earlier times and places. This situation created nurturing interactional environments in which the older conversation partner had epistemic primacy over the majority of discourse topics, leading to the (re)telling of a range of personal experience narratives.

To identify all such narratives that recurred within these interactions, we scoured our longitudinal data sets, focusing primarily on our own collections, but meeting frequently to discuss our partner's findings. Using a bottom-up approach characterized by repeated listening to the full set of audio-recordings, repeated reading of associated transcripts, use of lexical queries (within their respective corpus architecture) and PRAAT (Boersma, 2001) for prosodic analyses, we identified and isolated events that Ms. Taylor and Ms. Moreau not only recounted multiple times across these interactions but that appeared to contain one or more relatively stable cores surrounded by a more flexible geometry of building blocks. Based on our deep engagement with the data, we conceptualized and fine-tuned a model of "narrative crystals" in order to provide us with a systematic way to compare our narratives.

In our subsequent examinations, we considered each building block to be associated with one anchor undergirding a given storyworld (i.e., reference to persons, time, space, objects, activities, and states; see Hamilton, 2008 for discussion). Since individual textual representations of a given building block sometimes varied in terms of lexical choice, sentence structure, intonation contour, pronunciation, pitch, rhythm, and/or pacing, we found it useful to conceive of particular instances falling along a continuum from "highly variable" to "highly stable". Within whole sets of building blocks associated with individual narrative crystals, we identified "crystallized cores" that were not only part of each telling but, in contrast to other building blocks, highly stable in terms of (some combination of) lexicon, grammar, and prosody.⁵ Beyond the variation within the building blocks' linguistic representations, we also observed variation in the sequencing of these blocks across tellings (with some blocks not appearing at all in a given telling), leading to our claim that narrative crystals are most fruitfully conceptualized as "ensembles".

5. In several intriguing instances, we have noted that prosodic traits, such as intonation contours or rhythmic patterns, can be stable even when the lexical material used in the building block is not. Exploration of this intriguing phenomenon extends beyond the scope of this paper, but warrants further attention.

As noted earlier, as a result of our investigations we identified a total of fifteen distinct narrative crystals (seven in the CCC corpus; eight in the LangAge corpus), each of which was retold multiple times, in our combined recordings.

Carolinas Conversations Collection and Ms. Taylor

Ms. Taylor (84 year-old woman living with a moderate stage of dementia) resided in an assisted living community in an urban area of North Carolina (USA) that served as a resource for the service-learning component in an introductory gerontology class at University of North Carolina-Charlotte. As part of the course, students were asked to visit and talk for a total of ten hours over a semester with an older person, preferably one with dementia, who lived in one of these assisted living communities, and to record at least one of their conversational interactions (see Davis, 2011). During these conversations, Ms. Taylor and her student visitors tended to talk about Ms. Taylor's upbringing as one of ten children within a family that centered its activities on church, family gatherings, and work. Ms. Taylor clearly reveled in these forays into her past as she frequently remarked that, despite the fact that her family did not have a great deal of money, "I wouldn't take nothing for my upbringing."

In what follows, we characterize the seven narrative crystals (hereafter marked in bold italics) we identified within and across twenty-five conversations (nineteen of the twenty-five conversations contained at least one telling of a narrative crystal) recorded between October 2005 to April 2006.

Most of Ms. Taylor's narrative crystals center on her childhood growing up in a large church-going family with a loving, skilled, and devoted mother "Jo" and a hardworking father "Henry". In ***Big shots*** (six tellings), Ms. Taylor recounts with great pride that her mother was famous within her local community for being an excellent baker and was frequently hired to provide desserts for parties thrown by local "big shots". In some versions, she notes that she helped her mother by washing the pans. In ***Henry, you took my cook*** (twelve tellings), another story that relates to her mother's talents in the kitchen, Ms. Taylor remembers as a young child overhearing her maternal grandfather teasing his son-in-law, Henry, that when Henry and Jo were married, Henry had taken his cook away (even as a child, Jo had apparently been a better cook than her own mother). Some versions include Ms. Taylor's subsequently joking with her grandfather that he should solve the problem by moving in with her family, to which the grandfather replied "Grandma won't let me!"

In ***You can take me, but you won't get a single one of them*** (four tellings), listeners gain a glimpse into Ms. Taylor's mother's typical response to apparent comments by astonished passers-by when she is outside the home with all ten of

her children. Similarly, in *First bell's ringing* (nine tellings; the focus of the section "First bell's ringing" below), listeners enter a limited but vivid storyworld that evokes the busyness of a lively family home each Sunday morning when a responsible, church-going mother needs to ensure that all ten children are ready to go to church. *I don't care what church it is* (four tellings) provides important insight into Ms. Taylor's mother's philosophy about church from a later point in Ms. Taylor's life; in this recounted conversation, Ms. Taylor expresses concern about how to raise her own children within an interfaith home to which her mother responds that, as long as the children have an opportunity to go to *some* church, it does not matter which denomination it is. That Ms. Taylor reported using this same phrasing when giving advice to her own daughter years later – and continued to voice this tolerant view when asked about her own church-going practices within her assisted living residence – indicates the central importance of this particular narrative.

The remaining two narrative crystals relate to Ms. Taylor's health. In *They stuck a needle in my arm* (three tellings) listeners gain a vivid image from Ms. Taylor's childhood visit to the physician's office where she learned of her allergic reaction to tomatoes; given the lifelong nature of the food allergy, Ms. Taylor recounts this version in situations where food choices are the topic of conversation. The final narrative crystal, *They did not make me eat it* (eight tellings), is part of a larger narrative that recounts a dramatic bout Ms. Taylor had with food poisoning at her assisted living residence. Although sections of the multi-faceted story are highly variable (e.g., the ambulance trip to and subsequent stay at a local hospital; the diagnostic process; her return to her residence), this stable narrative crystal focuses in on Ms. Taylor rebuffing an attorney's recommendation that she sue her assisted living residence over the food poisoning incident, indicating a strong moral compass.

LangAge and Ms. Moreau

The first biographical interview with Ms. Moreau for the LangAge corpus was conducted in 2005 when she was 83 years old. From the outset, Ms. Moreau showed a lively interest in the project, even preparing a handwritten draft for the interview (this essay as well as other written texts are not considered in this study). To create an opportunity for a more spontaneous conversation, AG arranged a second meeting with Ms. Moreau, thereby initiating a series of get-togethers that developed into a friendly relationship with accompanying telephone calls and letters that continued until a few months before Ms. Moreau's death in 2014. In 2013, Ms. Moreau was diagnosed with dementia and subsequently moved from her home into a retirement home where she remained until her death. The recorded

interactions are filled with Ms. Moreau's vivid lifetime memories and evidence a keen historical awareness.

In what follows, we characterize the eight narrative crystals (hereafter marked in bold italics) we identified that appeared two or more times within and across the eight interviews held over nine years (April 2005, March 2007, September 2008, December 2009, March 2012, October 2012, November 2013, and October 2014).

The set of narrative crystals contains a variety of stories about Ms. Moreau's childhood in the countryside, within her large family (*Grandparents*, four tellings) and the universe of her parents' farm: a community of seven children; a number of employees and seasonal workers; and activity in the farm's various domains, including the center of advanced milk production (*Selling milk*, six tellings). Contemporary life with a special focus on her family's musical culture constitutes an important theme that is reflected in the Sunday ritual we analyze in this paper: no one was allowed to disturb Ms. Moreau's father when he was listening to his weekly radio concert (*Sunday concert*, eight tellings). As an eager and studious pupil Ms. Moreau, along with one of her sisters, was allowed to leave the farm to attend a boarding school where top-tier education was combined with military rigor (*Boarding school*, seven tellings). However, as the oldest of her siblings, Ms. Moreau reluctantly had to leave school at the age of thirteen to return to help on the family farm (*Milking in tears*, five tellings), never again having the opportunity for further education or training. During the German occupation, Ms. Moreau was forced to work in a German hospital (*Military nurse*, two tellings) and experienced bombing by the Allied Air Force (*WWII bombing*, five tellings). During this time, the historic troglodytic caves were transformed from agricultural utility rooms to hiding places (*Tufa caves*, six tellings). After the war, she got married, had two children, and helped her husband in his business.

When AG met her, Ms. Moreau was already widowed; her son lived abroad and her nearby daughter took care of her. Her 90th birthday brought with it a major change: Ms. Moreau put an end to her very active practice of engaging with the past in the form of essays, notes and photo albums (in her own words: "*that's over*"); she did, however, agree to another recorded interview (October 2012). In the following year, she moved to a retirement home, where AG visited her (November 2013). By then, her health was more fragile and she was diagnosed with dementia (this health information was provided by Ms. Moreau's daughter, with whom AG maintained regular contact). In the final recording of the series (October 2014), Ms. Moreau's dementia was particularly evident as she struggled with word-finding problems, used invented words, and provided anachronistic details; e.g., her father's radio of the 1930s "became" a television set in her narrative recounting of the *Sunday concert*.

The internal architecture of narrative crystals

In this section we each explore the phenomenon of “narrative crystal” by focusing on a *single* instance from each corpus that describes a Sunday routine in the families of Ms. Taylor and Ms. Moreau. Following a brief setting of the scene, we characterize the building blocks that make up the ensemble, highlighting those that we discerned to be crystallized cores. The verbal descriptions we provide of the habitual scenes are reconstructions of underlying experiences that draw on accumulated details from one or more tellings.

First bell’s ringing: Illustrative narrative crystal within the Carolinas Conversations Collection

The scene from Ms. Taylor’s childhood evoked by the narrative crystal *First bell’s ringing* is made up of the following seven blocks (indexed with Roman numerals) which are described in fuller detail below.

Ms. Taylor’s family went to a Lutheran church (I) each Sunday morning (II). Ms. Taylor’s mother would hear the first church bell ring (III) and would call out to her ten children (IV) “*All right children, first bell’s ringing, if you’re not ready, you’d better be gettin’ ready*” (V). Her children knew they had to be ready (VI) and they walked to church (VII).

Variations across the nine tellings have to do with whether the church’s denomination (Lutheran) was mentioned; whether the mother’s location and/or activity in the home was depicted; whether the effect on the children (“*we knew to be ready*”) was given; and what happened next (“*we went/walked to church*”).

As illustrated in Figure 1, each of the nine tellings of *First bell’s ringing* in this series includes minimally two⁶ and maximally five of these seven building blocks (i.e., not a single telling includes all seven building blocks, in contrast to AG’s data). Of these, only one (V) serves as the narrative’s crystallized core due both (1) to its presence in every telling; and (2) to its high degree of stability in terms of lexicon, grammar, and prosody.

In contrast to Ms. Moreau’s *Sunday concert* narrative crystal described below, these tellings by Ms. Taylor are very brief, ranging in length from 21 to 57 words

6. The fact that this narrative crystal can be made up of only two building blocks makes one ponder the existence of a narrative crystal comprising a single building block. Future investigations may indeed identify an explicit developmental connection between these very brief narrative crystals and the single-utterance ‘narrative traces’ identified and described in Hamilton (2008).

Conversational partner (pseudonym)	Month of conversation	BUILDING BLOCK I we went to (a Lutheran) church	BUILDING BLOCK II on a Sunday morning	BUILDING BLOCK III she'd hear the bell ringing	BUILDING BLOCK IV and (I'd hear her) she'd yell	BUILDING BLOCK V "all right children, (the) first bells ringing."	BUILDING BLOCK VI we knew to be ready	BUILDING BLOCK VII and we went
Ms. Arfield	Oct 2005							
Ms. Woolard	Oct 2005							
Ms. Goldman	Nov 2005							
Ms. Parton	Nov 2005							
Ms. Asmus I	Mar 2006							
Ms. Asmus 2	Mar 2006							
Ms. Bagley	Mar 2006							
Ms. Dorton	Apr 2006							
Ms. Pagett	Apr 2006							

Figure 1. Building blocks in Ms. Taylor's *First bells' ringing* narrative crystal ($n = 9$)

(mean 37.55 words). To give the reader a sense of the variation, Table 1 provides transcriptions of three tellings along this continuum.

Table 1. Three tellings (of 9) of Ms. Taylor’s *First bell’s ringing* narrative crystals

Telling 6 (21 words)	Telling 8 (37 words)	Telling 9 (57 words)
Yeah on Sunday morning	I can hear my mother on Sunday morning she would hear the bell and go to church	And I can hear her yell on Sunday mornings when the church we went to church we were taught to go to church and of course she went with us she and daddy both And uh I can hear her yet
All right children the first bell is ringing if you’re not ready you better be gettin ready	All right children first bell’s ringing if you’re not ready you better be gettin ready I can hear her yet	All right children the first bell’s ringing if you’re not ready you better be gettin ready

Building block I provides general orientation information that Ms. Taylor’s family went to a Lutheran church. It is present in four (1, 5, 8, 9) of the nine tellings.

Building block II provides specific temporal reference to the Sunday ritual. It is present in seven (1, 2, 3, 6, 7, 8, 9) of the nine tellings.

Building block III provides more specific orientation information regarding the ringing of the local church bell. It is present in four (4, 5, 7, 8) of the nine tellings.

Building block IV refers to the fact that Ms. Taylor could hear her mother yelling out to her children. It is a particularly important part of this narrative crystal, appearing in seven (1, 2, 4, 5, 7, 8, 9) of the nine tellings and being voiced twice in four (2, 5, 7, 8) of these tellings, for a total of 11 instances.

Building block V provides vivid details of Ms. Taylor’s mother by voicing what she said to her children in an instance of constructed dialogue (Tannen, 2007). It is present in all nine tellings; beyond this, it is remarkably stable in all ways, providing evidence that it is not only a building block, but the single crystallized core of this narrative crystal. Table 2 displays its stability related to lexical choice and grammar, with the minor exceptions in tellings 2 and 7 highlighted by bold-faced type.

Building block VI refers to the immediate effect of the mother’s verbal instructions to the children and is present in only two (1, 3) of the nine tellings.

Table 2. Lexical and grammatical stability of *First bell's ringing* building block V

(1) All right, children, the first bell's ringing, if you're not ready, you better be gettin' ready	(2) All right, children, I can hear it, first bell's ringing, if you're not ready you better be gettin' ready	(3) All right, children, the first bell's ringing, if you're not ready, you better be gettin' ready
(4) All right, children, the first bell's ringing, and if you're not ready, you better be gettin' ready	(5) All right, children, first bell's ringing, you're not ready, you better be gettin' ready	(6) All right, children, the first bell is ringing, if you're not ready, you better be gettin' ready
(7) All right, kids , first bell's ringing, if you're not ready, you better be gettin' ready	(8) All right, children, first bell's ringing, if you're not ready, you better be gettin' ready	(9) All right, children, the first bell's ringing, if you're not ready, you better be gettin' ready

Building block VII refers to secondary effect of the mother's verbal instructions, as the chain of actions represented in this scene is resolved: (1) mother hears the bell ringing; (2) she yells to the children to get ready; (3) the children get ready; (4) they walk to church. This building block is present in only three (2, 3, 5) of the nine tellings.

In sum, Ms. Taylor's narrative crystal *First bell's ringing* is made up of seven building blocks, one of which (the constructed dialogue of Ms. Taylor's mother in building block V) we identified as the single crystallized core based on its highly stable occurrence in all nine tellings. It is perhaps of consequence that four of the other six narrative crystals in Ms. Taylor's repertoire also have cores that convey memorable instances of remembered utterances – representing the voices of Ms. Taylor's mother, her grandfather, and her own.

Sunday concert: Illustrative narrative crystal within LangAge corpora

The first telling of *Sunday concert* in the LangAge series (April 2005) represents one way in which seven building blocks (indexed with Roman numerals) construct the scene that centers on Ms. Moreau's father, a key figure throughout the entire interview series.

Ms. Moreau presents her father as a musician (I) who every Sunday (II) listened to the radio, a device with lamps on top (III) from which the Concert Colonne (IV) was broadcast. As he sat astride his chair (V) his children were not allowed to disturb him (VI) because he was listening to his concert (VII).

Building block I connects “father” with “music”; it is present in all tellings. While there is some variation in the wording, the stable element of this building block is established prosodically: in seven of eight tellings, the block is realized with a rising contour (April 2005; September 2008; August 2011; March 2012, October 2012; November 2013; October 2014). In the remaining interview (March 2007), the block is somewhat displaced, coming at the end of an intonation phrase; there it is introduced with an epistemic causal connector: “*he was listening the / there were already these concerts / because he was musician*”, and the contour is falling. Despite this minor variation, we classified this block as a crystallized core, given its use in every telling and strong prosodic stability.

Building block II provides the temporal information related to the weekly Sunday ritual. This block is very short and very stable. Prosodically, it presents a flat continuation contour; lexically, there is nearly no variation: the concert takes place ‘*every Sunday*’ (fr. “*tous les dimanches*”, April 2005; March 2007; September 2008; August 2011; March 2012; November 2013) or ‘*on Sunday*’ (fr. “*le dimanche*”, April 2005; October 2012). In the first telling, it appears twice, repeated after the introduction of the radio. The only telling where this temporal information is not provided is in the final interview (October 2014).

Building block III references the family’s radio in all tellings except, again, the final interview. The central prepositional phrase regarding the radio ‘*with lamps on top*’ (fr. “*avec des lampes dessus*”) is repeated (April 2005; March 2007; September 2008; August 2011; March 2012). In October 2012, “*radio*” is pronounced only after a word retrieving problem (‘*you know the first sets of of radio back then*’) possibly also affecting the attribute ‘*with lamps (on top)*’ which is replaced by the deictic ‘*back then*’ (fr. “*à l’époque*”). In November 2013, Ms. Moreau simply confirms that her family had a radio, and as part of this confirmation erroneously uses the verb ‘*watch*’ instead of ‘*listen*’. One could suppose that the concept of radio was bleaching, as in the final recounting of this scene (October 2014), the radio is replaced by one of ‘*the first ramenés (?) of television*’. The possible participle “*ramené*” is pronounced unclearly and makes no obvious sense here. Despite this lexical problem, Ms. Moreau’s summation (‘*well ... we had a television at home*’) displays obvious pride in her family’s status as technological pioneers.

Building block IV provides the precise name of the weekly concert series, ‘*Concerts Colonne*’.⁷ We consider this proper noun to be a crystallized core due not only to its appearance in each of the eight tellings, but because of its prosodic sta-

7. The Concerts Colonne series was named after conductor Édouard Colonne (1838–1910), founder of the still active Colonne Orchestra http://www.orchestrecolonne.fr/images/Programme_Prokofiev_web.jpg.

bility, with clear accents on the second syllable of “concert” as well as on both syllables of “Colonne”, with just a slight pitch movement. In each telling, Ms. Moreau articulates the final schwa [ə].

Building block V brings the scene to life in six of the eight tellings with a prepositional phrase that helps the listener envision Ms. Moreau’s father sitting astride his chair. This prepositional phrase is part of one of two different idioms, ‘like on a horse on his chair’ (fr. “à cheval sur sa chaise”, April 2005) or a metaphorical expression etymologically linked to ‘fork’ (fr. “à califourchon sur sa chaise”, September 2008; August 2011; March 2012; November 2013; October 2014). In the final interview, she uses both expressions: the sequence “à cheval” is not completed but continued by “à califourchon”. In this instance, Ms. Moreau places emphasis not only on the final syllable, but also on the first and third, underscoring the importance of this building block.

Building block VI refers to the silent children in the room, among them Ms. Moreau. The varying constructions include impersonal forms, or pronouns in the first or even third person plural. These different formulations nevertheless share common characteristics, due to the lively staging with a clear pitch accent at the end of the intonation phrase. We consider this block to be a crystallized core given its appearance in all eight tellings, in addition to this strong pattern.

Building block VII refers to Ms. Moreau’s father’s action of listening to his concert. It appears in a very stable form in all tellings and is therefore identified as a crystallized core. The block always has a falling contour that is established in one telling with a repetition (March 2007) and in another one with laughter (October 2012).

In sum, Ms. Moreau’s narrative crystal *Sunday concert* is made up of seven building blocks, four of which are identified as crystallized cores due to their occurrence in all eight tellings along with their stability across instances. These cores (1) introduce and characterize Ms. Moreau’s beloved father who, despite being a farmer by profession, always made time for cultural activities by never missing the Sunday radio concert; (2) provide the proper name of the concert series which Ms. Moreau always accurately articulated and remembered even in the final interview when she referred to the radio as a television; (3) demonstrate the perspective of Ms. Moreau and her siblings in relation to their father’s Sunday routine; and (4) show Ms. Moreau’s father sitting on his chair, listening to his concert.

Narrative crystals as stepping stones: Exploring multiple narrative crystals within single conversations

In this section we move from our focus on the internal formal architecture of narrative crystals to illustrating how they may relate to their discourse surroundings. We situate our investigation within the integrated model of formulaic language proposed by Wray and Perkins (2000) as characterized in our introduction above, and aim with our analyses to fill in some of its lesser examined areas. Of clear relevance to our work is their attention to what they term the “two sides of the coin” (Wray & Perkins, 2000, p.17) in relation to the functions of formulaic language; i.e., that it fulfills communicative goals in social interaction while also reducing cognitive processing effort.

In preparation for our analyses, we isolated the sections of our recordings and associated transcripts that included the narrative crystals we identified and described in the section “Description of data collections and narrators”. We then analyzed these iteratively and with the assistance of synoptic visualization and repeated listening, supported by software PRAAT (Boersma, 2001). As we carried out our multi-level annotation, we found the following notions to be most important:

1. entrance and exit talk (Jefferson, 1978) that bridges the narrative to the preceding and subsequent interaction surrounding it;
2. narrative clause functions (abstract, orientation, complicating action, evaluation, resolution, and coda) as characterized by Labov (1972);
3. instances of narrative evaluation (e.g., intensifiers, modal verbs, negation; see Labov, 1972) that provide evidence for a speaker's purpose in telling a story;
4. instances of constructed dialogue (Tannen, 2007);
5. evidence of recipient design (Sacks et al., 1974) by the teller for her interlocutor;
6. evidence of self- and other-positioning among figures within the storyworld or between conversation partners in the local interaction (Bamberg, 1997);
7. prosodically salient passages that also occur in other versions of the same narrative; and
8. argumentative elements that either make a claim or provide evidence for one.

As will become clear in the sections “The use of stepping stones in transitions between discourse topics” and “Prosodic traits of stepping stones”, information from these tiers is relevant to varying degrees and more or less explicitly within each of our analyses.

We found in both data sets that narrative crystals functioned similarly as figurative stepping stones to help Ms. Taylor and Ms. Moreau manage the challenges

of their verbal interactions. Figure 2 displays our understanding that these retold narratives represent only one of a number of discursive phenomena that function in this way; additional phenomena identified in other empirical studies of conversational discourse of those with dementia (see Frankenberg et al., 2021; Hamilton, 2019) include retold jokes and repetitions of questions, sayings, and vocative address (all outside the scope of this article). Some, but not all, retold narratives fall into the category of “narrative crystal”; whereas individuals may repeatedly bring up the “same” life events (e.g., playing outside with neighborhood children; working in a furniture store) in their conversations, not all such recountings attain the “polished” durable nature of what we call “narrative crystals”.

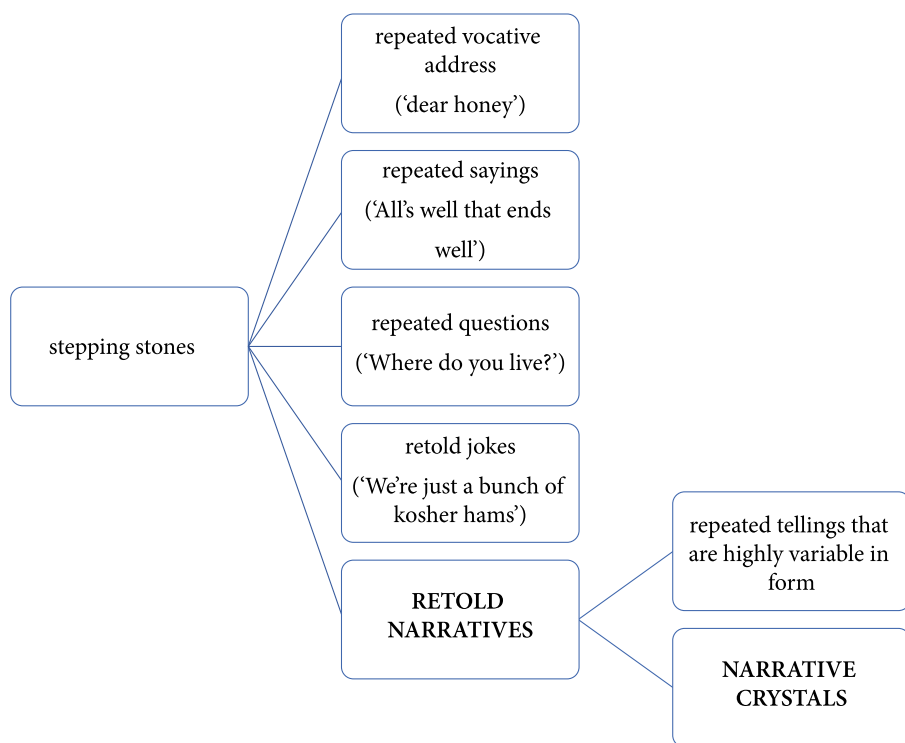


Figure 2. The placement of narrative crystals within the larger set of stepping stones

In what follows, we investigate two different aspects of this more general phenomenon. In the section “The use of stepping stones in transitions between discourse topics”, HH focuses on discursive bridges (cf. work by Jefferson, 1978 on “entrance” and “exit” talk) that connect the dyadic interaction of ongoing conversation to the (frequently abrupt) telling of very short, consolidated narratives that occur in the final 4:41 minutes of a 13:34 minute-long conversation between Ms.

Taylor and a visiting student, Ms. Bagley. In the section "Prosodic traits of stepping stones" AG examines the prosodic traits of stepping stones, by focusing on differences in pacing in Ms. Moreau's language use associated with the voicing of individual building blocks within the larger telling, hypothesizing that a quicker pace indicates a more formulaic – vs. creative – nature of the sequence (see Wray & Perkins, 2000; Hamilton, 2019, pp. 191–197).

The use of stepping stones in transitions between discourse topics

In this conversation between Ms. Taylor and one of her student visitors, Ms. Bagley, topics moved from talk about Ms. Taylor's childhood (e.g., Ms. Taylor's mother's excellent cooking; her large family comprising 8 brothers and 1 sister; neighborhood baseball games) to talk about the present (e.g., daughter and granddaughter; assisted living residence). Occasionally the visitor introduced a topic with an assertion ("*I know you...*") or a question ("*Was she a good cook?*") that "triggered" the telling of a narrative crystal; at other times Ms. Taylor "talked her way into" the narrative crystal herself.

In some instances, these discursive stepping stones appeared to assist in the navigation of the discourse topic; e.g., when Ms. Taylor introduced her own topic by way of a story or used her story to build upon another's topic. In other instances, they appeared to play a role in the structure of argumentation, when Ms. Taylor voiced a claim or provided evidence for such a claim. In still other situations, there was a jarring lack of any apparent discursive function, when a story seemed to come "out of the blue" and/or was missing discursive elements that might have served to build coherence across turns-at-talk.

The final minutes of the interaction under consideration included six tellings of four narrative crystals characterized in the section "Carolinas Conversations Collection and Ms. Taylor": (1) *I don't care which church*; (2) *You took my cook*; (3) *Big shots*; (4) second telling of *You took my cook*; (5) *First bell's ringing*; and (6) second telling of *I don't care which church*. The specific focus here is on the discursive bridging between two narrative crystals ("exit talk" from one story through the "entrance talk" to the next) rather than on the composition of a given narrative crystal (the focus of the section "First bell's ringing" above). Space constraints allow only brief examinations of two excerpts; in both, we see Ms. Taylor jumping by herself to the next stepping stone. Although from a production perspective these transitions appear to be accomplished relatively smoothly, in both cases Ms. Taylor introduces meaning-making difficulties for the interlocutor through unclear references to figures in the storyworld, as described below.

In Excerpt 1, of specific interest is Ms. Taylor's jarring launch in line 12 of her first telling of *You took my cook* ("*And my granddaddy was*") that contrasts starkly

with the discursive bridge that until then had been relatively seamlessly constructed by both interlocutors between the final lines of Ms. Taylor's first telling of *I don't care which church* in lines 1–2 and the mutually positive evaluation of Ms. Taylor's mother in lines 8–11. As part of this successful transition, Ms. Bagley had provided a positive evaluation of Ms. Taylor in lines 3–4 (*Well that's a good attitude to have. You have a very good attitude, Ms. Taylor*) as possible exit talk to her narrative, with Ms. Taylor following up with a clear link in lines 5 (*Well that's the way I was taught*) and 7 (*I had a good mother and daddy*) between her good family upbringing and her current attitude. Ms. Bagley had then moved in line 8 to focus specifically on Ms. Taylor's mother (*She was a sweet woman*), providing a link in lines 10–11 (*Oh it sounds like it; to put up with all you kids*) to one of Ms. Taylor's favorite conversational topics, being one of ten siblings in a very large loving family.

Excerpt 1. Transition from *I don't care which church it is* to *You took my cook*

1. Ms. Taylor: But uh I don't care which church it is
2. If they invite me to go I go
3. Visitor: Well that's a good attitude to have.
4. You have a very good attitude, Ms. Taylor.
5. Ms. Taylor: Well that's the way I was taught.
6. Visitor: Um hmm
7. Ms. Taylor: I had a good mother and daddy.
8. Visitor: She was a sweet woman.
9. Ms. Taylor: Indeed she was.
10. Visitor: **Oh it sounds like it**
11. **to put up with all you kids**
12. Ms. Taylor: **And my granddaddy was**
13. she was a Watkins from Lancaster County so
14. Visitor: uhhuh
15. Ms. Taylor: And my granddaddy told my daddy
16. "Henry when you took my cook
17. these other girls can't cook like you did!"
18. I said
19. "Now granddaddy, you oughtn't to say it like that
20. they cook too"
21. He says
22. "Well I'll think about it"
23. **Something like that**
24. Visitor: **What's your favorite thing to cook.**
25. Ms. Taylor: Well honey I'm not really anything special

26. Visitor: Oh really.

27. Ms. Taylor: Whatever the family liked I tried to fix it.

The out-of-the blue jump to the *You took my cook* stepping stone in line 12 – with its lack of clarity as to why “*granddaddy*” is being introduced within the ongoing topic of Ms. T’s mother – appears to have left Ms. Bagley with no clear conversational resources to use in response. Despite Ms. Taylor’s quick cohesive tie in line 13 (through the personal pronoun “*she*”) back to her mother, she continued to recount (in a less than coherent way than in other tellings) one of her favorite experiences involving her granddaddy, her father, and herself regarding her mother’s good cooking (lines 15–22) until its conclusion (“*something like that*”) in line 23. In this telling of the story, Ms. Taylor never made clear who her mother is in that story (“*my cook*”). Ms. Bagley’s apparent uncertainty regarding what she had just heard led then to an awkward bridge in line 24 (“*What’s your favorite thing to cook?*”) out of this narrative back into the ongoing conversation – and the new proposed topic of Ms. Taylor’s own cooking sputtered out.

Approximately a minute later in the same conversation (Excerpt 2), Ms. Taylor had returned to a second telling of *You took my cook*, concluding it by recounting the cherished conversation between her grandfather and herself (lines 62–63). Following the story’s resolution in line 65 (that her mother continued to cook “*something [her father] liked to eat*” even after she had married and left her cooking responsibilities within her childhood home), Ms. Bagley provided a general positive evaluation in line 66 of Ms. Taylor’s life based on that story (“*You were brought up just nice, weren’t you?*”), with which Ms. Taylor agreed (lines 67–68) and Ms. Bagley confirmed (line 69).

Excerpt 2. Transition from second telling of *You took my cook* to *First bell’s ringing*

62. Ms. Taylor: I said, “Well, Granddaddy, you’ll just have to come stay with us.”

63. And, he said, “Grandma won’t let me.”

64. He’d come though, but he didn’t stay.

65. Mother would always have something he liked to eat.

66. Visitor: Uhhuh. You were brought up just nice, weren’t you?

67. Ms. Taylor: Yes I was.

68. We sure were.

69. Visitor: Well that was good. That’s very good.

70. Ms. Taylor: And she could hear the church bell ringing from our house

71. and she’d say on Sunday morning.

72. she’d be out on the porch doing something and she’d

73. Visitor: Uhhuh

74. Ms. Taylor: "All right, kids, first bell's ringing.
 75. If you're not ready, you'd better be getting ready."
 76. Visitor: [Ya'll had heard her]
 77. Ms. Taylor: [That was the most-]
 78. Well we was mostly ready then.

Following this topic closure sequence (Schegloff & Sacks, 1973), Ms. Taylor jumped onto the next stepping stone by launching a new story (*First bell's ringing*) in line 70 ("And she could hear the church bell ringing from our house"). Similar to Excerpt 1 above, the introduction of a new scene appeared to present an abrupt meaning-making challenge to her conversational partner. When Ms. Taylor used a pronoun ("she") following the conjunction "and", Ms. Bagley needed to reach back mentally to figure out which female figure⁸ (perhaps in connection with *You took my cook*) mentioned previously was to play the central role in the upcoming narrative as well; once the person reference issue was solved, Ms. Bagley needed to discern the point of the larger scene being described. The mismatch in understandings is evidenced in the competing overlapping utterances in lines 76 and 77; whereas Ms. Taylor had stepped out of the storyworld to provide external evaluation (Labov, 1972) as to the point of the story ("That was the most..."), Ms. Bagley had restricted her commentary to the local sequencing of events in the narrative (that the children had all heard their mother). Ms. Taylor's response in line 78 ("Well we was mostly ready then") to her conversational partner's attempt indicates that her story had not been interpreted as she had intended.

Having considered how a series of different narrative crystals appeared to function as stepping stones that eased a dyadic interaction for Ms. Taylor while simultaneously contributing to meaning-making challenges for her conversational partner, we turn now to AG's prosodic-phonetic analysis of smaller relatively crystallized sequences that appeared to serve as stepping stones within the challenging opening stage of a new interaction.

Prosodic traits of stepping stones: The role of articulation rate

The final life story interview in the series with Ms. Moreau (by this point she had been diagnosed with dementia) started off rather tentatively. Conducted in the retirement home where she had been living for a little more than a year, Ms. Moreau seemed somewhat uncomfortable when asked about her current situa-

8. As noted in the section "First bell's ringing", we know from other tellings of *First bell's ringing* that "she" refers to Ms. Taylor's mother.

tion; in contrast, she literally picked up speed as she moved onto the "stepping stones" of conversation about times in her past.

In what follows, we validate this subjective impression on the basis of a prosodic-phonetic analysis of articulation rate, which previous studies have identified as an indicator of the following phenomena: (1) aging (Jacewicz et al., 2009; Quené, 2008, in relation to phrase length; Kreiman & Sidtis, 2011:121); (2) a speaker's level of comfort vs. discomfort (Mehrabian, 1971); and, perhaps most relevant to our analysis, (3) a speaker's "habit strength" as conceptualized by Goldman-Eisler (1961). In her series of phonetic experiments pertaining to the relationship between speaking and thinking, Goldman-Eisler (1961) found that, although a given speaker's articulation rate varied only slightly when carrying out tasks with different degrees of abstraction, this rate increased significantly with repetition. In her view, this points to an influence of what she calls "habit strength": "In other words, an increase in speed of articulation thus indicates an increase in the use of prepared and well learned sequences, of cut and dried phrases and clichés, of trite and vernacular speech, of commonplace utterances of professional jargon" (Goldman-Eisler, 1961, p. 174). This finding was corroborated later in naturally-occurring interactions in Hamilton's (1994: 67) longitudinal case study of Elsie, an individual with Alzheimer's disease, whose speech exhibited greater fluency and appeared to be produced "more automatically" when "related to [her] past experiences."

The following analysis focuses on the first portion of the interview (14 minutes 26 seconds) that contains several shifts in both topic and manner of speaking; thereafter, when Ms. Moreau sticks to topics of the past, the flow of speech is steadier.

In preparation for the analysis, we divided this discourse excerpt into sections according to four types of reference to time along the life course: (1) "now" for sections that focused on Ms. Moreau's current situation; (2) "then" for sections where Ms. Moreau spoke about her past; (3) "now+then" for sections in which Ms. Moreau evaluated past events with regard to her current situation and from her current point of view; and (4) sections that contain a "narrative crystal" as identified in the section "LangAge and Ms. Moreau" above.

The resulting total of fifteen sections within this portion of the interview comprises five dealing with the past ("then"); five comparing the past to the present ("now+then"); three dealing with the present ("now"); and two tellings of narrative crystals ("C"). The numerals 1–15 indexing these sections are introduced in the characterization below and noted in the graphic representation of the prosodic-phonetic analysis in Figure 3.

In the first "now" section (1), Ms. Moreau answered a question regarding her well-being in the retirement home. After affirming that she was comfortable with

the service, she surprisingly stated “*I’m used to it*” and elaborated in section (2) on the comparison between the nursing home where she was currently living and the boarding school she attended as a young girl (“now+then” section). The next section (3) was identified as “crystal” (*Boarding school*), a telling of her experience at the boarding school she introduced with “*in contrast, we weren’t allowed to speak at boarding school*”. After the comment “*this was not always easy*” marking with the deictic “*this*” her present point of view, the following section was labelled as “now+then” (4). She then explained the “then” in greater detail (5), introducing the section with “*because ...*” and providing further evidence from past events for her statement of having gone through tough times. With the marker “*so*” followed by “*hein*” in tag position, she returned to her present point of view (“now+then”, 6). In the next section, she provided additional historical details regarding her parents and grandparents (7, “then”) and reflected on her family’s values: “*so, my goodness, I consider ...*” (8, “now+then”). The following section (9, “now”) stepped back into the present: “*voilà, so*” and continued with a self-directed question as to how to continue (“*voilà, so, what can I ...*”), upon which Ms. Moreau elaborated on her life in the retirement home, stating again that she was “*used to it*”: “*I am in the boarding school, as an old person*”. When AG asked about Ms. Moreau’s father’s musical activities, she developed this topic (10, “then”), with the exception of a short interruption when she was asked about her own interest in listening to the radio: she talked about her current situation (11, “now”) and again about the past, answering AG’s question (12, “then”). In the following section, she compared “*by contrast*” her own large family situation with others who came from rural backgrounds from today’s point of view (13, “now+then”). These observations regarding her family’s cultural interests led to AG’s question about the radio concerts, to which Ms. Moreau responded by telling the *Sunday concert* crystal (14, “crystal”). The marker “*so*” initiated the final section containing details as to how her father taught his children about individual musical instruments (15, “then”).

Within these fifteen sections we assessed the articulation rate as measured in syllables per second.⁹ Figure 3 shows the fifteen sections distinguished according

9. In each section we labeled the spoken parts or “interpausal units” (IPU) with a minimum pausal length of 100 ms in PRAAT. IPU were annotated for the number of phonetically realized syllables by two expert annotators. Monosyllabic units, overlapping speech, and questions from the interviewer had different labels and were not taken into consideration in this analysis; only IPU with Ms. Moreau speaking were included. The net speaking time of Ms. Moreau is 10:30 min found in $n=339$ IPU. The individual sections differ in length and in number of IPU (Crystal: 0:55 min, IPU $n=28$; now+then: 4:20 min, IPU $n=153$; now: 1:44 min, IPU $n=64$; then: 3:11 min, IPU $n=94$). Based on the PRAAT-output, the quotient of number of syllables per second in the IPU, i.e. the articulation rate, was determined and compared across individual sections. Statistics and plots were done in R with the packages *dplyr* (Wickham et al., 2021),

to the four labels. Higher articulation rates are represented by the position of the box. The boxes indicate the second and third quartile of articulation rate per section, with the median marked as black bar; the mean of each section is represented by the position of the individual number 1–15.

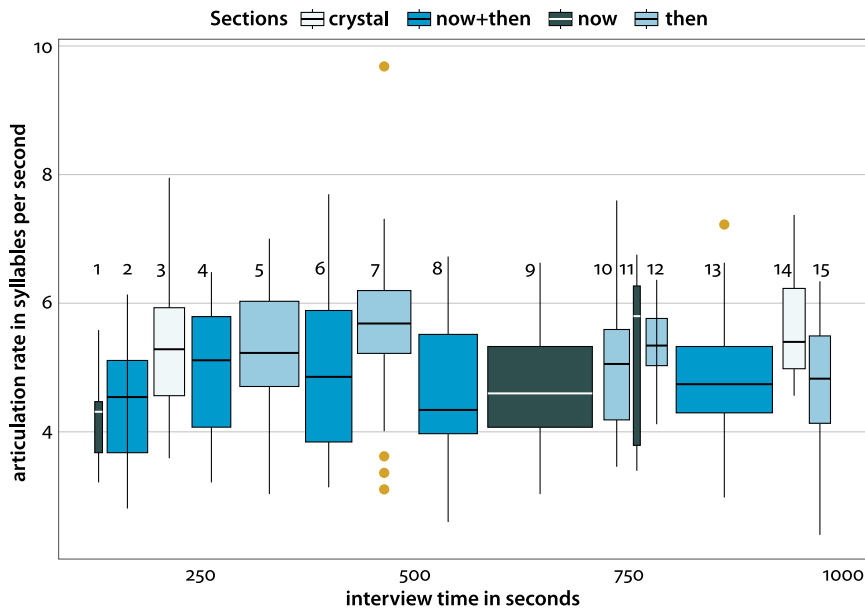


Figure 3. Ms. Moreau’s articulation rate in the opening of October 2014 according to 15 sections

The statistical and graphic analysis confirm the auditory impression that Ms. Moreau’s speech changed when she shifted from tentative talk about “now” to the stepping stones of past experience. Moving from the first to the second, and from the second to the third section, Ms. Moreau’s articulation rate increased. This pattern of slower pace for “now”/“now+then” sections as compared to “then”+“crystal” sections was repeated across the remaining sections. The brief intrusion of section 11 (“now”) is only an apparent counter-example if we take into account Mehrabian’s (1971, p. 72) finding that low levels of discomfort may be reflected in higher articulation rates.

Differences in articulation rate between the two groups of present (“now”, “now+then”) vs. past (“then”, “crystal”) sections were found to be statistically sig-

nificant,¹⁰ with “then” sections (5, 7, 10, 12, 15) containing generally faster articulation rates than the “now+then” sections (2, 4, 6, 8, 13) and the “now” sections (1, 9, 11) which contained the lowest values for articulation rates. In support of Quené (2008), we found a significant positive correlation between phrase length and articulation rate.¹¹

The two crystals (*Boarding school* and *Sunday concert*; sections 3, 14) whose tellings happened to occur in the portion of text under examination provide strong evidence of our assumption that faster speech rate is associated with the ease of accessing and performing a narrative crystal. Based on the characterization of the narrative crystals’ internal architecture presented in the section “Sunday concert” above, we know that these units were frequently repeated and in this way may have acquired the properties of a reliable, available resource in interaction. In Goldman-Eisler’s (1961, p.174) terms, they exhibit the “habit strength” of “well learned sequences” in contrast to “creative activity”. Hamilton (1994, p.167) underscores the perception of greater fluency in utterances performed with a certain degree of automaticity (even when they are not semantically connected to the surrounding discourse). As our analysis suggests, articulation rate (together with phrase length) could be considered an indicator of fluency which is preserved when Ms. Moreau literally moves more quickly across the stepping stones of past experience, while being challenged by discussions of her relatively unknown current environment (the retirement home). By contributing to the perception of greater fluency, narrative crystals can be viewed as a successfully used resource.

Looking toward the future, since articulation rate is an indicator of the impact of aging, as well as of comfort level and “habit strength”, its increase encourages further study of the potentially protective power of resources such as narrative crystals that are acquired and kept available through (supposed) lifelong practice.¹²

10. The overall difference of articulation rate between the sections was found to be significant at a level of $p < 0.001$ for: ‘now’ vs. ‘then’ and ‘now+then’ vs. ‘then’; by contrast, the smaller differences between ‘now’ vs. ‘now+then’ and ‘crystal’ vs. ‘past’ did not turn out to be significant (Wilcoxon rank sum test with continuity correction).

11. Spearman’s rank correlation $\rho = 0.35$ with $p < 0.001$. We measured phrase length in syllables per IPU.

12. For further discussion of lifelong learning and the effects on lexical knowledge, see Ramsar et al. (2014).

Conclusion and implications: Why should we care about narrative crystals?

Energized by seminal scholarship within the areas of narrative studies, sociocultural approaches to aging and dementia, and formulaic language, we carried out our multifaceted examination of frequently told stories that emerged within two different longitudinal collections of verbal interactions involving two women in their 80s (one US American; one French) and their conversation partners. In this paper, we have (1) described the discovery process that led to our identification of a narrative type, "narrative crystals", that, to our knowledge, has not been previously discussed in the scholarly literature; (2) characterized the crystal's internal architecture as an ensemble of highly durable crystallized cores surrounded by sets of more flexible building blocks, based on single crystals from each corpus; and (3) illuminated ways in which narrative crystals function within their larger discourse surroundings, with HH exploring ways in which individual tightly consolidated narrative crystals can be seen as figurative stepping stones that provide a "safe space" as the speaker navigates ongoing interaction; and AG investigating an observed increase of articulation rate that may indicate relative ease associated with tellings of narrative crystals.

We see our work contributing to narrative studies in that this new narrative type draws on and is connected to major narrative types already known, but is not sufficiently characterized by any one of them. Some especially vivid narrative crystals relate closely to Tannen's (2008) notion of narrative "scene" (where a few utterances can evoke an entire scene) but frequently extend beyond painting a backdrop to providing a plotline. Others share characteristics with small stories (Bamberg & Georgakopoulou, 2008) in their brevity and hints at more expansive underlying narratives, but differ in that repeated tellings indicate greater durability than the typical fleeting nature of small stories. Still others are connected in clear ways to canonical Labovian personal experience narratives that include (at least minimal) evidence of component clause types (abstract, orientation, complicating action, evaluation, resolution, and coda), but are typically habitual (rather than one-time happenings) that illustrate life's routines rather than recount a highly reportable break in expectation. And, finally, the finding in the section "First bell's ringing" that one narrative crystal telling comprised only two building blocks makes one ponder the existence of an explicit developmental trajectory between these very briefest of narrative crystals and the single-utterance "narrative traces" identified and described in Hamilton (2008). Both corpora provide clear evidence of the importance of the visual (scenes) and acoustic (prosodic contours and melody) within narrative crystals and demonstrate in a new way Chafe's (1998) point that linguistic expressions used by narrators may indeed echo

only very small portions of the vast expanse that underlies narrative discourse. These findings argue forcefully for continued study of collections of narratives that recount the “same” experiences and/or scenes across the lifespan.

Beyond our contributions to narrative studies more generally, we understand our work on the narrative crystal to provide partial responses to test the robustness of claims related (1) to the integrated model of formulaic sequences by Wray & Perkins (2000, p. 24) and (2) to the characterization of prosodic-phonetic parameters of anchor points in retold stories by Barth-Weingarten et al. (2012, p. 348). In both cases, our findings based on our two different longitudinal data sets have validated this previous work and have extended it in important ways. Together our analyses suggest the possibility of a developmental shift in older individuals’ narratives away from moment-to-moment creative identity construction within interactional settings with particular conversation partners toward a highly formulaic text type that, while having its birth in individual life circumstances, has come to “stand in” in a more general way for a core value or feeling. In the specific narratives we examined in this article, these core elements appear to be deeply tied to the affection felt for important family members and their values.

In closing, we envision a bright future for continued research on both synchronic and diachronic levels at the intersection of narrative studies, formulaic language, and dementia discourse. Clear next steps on the synchronic level include (1) examining the degree to which individuals adjust aspects of their narrative crystal tellings in consideration of momentary interlocutor needs; and (2) comparing ways in which individuals recount narrative crystals that relate personal experiences to the ways in which the same individuals incorporate other kinds of stepping stones within their discourse – especially in relation to prosodic and phonetic details of oft-repeated songs, poems, and jokes within a speech community’s repertoire. Exciting and important research on the diachronic level into changes in the use of formulaic language as these relate to healthy aging and to advancing dementia may include (1) tracking shifts over time within the narrative crystal ensemble in terms of length, complexity, number of crystallized cores, song-like quality, and degree of variation within each building block; and (2) tracing developments in how a teller uses narrative crystals to make meaning, build an argument, and/or as “safe” spaces in ongoing interaction.

These studies may illuminate individual cognitive processes, as the lifelong practice of storytelling preserves linguistic resources and keeps them available for use. Related insights may lead to improved communication between older adults and persons with dementia and those who care for them, as frustration sparked by frequently told stories may be reduced by an understanding of the protective effects of retelling. Ultimately, a model that integrates both synchronic and diachronic evidence regarding how speakers use language to recount life experi-

ences across their life span – up to and including advanced stages of dementia – may have the best chance of meeting the challenge we articulated in the introduction to this paper: how to walk the scholarly tightrope between describing narratives that contain communicative anomalies as evidence of cognitive deficit or as offering life-affirming discursive glimmers of the speaker's identity. We are hopeful that our first foray into a deeper understanding of the forms and functions of narrative crystals has moved us toward a rebalancing of this delicate equilibrium.

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Appendix


Original French version of ‘Sunday concert’ preceding the “Introduction”:

*le dimanche je me souviens toujours il y avait des
on avait des postes à radio avec des lampes dessus
vous savez c'étaient les premières euh les premiers postes
et tous les dimanches après-midi
il y avait les Concerts Colonne
dans ce moment-là ça s'appelait comme ça
de à Paris qui donnaient une retransmission d' un conce() d'un concert
alors mon père
je le vois encore se mettre à cheval sur sa chaise
et il fallait pas le déranger
il écoutait son concert*

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