‘A thing not beginning and not ending’: using digital tools to distant-read Gertrude Stein’s *The Making of Americans*

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Abstract

The particular reading difficulties engendered by the complicated patterns of repetition in *The Making of Americans* by Gertrude Stein make it almost impossible to read this text in a traditional, linear manner. However, by visualizing certain patterns and looking at the text ‘from a distance’ through textual analytics and visualizations, we are enabled to make readings that were formerly inhibited. Initial analysis on *Making* within the MONK (metadata offer new knowledge) project (http://www.monkproject.org/) has yielded evidence which suggests that the text is intricately and purposefully structured. Using text mining to retrieve repetitive patterns and treating each as a single object makes it possible to visualize and compare the three dimensions upon which these repetitions co-occur—by length, frequency, and location—in a single view. Certainly, reading The *Making of Americans* in a traditional way appears to have yielded limited material for scholarly work, but reading the text differently, as an object of pairings or as parts of combinations, ultimately works in contrast to the supposition that the text is only meaningful to the extent that it defeats making meaning. A distant view of the text’s structure allows us to read the text as an object that becomes, as it continues to turn in on itself with a centrifugal force, a whole history without beginning or ending.

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> I always say that you cannot tell what a picture really is or what an object really is until you dust it every day and you cannot tell what a book is until you type it or proof-read it. It then does something to you that only reading never can do.
>
> Gertrude Stein, *The Autobiography of Alice B. Toklas*, 113

The particular reading difficulties engendered by the complicated patterns of repetition in *The Making of Americans* mirror those a reader might face attempting to read a large collection of like texts at once without getting lost—likewise, it is almost impossible to read this text in a traditional, linear manner. However, by visualizing certain patterns and looking at the text ‘from a distance’ through textual analytics and visualizations, we are enabled to make readings that were formerly inhibited. Franco Moretti has argued that the solution to truly incorporating a more global perspective in our critical literary practices is not to read more of the vast amounts of literature available to us, but to read it differently by employing ‘distant reading’. ‘We know how to read texts’, he writes, ‘now let’s learn how *not* to read them’ (Moretti, 2000, p. 57). Similarly, by learning

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to read texts that have been *mis*read 'at a distance', we are reading differently and we value different readings.

1 *Misreading The Making of Americans*

Although lauded by a handful of critics who thought Stein accomplished what Ezra Pound demanded of all Modernist writers (to make art, literature, and language 'new'), *The Making of Americans* (1925) was criticized by most of its early twentieth century readers who claimed the text was unreadable, that its author wrote 'a disaster' by creating 'tireless and inert repetitiveness which becomes as stupefying as it is unintelligible', and that it 'amounts in the end to linguistic murder' (Aiken, 1934, p. 39). In the twenty-first century, critics still bemoan the novel as 'monumentally tedious', with one critic arguing that *Making* proves Stein 'is really a terrible novelist with not the vaguest sense of what constitutes a novel' (Levitt, 2001, p. 505). Some critics have concluded that the text goes unread because it is inchoate—the early work of an inexperienced author—and as such its constant repetition represents a style of writing that is chaotic, unsystematic, and virtually impossible to read.[1] Even so, an appreciation of the text does surface among postmodernist critics who argue that the text represents a postmodern exercise in incomprehensibility that in itself poses a comment on the modernist desire for identity and truth.[2] According to this argument, the confusion *Making* elicits is a challenge to readerly subjectivity by evoking indeterminacy and deconstructing the role language and writing plays in determining identity. To be sure, understanding *The Making of Americans* in terms of this perspective, whether it is a focus on issues of race, class, gender, and sex, or the very complexity with which all these factors combine in each of us, is to focus on the importance of the form Stein uses to express that drive to construct identity. Whether repetition functions much like frames in a movie reel in which 'each picture is just infinitesimally different from the one before' (Wald, 1995, p. 295) or whether repetition identifies agency 'figured as an effect of grammar' (Taylor, 2003, p. 27), the repetitive form, critics argue, renders the reader's usual processes of making meaning useless and emphasizes the fact that 'Sense-making is a fundamentally cultural activity' (Wald, 1995, p. 297).

Clearly, reading *The Making of Americans* is difficult work. Even the text's narrator warns the reader that this tome 'is not just an ordinary kind of novel with a plot and conversations to amuse you' (¶162).[3] 'I have created a lot of characters [in *Making*]', she says elsewhere, 'but that is another story' (Stein, 1971, p. 507). Stein clarifies these assertions by comparing *The Making of Americans* to James Joyce's *Ulysse*s and Marcel Proust's *À la Recherche du Temps Perdu* to the extent that these novels also foreground the process of meaning-making rather than meaning itself. This is a difference that becomes salient when discussing a book Stein claims she meant 'to be the history of a family', but which became the history of history-making itself or 'a history of all human beings, all who ever were or are or could be living' (Stein, 1933, p. 56). If what Stein means by this comparison is that what the characters do and say is no longer significant without a consideration for the composition of the text, then critics are correct in one sense: the style of *The Making of Americans* does generate meaning. Repetition plays a profound role (there are 517,207 total words and only 5,329 unique words); more abstract and indeterminate verbs such as forms of 'to be' predominate ('he was' occurs 4,219 times and 'to be' 3,830 times); and personal pronouns proliferate in an inordinate degree over proper names—all of which serves to disambiguate human categorization more than it serves to categorize, ontologize, diagram, or type it. As such, *The Making of Americans* does confront readers directly with the failings of representation and the creative possibilities of alternative uses of language. On the other hand, it may be argued that incomprehension was not the goal of the text. 'Repeating is the whole of living', the narrator writes in the first chapter, 'and by repeating comes understanding, and understanding is to some the most important part of living (¶846)'. As such, a question arises that has not been adequately addressed: is the confusion the repetition engenders

a byproduct of reading meant to deconstruct processes of identity construction by making meaning through methods that ultimately elude meaning-making? Or, alternatively, is the confusion the repetition engenders the result of a *mis*reading and simply a byproduct of our inability to read the text?

2 *Distant-Reading The Making of Americans*

Initial analysis on *The Making of Americans* within the MONK project[4] has yielded evidence that suggests that the text is intricately and purposefully structured. For example, using the *Data to Knowledge* (*D2K*) application environment for data mining[5] has generated data that reflects co-occurring frequent patterns based on paragraphs made up of *n*-grams.[6] In the D2K analysis, establishing co-occurring patterns in *The Making of Americans* is a function of moving a window over trigrams (a three-word series), one word at a time, until each paragraph has been analyzed.[7] Looking at *n*-grams in particular allows for an element of 'fuzzy matching' that is quite productive when looking at repetition with variation because it facilitates searching for like patterns that are not exact duplicates. First, each sentence is parsed such that a sentence like, 'This is now a description of all of them' is broken into seven trigrams: 'This is now', 'is now a', 'now a description', 'a description of', 'description of all', 'of all of', 'all of them'. Executing the frequent pattern analysis algorithm on these trigrams in *The Making of Americans* yields a result in which subsets of trigrams are produced such as these four: 'a description of', 'now a description', 'this is now', and 'is now a' which co-occur in three different sentences in three different paragraphs (see Fig. 1).

Executing the frequent pattern analysis algorithm on longer *n*-grams also produces matches of greater length. For instance, an analysis executed on 36-grams produces a subset of co-occurring patterns that enabled the discovery of two, multi-paragraph sections of approximately 500 words. This discovery presents an unusual pattern in the text since these sections share—verbatim—the same 495 words (¶1726–7 and ¶1823–4). The same discovery would have been difficult with a string search since to search for these sections would depend on pre-knowledge that they exist—a nontrivial feat in the midst of the more pervasive and shorter repetitions that make up each section. The loss and the subsequent discovery of these paragraphs, however, serves to pique interest not only in the presence of larger patterns that move across—rather than within or between—the chaos of the more frequent repetitions, but also in whatever else readers may have missed with close reading.

Paragraph	Sentence
¶1076	This is now a description of such feeling.
¶1080	This is now a description of my feeling.
¶1081	This is now a description of all of them.

Fig. 1 Finding three similar sentences in *Making* with the D2K frequent pattern analysis algorithm

One such 'missed' pattern is discoverable through a tool called *FeatureLens*, which we designed within the MONK project to visualize the text patterns provided by the D2K application.[8] *FeatureLens* lists the text patterns provided by D2K according to their length and frequency (see Fig. 2, area 'A') and provides a visualization of the text's nine chapters at the chapter level and at the paragraph level (Fig. 2, 'C').[9] These two levels of granularity allow the user to identify meaningful trends within patterns across the text. It also enables the analysis of the different contexts in which those patterns occur (Fig. 2, 'D'). For instance, if we visualize ten of the top twenty most frequently co-occurring patterns in the text,[10] such as 'living', 'feeling', 'beginning', 'as I was|I was saying', 'men and women', 'children', 'history', 'one of them', 'kind of them', and 'being in them', (Fig. 2, 'B') we are presented with a seemingly chaotic pattern of repeated phrases that appear very frequently across the text (Fig. 2, 'C').

This 'muddle' of data pictured across the nine chapters in area 'C' is unsurprising considering that the narrator's goal is to describe the complete history of the three Hersland children (David, Alfred, and Martha) by describing their kind of being, including their living and feeling, how they repeat each other's behaviors and actions,

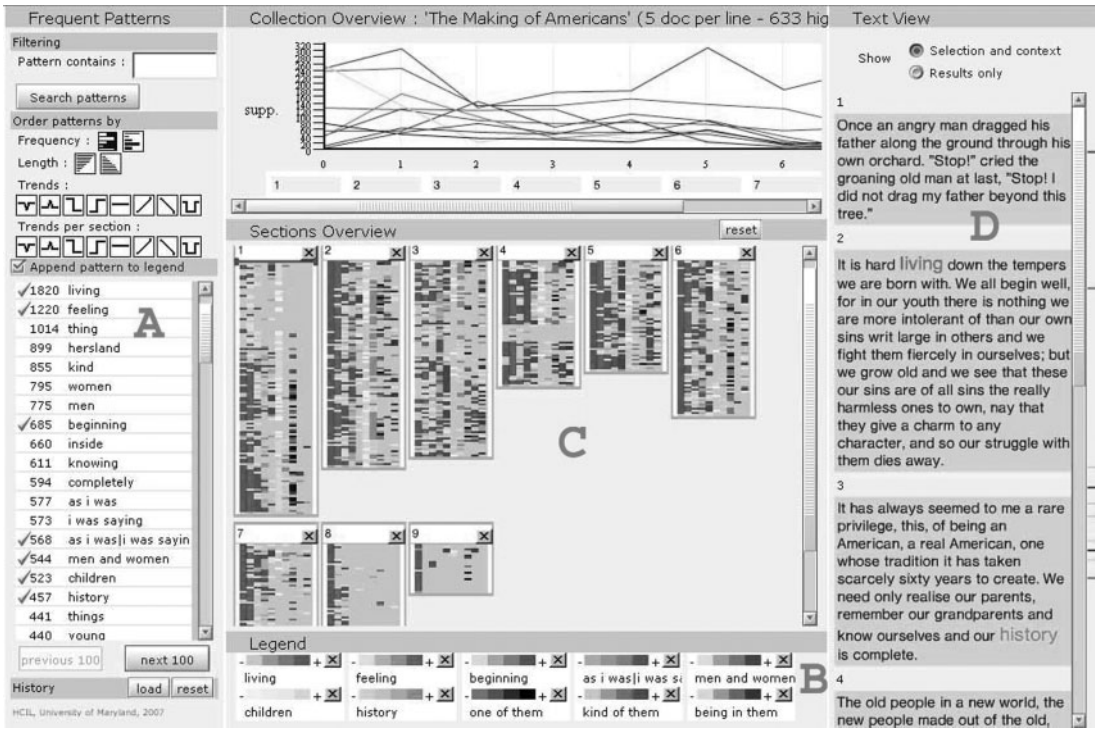

Fig. 2 Chapters 1–9, *FeatureLens*.[11] (Colour image available as supplementary data in *Literary and Linguistic Computing* online.)

and how they repeat the actions and behaviors of those around them. On closer inspection, however, we begin to see a larger structural pattern within the first chapter that is repeated throughout the first half of the novel. Namely, gaps appear within the most frequently occurring patterns (see 1, 2, and 3 in Fig. 3). The gap marked '3' in Fig. 3 would be familiar to most critics: the context proves it is the 'Hodder' or Redfern episode in chapter 4. The 'Hodder Episode' is so-named and considered significant because this short narrative mirrors an incident that occurred in Stein's circle of friends (between Mary Gwinn and Alfred Hodder) which Stein also fictionalizes in *Q.E.D*, a novel that Stein was unable to publish in her life time, because—most critics contend—it portrays a lesbian affair. The episode as it is written in *The Making of Americans* features two women in an ambiguous relationship, one of whom (Cora Dounor) has an affair with Martha Hersland's husband Phillip Redfern (who supposedly represents Alfred Hodder's fictional counterpart). The biographical component added with the contention that this story marks 'the longest sustained narrative in the plot' makes this episode 'a key for the overall project' (Wald, 1995, p. 286) for many critics.[13] By generating a list of peak data points, however, we see that there are other narratives. For example, sorting the list by trends such as co-occurring patterns that 'spike' or increase in frequency suddenly across a shorter distribution of data points[14] yields 7,000 results that comprise words and phrases—such as 'repeating', 'a whole one', and 'a history of'—which the narrator uses intermittently to remark on the process of creating her history. Clustered within the top twenty-five results of this new sorting, however, another thematic trend appears. Proper names such as 'Mabel', 'Madeleine', 'Wyman', and 'Linker' appear alongside 'Redfern' (the character who appears most often in the Hodder Episode gap). It is not surprising that the names appear as

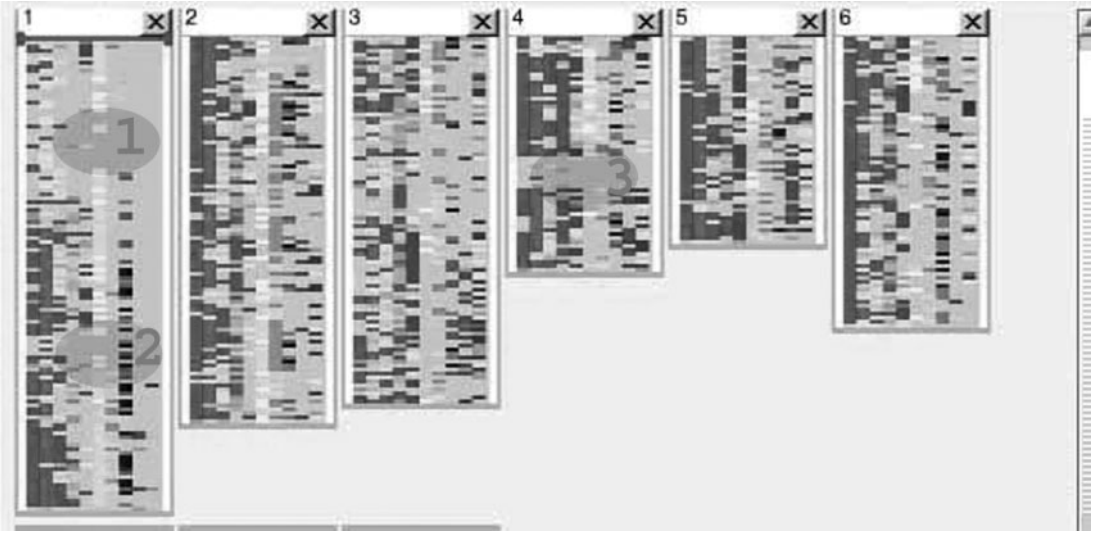

Fig. 3 Narrative gaps, chapters 1–6, *FeatureLens*.[12] (Colour image available as supplementary data in *Literary and Linguistic Computing* online.)

trends that peak within the text since the text is spotted with short narratives starring these characters, but it is illuminating that visualizing these trends makes clear the extent to which the Hodder episode is unexceptional. To illustrate this pattern, the following visualization plots these character names against the pervasive 'children' pattern identified previously (Figs 2 and 3). Below, in Fig. 4 and Fig. 5, 'children' is represented in the left-most column (in red in the supplementary data, available in *Literary and Linguistic Computing* online).[15]

The pattern of intermittent, short narratives that feature central character becomes clear when it is seen as gaps within the pervasive 'children' pattern: in chapter 1: 'julia' and 'shilling' appear; in chapter 2: 'mabel' and 'lillian'; in chapter 3: 'I' [the narrator]; in chapter 4: 'redfern'; and in chapter 5: 'arragon'. A coherent pattern emerges in which the repetitive, abstract, and generalized discussions of the 'Three Hersland Children' alternate between narratives about related characters. What is also clear is that one narrative (the Hodder episode) is not a key that will open the text's meaning—as if meaning resided in a buried treasure chest or behind a locked door. Truly, a lock 'key' is an ill-used metaphor that has led to misreading this text since no one point of entry appears to serve how the text may be read as a whole.

Perhaps a more useful metaphor for reading *The Making of Americans* is one that connotes a guideline for reading the direction, distance, and topography of a geographical location—a map key. Appropriately, a map key or legend allows the reader to understand what is being represented and the scale by which these items are being represented in relationship to each other as they progress across the geography of the text. Before we read the legend, however, we orient ourselves to the map.

3 Distant Reading *The Making of Americans*

The Making of Americans is divided into five main sections that comprise nine chapters.[16] The chapters are untitled but Stein (with Alice B. Toklas) proofread the typescript (Gallup, 1973, p. 214) and inserted title pages between groupings of chapters creating one untitled and four titled sections. The first section is untitled (chapters 1 and 2) and the second is titled 'Martha Hersland' (chapters 3 and 4); the third is 'Alfred Hersland and Julia Dehning' (chapters 5 and 6); finally, 'David Hersland' (chapters 7 and 8) and 'History of a

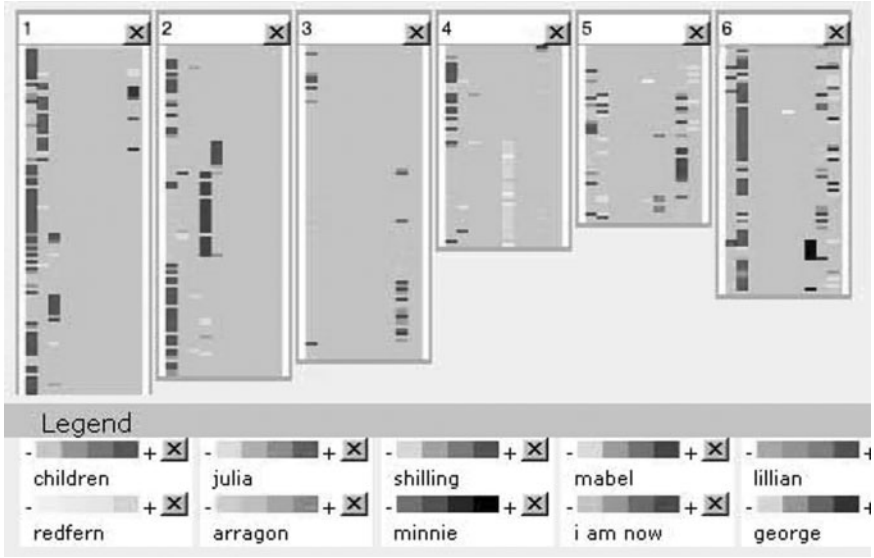

Fig. 4 Narrative gaps filled, chapters 1–6, *FeatureLens*. (Colour image available as supplementary data in *Literary and Linguistic Computing* online.)

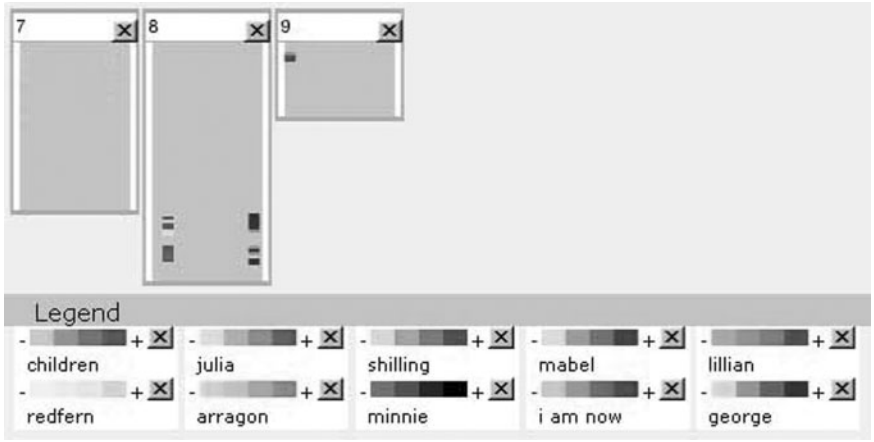

Fig. 5 Narrative gaps filled, chapters 7–9, *FeatureLens*. (Colour image available as supplementary data in *Literary and Linguistic Computing* online.)

Family's Progress' (chapter 9) comprise the fourth and fifth sections.[17] The following scatter plot serves as a map of the repetitions across the text according to their length and location where location is the starting point of the repetition as it is expressed in a running count starting with number 1000016.[18] The *x*-axis plots these locations across all nine chapters and the *y*-axis plots the length of each repeated string (including both words and punctuation) from 3 to 197 tokens. Each colored column of plotted dots represents one of the nine chapters. The black horizontal lines connecting the dots on the plot are lines indicating matching patterns.

The visualization that appears in Fig. 6 shows a trend for longer repetitions in the first half of the text with the longest repetition happening exactly in

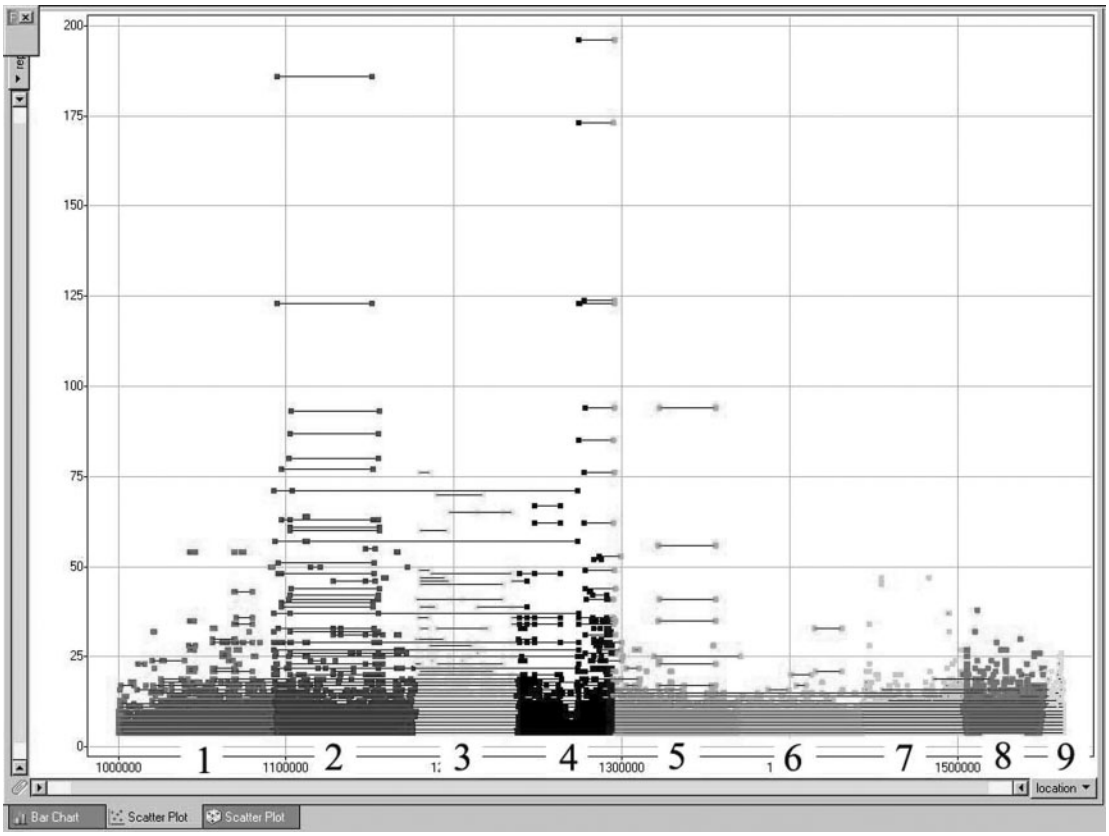

Fig. 6 Repetitions (*x*-axis = location, *y*-axis = length), *Spotfire*. (Colour image available as supplementary data in *Literary and Linguistic Computing* online.)

the center of the text, straddling chapters 4 (in black) and 5 (in green) (colour image available as supplementary data in *Literary and Linguistic Computing* online). The long repeated section co-occurs in the Dalkey Archive Press 1995 edition on pages 443 and 480, respectively, making the midpoint between them page 462, which is also the exact center of this 924-page book. Reading from the left, the repetitions rise in length in chapters 2, 4, and 5, and descend again in the later chapters 6, 7, and 8 until the longer repetitions are indiscernible on this scale by chapter 9. What is clear from this map of repeated patterns is that Stein has marked the center of the book and that there is a change in the form between the two halves of the text. What is not yet clear is what that change is and why it occurs.

In order to use this visualization to understand this transformation, what is being measured in the visualization must be clarified. The scatter plot featured in Fig. 6 has been created from a database of repeated phrases derived from the text.[19] Each item in the database is an independently recurring string within the text (including characters and punctuation) that occurs at a specific location.[20] For example, if the four-token string 'abcd' occurs twice in the text (once in chapter 1 and once in chapter 9) it appears twice in the database with two different locations but the same ID. The count of occurrence is based on a closed set so subsets of these two instances of 'abcd' are not included in the database; however, if one of the substrings occurs independently in another location within the text (e.g. 'ab' also occurs one other time in chapter 4) the database includes the two instances of 'abcd' and the three instances of 'ab' with a new ID. According to Table 1 (which represents an excerpt from the database of repetitions),

Table 1 Excerpted data from the repeated phrases database

Chapter	Location	ID	Length	Count	Repetition
9	1552187	137374	11	2	One coming to be almost an old one. Any one
9	1552345	137374	11	2	One coming to be almost an old one. Any one
9	1552189	137343	6	36	To be almost an old one
9	1552023	137343	6	36	To be almost an old one
9	1552347	137343	6	36	To be almost an old one

the string 'one coming to be almost an old one. Any one' occurs only twice in the text, both times in chapter 9 and shown here. The subset string 'to be almost an old one' occurs three times in chapter 9 (all shown here) but thirty-six times over the course of the text. The three paragraphs shown in Fig. 7 illustrate the complexity with which the overlapping repetition occurs in chapter 9.[21]

Figure 8 illustrates the same information from the scatter plot view: the top repetition with ID 137374 is 'one coming to be almost an old one. Any one'. It occurs twice here, and as the longest string in this block of paragraphs, it is positioned highest on the *y*-axis. The two matches are connected by a line. The shorter string 'to be almost an old one' (ID 137343) is positioned below the previous match where it occurs three times, and the line that links it to its match runs through other matches of the same length (10 tokens), making that line indistinguishable.

Decidedly, it is difficult to visualize the relationship between the shorter, more frequent repetitions and the longer, less frequent repetitions since their multiple connections are lost in the mass of dots and lines pictured at the bottom of the visualizations in Figs 6 and 8. Patterns in Chapter 9, zoomed (*x*-axis = location, *y*-axis = length), *Spotfire*. For, it is not just that words are repeated, but also the length of the repetitions and the frequency with which they occur. As such, the combination of longer, less frequent repeated patterns and shorter, more frequent repeated patterns creates a visual affect that mimics the experience of reading the complex patterning of the text as a whole: confusing. Once we begin to recognize this distinction between shorter, more frequent repetitions and longer, less frequent repetitions, reorienting the data to visualize these patterns is possible. For instance, the repetition ID, as a one-to-many representative, has associated with it all the information for each instance of each repetition, including how frequently that repetition occurs, its length, and where the repetition appears first and last. As such, the ID may function as the combinatory form of the repetition. Accordingly, this ID may be used to discern each repetition's behavior across the text. Plotting the behavior of a repetition as one object (instead of each repeated occurrence within that group) decreases the data plotted on the graph and, therefore, the 'noise', providing for a clearer mapping of the textual patterns. For instance, Table 2 includes the database information pertaining to repetition ID 9872 ('any such a thing'). According to Table 2, repetition ID 9872 occurs ten times across the text, first in chapter 1 (location 1016602) and then in chapters 2, 5, 6, 7, and finally in chapter 8 (location 1519323). Because the sequence IDs in this database are numbered to represent the order of the first occurrence of each repeated sequence as it occurs in the text, plotting the repeated patterns by this ID means that we may plot each sequence by its first appearance in the text. At the same time, because the color of the marker indicates the location of each ID's final occurrence in the text, the end point for each sequence is also visualized. In addition, treating each repetitive pattern as a single object makes it possible to visualize and compare the three dimensions upon which each repetition co-occurs—by length, frequency, and location. In this way, we are able to distinguish where each pattern begins, ends, how often it occurs, and its length in a single view. For instance, in Figs 10 and 11, the *y*-axis represents a sequence's length, the *z*-axis represents its count (frequency), and the *x*-axis illustrates where each pattern begins in the order in which it first appears in the

. . . Some have come **to be almost an old one** and have come to be a dead one. Some have not come to be a dead one, they are being living. Some have come to be a dead one.

Some are not believing that any other one can really be only doing the thing that other one is doing. . . . Any one is one being a dead one. Any one is one being such a one. Any one is one coming **to be almost an old one**.

Any one is one only not needing to be understanding everything. Any one is one who might have been doing the things that one is doing. Any one is one who might do that thing, the thing that one is doing. . . . Any one might be one and some might be believing that that one has been doing what that one has been doing.

Any one might be one coming **to be almost an old one**. Any one might be one coming to be an old one. Any one might be one coming to be a dead one

Fig. 7 Paragraphs 3067–3070. (Colour image available as supplementary data in *Literary and Linguistic Computing* online.)

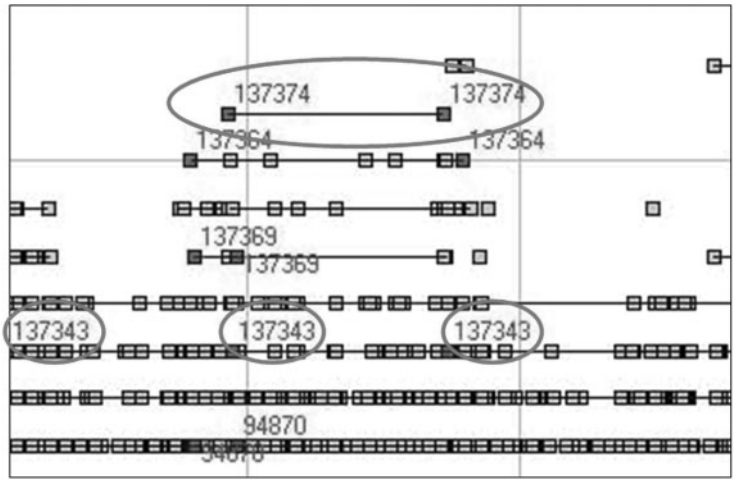

Fig. 8 Patterns in Chapter 9, zoomed (*x*-axis = location, *y*-axis = length), *Spotfire*. (Colour image available as supplementary data in *Literary and Linguistic Computing* online.)

text. The color of a pattern shows where it last appears.

In Fig. 9, ID 9872 is plotted where it first appears, in a location on the far left side of the *x*-axis (i.e. in the general location of chapter 1) but the lavender color, which represents chapter 8, indicates that ID 9872 appears last in that chapter. In Figs 10 and 11 the behavior of each unique combinatory repetitive object is represented. Since, the color (Colour images available as supplementary data in *Literary and Linguistic Computing* online) and the position of each object corresponds to each repetitive object's movement across the text, the distinct structural difference between the first and second halves of the text is well illustrated. At first glance, it appears that many of the repetitions remain 'local' since

Table 2 Excerpt of data from the repeated phrases database

ID	Length	Count	Repetition	Location	Chapter
9872	4	10	any such a thing	1016602	1
9872	4	10	any such a thing	1100331	2
9872	4	10	any such a thing	1310177	5
9872	4	10	any such a thing	1310391	5
9872	4	10	any such a thing	1414671	6
9872	4	10	any such a thing	1445344	7
9872	4	10	any such a thing	1463523	7
9872	4	10	any such a thing	1506677	8
9872	4	10	any such a thing	1507294	8
9872	4	10	any such a thing	1519323	8

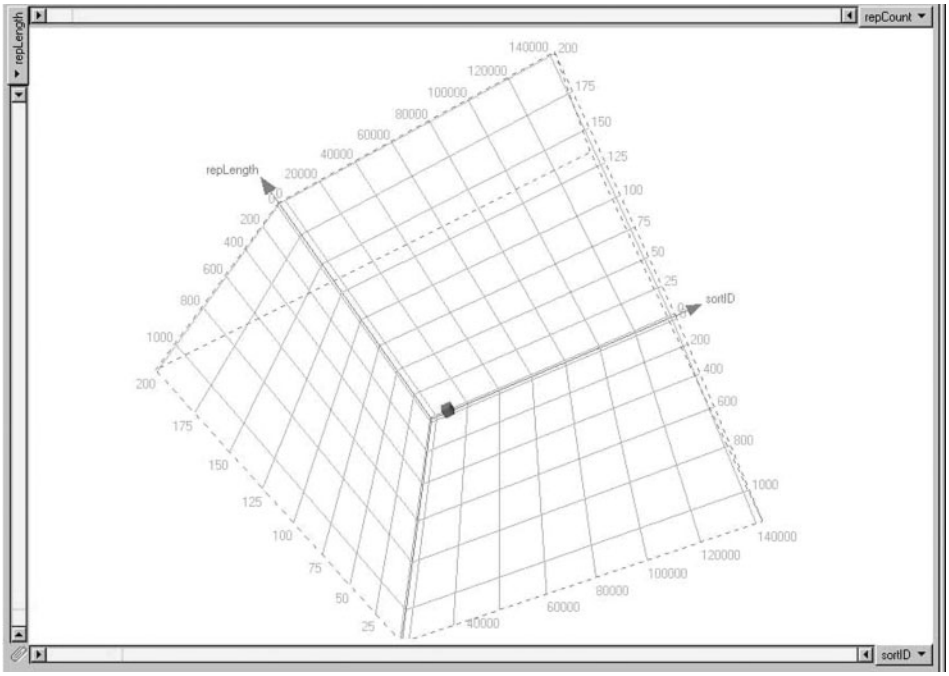

Fig. 9 ID 9872 plotted on 3D scatter plot (*x*-axis = location, *y*-axis = length, *z*-axis = frequency), *Spotfire*. (Colour image available as supplementary data in *Literary and Linguistic Computing* online.)

plotting the IDs in this manner corresponds to a sequential chapter mapping from left to right much like the one that appears in Fig. 6. This first impression is the result of the fact that many of the repetitive objects appear first and last in the same chapter. Consequently, many of the combinatory objects maintain both the color and the relative sequential position in accordance with the discrete mappings in Fig. 6. On closer inspection, however, another pattern emerges. The figure is actually skewed in comparison to Fig. 6. Chapters 6, 7, and 8 take up considerably less space on this image. The longer repetitive objects, which we are better able to discern on the *y*-axis in Figs 10 and 11, are more consistently local in the first five chapters; they represent the illustration in Fig. 6. In comparison, the shorter repetitive objects that occur on the *z*-axis in Figs 10 and 11 do not mimic that visualization. These repetitive objects (primarily colored in the pastel shades that represent the chapters of the

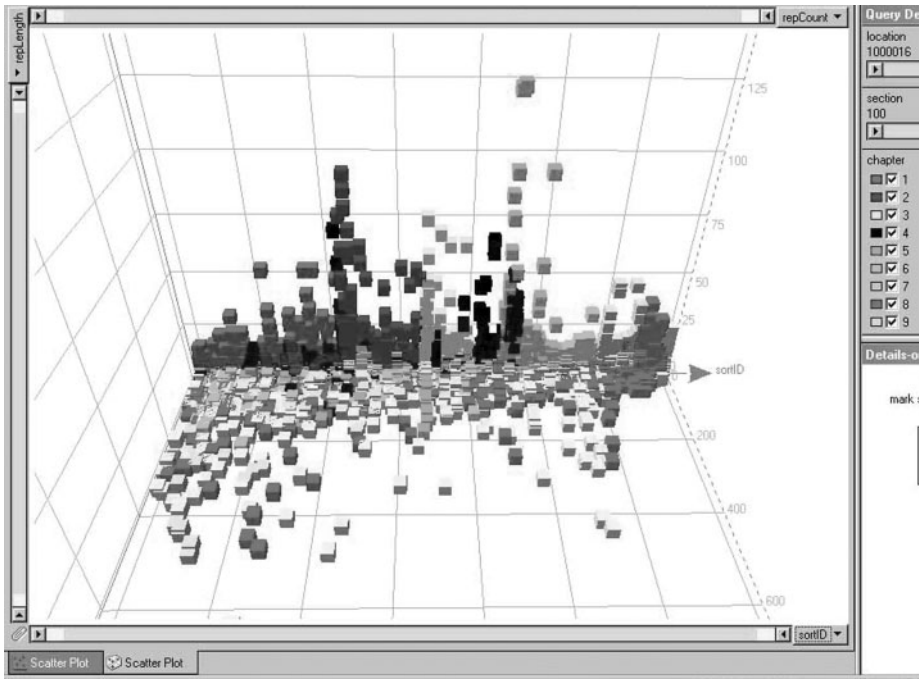

Fig. 10 Repetition ID plotted on 3D scatter plot (*x*-axis = location, *y*-axis = length, *z*-axis = frequency), *Spotfire*. (Colour image available as supplementary data in *Literary and Linguistic Computing* online.)

latter half of the text) are erratic; they are scattered without apparent order across the lower wall. As a result, we can discern from this visualization an overall pattern for the text that has been previously undiscovered: the longer and less frequent repetitions are usually local to the first half of the text while the shorter, more frequent repetitions run across the text as a whole.

But what does this mapping mean in terms of analyzing the text for meaning? How does this map—this reading at a distance—facilitate an alternative direction or perspective for reading the text?

To this end, chapter 9 provides the legend: it is a measurement of relative scale by which we can read the greater map. Understanding how chapter 9 is structured aids how we can understand the larger text. Stein refers to chapter 9 as a 'rhapsody' perhaps alluding to one definition of the term which denotes an unstructured, often passionate, instrumental composition (Stein, 1974, p. 503; *Oxford English Dictionary*, 1989). However, it is equally reasonable to assume that she thought of the word's other definition: 'an epic poem or part of one, e.g. a book of the *Iliad* or *Odyssey*, *suitable for recitation at one time*' (*Oxford English Dictionary;* emphasis added) and conceived of chapter 9 as such a compositional object—part of the larger text but complete in and of itself. As such, its structure warrants a closer look. Chapter 9 comprises 18.5 pages (the exact distance from each set of long repetitions in chapters 4 and 5 to the center of the text) and its title mirrors the text's title ('History of a Family's Progress') minus what perambulates the larger text—the narrator's discussion of the 'making' of that history. By chapter 9, the narrator has dropped out, the characters that no longer appear, and a general family history (not the particular Hersland family history) is told.

Furthermore, mapping repetitions limited to chapter 9 on a scatter plot (Fig. 12), illustrates a pattern very similar to the first half of the larger text (Fig. 6) in that shorter, more frequent repetitions are nested between longer, less frequent repetitions that usually occur in pairs (e.g. the match marked 'A').[22] At the same time, this mapping

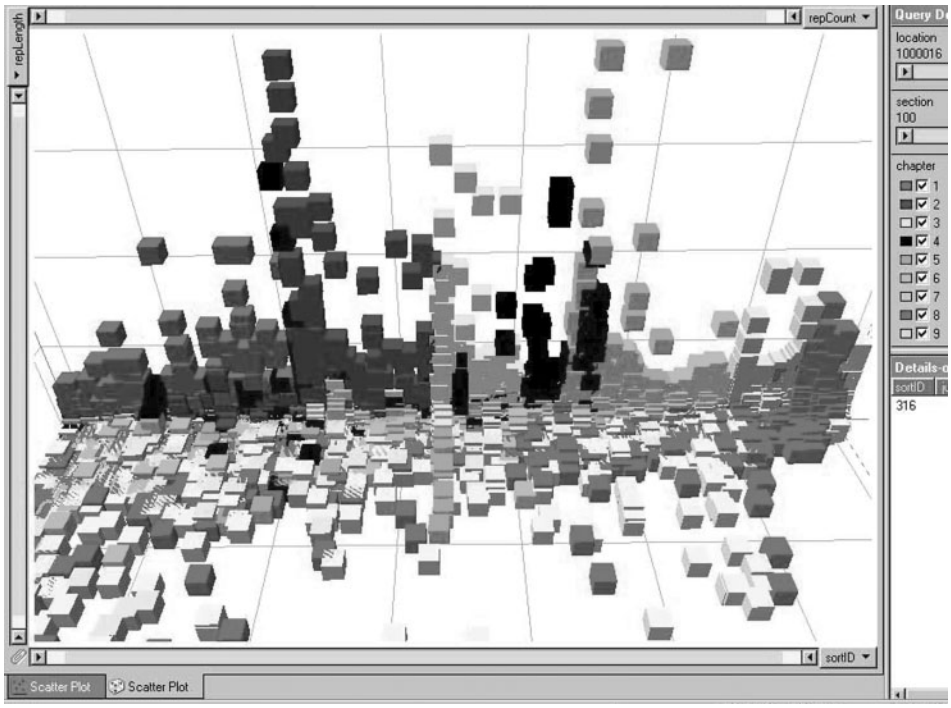

Fig. 11 Repetition plotted on 3D scatter plot (*x*-axis = location, *y*-axis = length, *z*-axis = frequency), *Spotfire*. (Colour image available as supplementary data in *Literary and Linguistic Computing* online.)

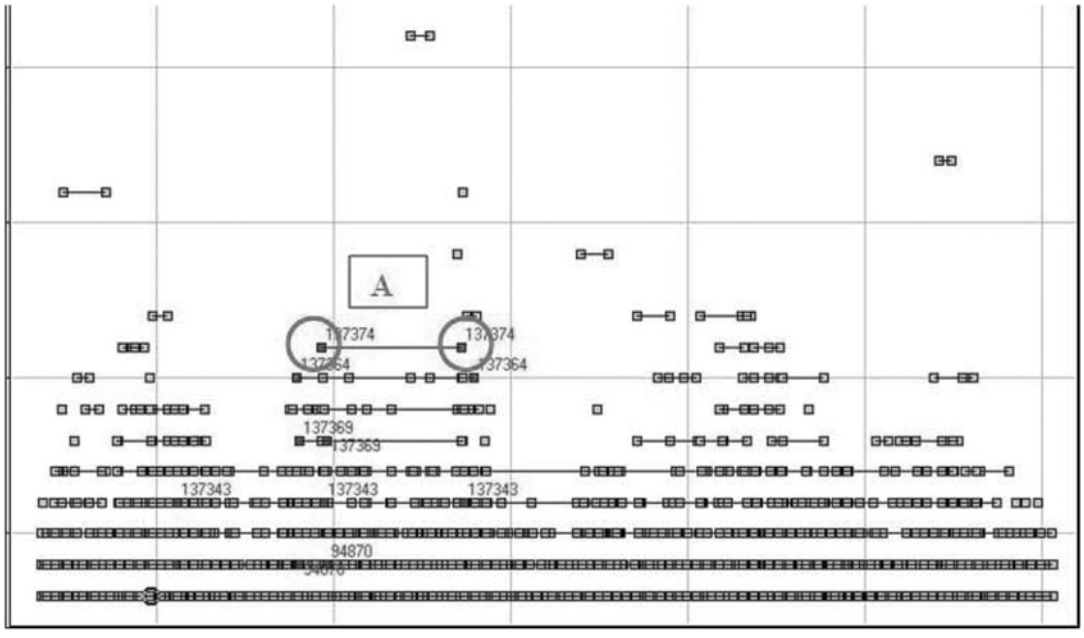

Fig. 12 Chapter 9, *Spotfire*. (Colour image available as supplementary data in *Literary and Linguistic Computing* online.)

appears to contradict what appears in Fig. 6 where chapter 9 is much like the second half of the text in which repeated strings are shorter and not so varied in length.

That mapping of chapter 9 reflects characteristics from both halves of the text does not present a contradiction so much as to indicate a relative scale for reading the formally complex patterns that result from combining those two halves together. Chapter 9 comprises 557 sentences with only 238 unique words. Within it, there are seventeen simple yet abstract declarative sentences that are repeated verbatim. The significance of this base of seventeen sentences is emphasized by the fact that they are the only sentences repeated exactly in a chapter that is otherwise a cacophony of minute variations. The other sentences correspond to the base sentences as either a change or a compound of the base sentence's subject, subject phrase, verb, or verb phrase. Consequently, the sentences that precede and follow a base sentence usually draw on the theme of the base sentence and then radiate or expand its meaning. For example, the first paragraph of chapter 9 follows:

> **Any one has come to be a dead one**. Any one has not come to be such a one to be a dead one. Many who are living have not come yet to be a dead one. Many who were living have come to be a dead one. Any one has come not to be a dead one. **Any one has come to be a dead one**. (¶3064; emphasis added)

In the above paragraph, the variation sentences are nested between two instances of the sentence 'Any one has come to be a dead one' (shown in bold) and may be read as variations used to make this 'book-end' sentence more distinct. Correspondingly, the meaning of the base sentence is understood to be a function of the truth of the other statements. For instance, that 'Any one has come to be a dead one' is predicated by the fact that any one is living or 'has not come to be such a one to be a dead one'. Another example appears towards the end of the chapter. The sentence, 'Old ones come to be dead' (A) is repeated three times. After its first appearance, another repeated sentence—'Any one coming to be an old enough one comes then to be a dead one' (B)—occurs. A and B are followed by simple variations, such as 'Old ones come to be dead ones' and then more complex variations such as 'Any one not coming to be a dead one before coming to be an old one comes to be an old one and comes then to be a dead one as any old one comes to be a dead one' (¶3166). More variations follow, but repetitions A and B remain interspersed making an ABAAB pattern. As such, we see what happens when combinations are formed: the meaning of declaration A ('Old ones come to be dead') is coupled with declaration B in such a way that the term 'old ones' becomes forever trapped in a circular ontological stance. Pulled out by a centrifugal force of indeterminacy ('any one coming to be an old enough one' = old one) and the centripetal force of utter determinacy (dead = old one), there is an epistemological vortex present here ('I won't know if I'm an old enough one until I'm dead and then I may not know anything anyway') encapsulated in the juxtaposition of two simple (albeit abstract) declarations. The resulting combination of utterances forms the composition of a complete thought as it is expressed over time. Correspondingly, the two halves of the larger text function in much the same way: just as the variations on the 'base', sentences in chapter 9 are complicated by the rearrangements introduced by subsequent sentences, the function of the second half of the text is to develop complexities and contradictions that complicate the knowledge produced in the first half of the text by using the same words and sequences introduced there, but using them in variation.

This analysis has shown that *Making* is structured as a determinate object that progresses with its two distinct halves as interdependent forces. These new mappings of the text are important when considering *The Making of Americans* as a modernist text, since from this new perspective (afforded by the digital analysis of the larger text) it can be argued that indeterminacy is not privileged as an essential reading.

4 Reading *The Making of Americans* Closer, Differently

Yet, the fact that reading the text yields much confusion is undeniable. 'Each part is as important as

the whole', Stein writes about *The Making of Americans* and as such, 'it was not solely the realism of the characters but the realism of the composition which was the important thing, the realism of the composition of my thoughts' (Stein, 1971, p. 502). As such, the text itself is the real-time reckoning of the human tendency to balance determinate and indeterminate knowledge and its expression, and as such, the relationships established between the parts of the text, whether it be the combination of words, phrases, sentences, paragraphs, whole sections, or themes, is not a means to this end so much as the end itself.[23]

During the writing of *Making*, Stein was very interested in the notion of art as the composed or constructed object, especially as she saw it codified and practiced in the creative work of Cézanne and Picasso, each of whom she viewed as a 'master of the realisation of the object itself' (quoted in Walker, 1984, p. 19). Accordingly, *Making* is not merely 'about' American identity but an object of twentieth century American*ness* that necessarily entails an element of indeterminacy as a compositional part. Clearly, Stein believed that there was a symbiotic relationship between the composition's structure and what it expressed: 'the twentieth century was the century not of sentences as was the eighteenth not of phrases as was the nineteenth but of paragraphs', she says, and 'The Making of Americans really carried it as far as it could be carried so I think the making a whole paragraph a whole thing' (Stein, 1975, p. 285). In other words, what seems indeterminate in the process of charting and describing every possible variety of human type is also what becomes indeterminate in the intricate and complex expression of repetition with variation. For instance, one element that makes the composition of identity and the composition of Stein's thoughts unknowable or indeterminate is time. It was 'not enough', Stein says, 'to satisfy myself with a whole thing as a paragraph as a whole thing . . . at the same time is the question of time' (Stein, 1975, p. 285). That is to say, time—especially as it functions in linear narratives—acts as a hierarchical force rendering combinatory forms irrelevant since the iteration of type over linear time privileges the 'latest update' and makes each previous iteration inherently unequal. Accordingly, Stein wished to embattle the inevitable line that time draws in traditional narrative in order to show that each human utterance of character is an equally important signifier of type regardless of the moment in life (in one's story) in which it is uttered: 'as soon as a child is conscious of itself', she says, 'then it has to me an existence and has a stake in what happens. Everybody who has that stake has that quality of interest' (Stein, 1971, p. 503). In reality, the child who is conscious of himself anticipates the man he will become just as the man recalls the child he once was—consequently, the combinatory form exists in each phase and shapes the 'endless surprises' of human nature. In addition, Stein was aware that her 'failure' to make the composition of her thoughts real (or 'whole') was also a contingency of time:

> When I was up against the difficulty of putting down the complete conception that I had of an individual, the complete rhythm of a personality that I had gradually acquired by listening seeing feeling and experience. I was faced by the trouble that I had acquired all of this knowledge gradually but when I had it I had it completely at one time. And a great deal of The Making of Americans was a struggle to do this thing, to make a whole present of something that it had taken a great deal of time to find out, but it was a whole there within me and as such it had to be said (Stein 1975, pp. 277–278).

In fact, this ever-present contradiction that Stein recognized as the simultaneous occurrence of a 'moving' knowledge that has an immediate aspect ('knowledge-of-acquaintance') and a more static 'knowledge about'[24] element moved Stein to create a text that instantiates what she determined was a way of accessing both, while also satisfying her desire to write what she called a specifically twentieth-century American novel. In other words, Stein found a motive to use a combinatory structure that embodies both the formation of 'self' or being in a nation that was just beginning to know itself and her own process for expressing that formation:

> Think of anything, of cowboys, of movies, of detective stories, of anybody who goes

> anywhere or stays at home and is an American and you will realize that it is something strictly American to conceive a space that is filled with moving, a space of time that is filled always filled with moving and my first real attempt to express this thing which is an American thing began in writing The Making of Americans (Stein, 1975, pp. 285–286).

This is to say, in her attempt to construct this object that is a space 'filled with moving' and the 'continuous present'—a space in which hierarchical forces of space and time are suspended—she is attempting to concretize (make a complete object of) the non-hierarchical, combinatory structure of human character as it is expressed over time. As a result, Stein has given her readers the same experience that the narrator and her characters who are confused about the process of knowing and expressing themselves over time experience: confusion.

With a new perspective facilitated by mapping the larger structure, however, we learn to read the text differently. For instance, instead of focusing on the Hodder episode as a singular point of entry, we begin to weigh the significance of the other narrative episodes within the terms of this new combinatory framework. The first narrative gap illustrated in Fig. 3 pertains to Julia Dehning's attempt to persuade her father to let her marry Alfred Hersland. Mr Dehning believes that 'Facts can never tell anything truly about another man' and so Julia tries to persuade him 'by always repeating' her argument (¶127). This description could well serve as a key to reading the first half of *Making* in which alternations between telling (diegesis) and explanation (exegesis) expose the tension between facts and our experience of them at different points in time. The second large gap pictured in Fig. 3 (marked '2') is the story of Mrs Shilling and her daughters Sophie and Pauline. This story represents the first narrative in the text about the less affluent people with whom the Herslands live including the families of their governesses, seamstresses, and servants in the surrounding Gossols (a fictional Oakland, CA). Eventually, these 'others' have a greater impact on David Hersland than his own parents, such that a description of him is the description of many: 'The youngest of the three Hersland children David Hersland was so entirely of them', the narrator writes, 'was so entirely of the being of all these children that in the description of the being in him there will be very much description of the being in many of them' (¶1579). Therefore, while the first gap (marking Julia's argument with her father) introduces the ontology with which Stein struggles (whether facts are simply just repeated experience), the narrative presented at the second gap becomes significant in terms of the larger text because it engages the epistemological questions with which Stein deals primarily in the second half of the text—namely, how do we know if our knowledge is whole or true?

One last example will serve to illustrate how reading the text as a combinatory structure facilitates its reading. In *The Making of Americans* both chapters 4 and 6 refer to Martha Hersland as 'a whole one' simply because Martha is physically discrete from other human beings by the nature of having a skin that makes her such. That is to say, Martha has no internal definition based on a sense of self; she is, quite simply, just not in some one else's skin. The key cluster[25] that describes Martha is 'a mushy mass of independent dependent being with a skin holding it together from flowing away' (¶1533) in chapter 4 and in chapter 6, 'one [who] by her skin cutting her off from any other one . . . had attacking being that never did more than just wobble in her' (¶2157). Ultimately, Martha, who is 'a whole one' is 'not any more, at all, interesting to the one knowing [her]' (¶1527) and accordingly drops out of the narrative. This very physical description of Martha's character (her individual nature is based on the simple fact that it and not another 'wobbles' inside her skin) is abrupt in the context of the much more abstract character descriptions that refer to Redfern, Julia, and Alfred. However, reading this description in conversation with a similar key cluster in the first chapter illuminates its portent. In the first chapter, women who have heads that 'look loose and wobbly on them' give the narrator a 'queer' or 'uncertain feeling' (¶369). In particular, in the Shilling episode (gap 'B', Fig. 4) the narrator explains that the Shilling women are three 'queer' women whose 'possible queerness' might really be the result of a physical 'hole'. The narrator writes:

> . . . they had lost something out of them that should have been inside in them, that

> something had dropped out of each one of them and they had been indolent or stupid or staring each one of them then and they had not noticed such a dropping out of them. Each one of them had perhaps a hole then somewhere inside in them and this may have been that which gave to each one of them the queerness that it was never certain was ever really there in any one of them. (¶369)

One can easily draw a comparison between this 'hole' and the gaps in repetition that appear across the first half of the text to conclude that the narrator is alluding here to the fact that definition or ontological knowledge may always be defined by a 'lack'—that is, a generalized reckoning of a person or thing will always be indeterminate or missing some aspect.

It is also worth considering that 'hole' also calls upon the concept of 'whole' knowledge or truth and the epistemological questions to which Stein turns her attention in the second half of the text. Thus, Martha, who represents the successful skin, is ultimately 'a whole one' and 'not any more, at all, interesting to the one knowing [her]' and the Shilling daughter who represents 'the hole one' is finally 'self-defensive' with 'no power' and, likewise, 'had no appeal to anyone who came near her because they never could really come close to her, she could not let them touch her lest they should push a hole into her' (¶394). Thus, neither the 'whole' knowledge nor the 'hole' knowledge are privileged. In addition, drawing a comparison between the process of physical creation (the birth of a child or 'such a dropping out of them') and knowledge formation which are both necessarily dependent on the holes, gaps, fissures, and ruptures upon which these creations depend, leads the reader to consider that the formation of knowledge is a cycle dependent on the ongoing creation that results from this push and pull, from the centrifugal force of the center (the 'hole' in knowledge through which one's perceived sense of truth must drop out), and the centripetal force of its outer edge (the 'whole' knowledge or the skin that struggles to keep that idea of truth in).

Finally, how these more philosophical questions relate to the structure may be read within the narrator's discussion of legitimacy and identity at the beginning of David Hersland's chapter, chapter 7. 'I do ask some if they would mind it', she says, 'if they had been born illegitimate' (¶2441) for this question of legitimate identity, she contends, provokes one to construct stories:

> I am quite certain very many would not like to have me ask it if they would like it, if they would very much dislike it, if they would make a tragedy of it, if they would make a joke of it... I would like to know how everyone can be feeling about such a thing, if they have any feeling about any such thing. (¶2441)

Ultimately, she is saying that the drive to feel wholeness and completeness (or truth and answers) is the same drive that provokes us to create stories, the tragedies, and comedies to which the narrator alludes above. Just as certain is the fact that the nature of stories (which can never be exact or real) stimulates our need to identify the gaps, the absences, or anything that proves that stories cannot define the 'endless surprises' that make us who we are. Accordingly, in the first half of the text, the narratives tell the progression of this family and its history in a traditional, nineteenth century, realist mode, while the repetitive sentences and paragraphs serve as the more mimetic reminder of the impossibility of exact replication. Figure 13 visualizes this pattern in chapters 2, 4, and 5 which comprise some of the major narratives in the first half of the text (about Mary Maxworthing and Mabel Linker) and in the center of the text (about Redfern's lover Cora Donour and the parabolic stories about a girl named Edith and a boy who collected butterflies). The lines in Fig. 13 represent some of the pairings that exist between repeated structures.

By alternating the narrative and the repetitive sections, the circular nature of the Hersland family identity (in terms of its physical, familial inheritance) and its history (in terms of its telling) is emphasized in the first half of the text. Likewise, the impending 'whole understanding' that is implied by the end or 'death' of the text in the second half generates the impetus to return to

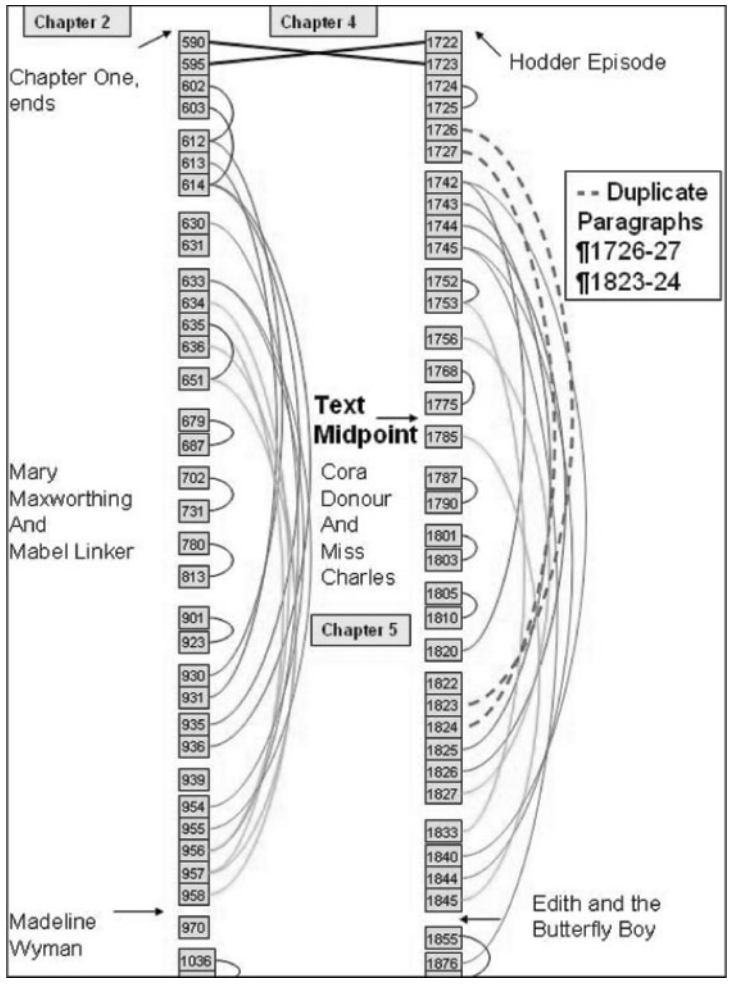

Fig. 13 Flow chart of two cycles of repetitive patterns, *PowerPoint*. (Colour image available as supplementary data in *Literary and Linguistic Computing* online.)

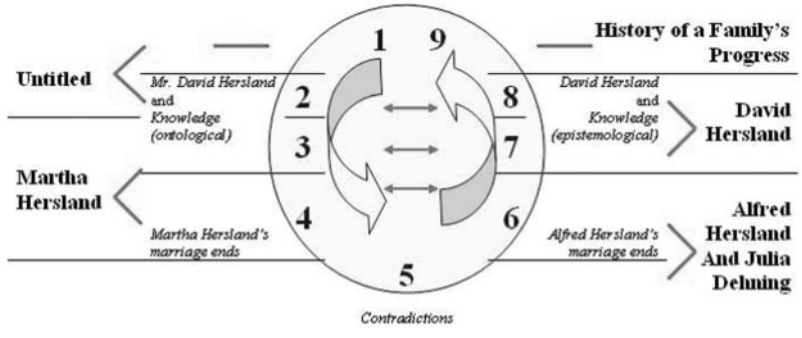

Fig. 14 The circular nature of *The Making of Americans*.[26] (Colour image available as supplementary data in *Literary and Linguistic Computing* online.)

these narratives. After all, the narratives, though 'hole-ridden' have the effect of seeming understandable, of supplying a 'whole' understanding. Yet, in returning to the narratives, the cycle begins again. Consequently, the bicameral structure of the text serves to signal relationships between the themes that correspond across the two halves of the text (illustrated in Fig. 14), making that repetition necessary for the reader's understanding.

According to this perspective, Stein's 'whole history' is established by combining an ontological consideration for what makes a history whole or generalizable (by assigning categories, words, and narratives to express what is indeterminate) in the first half of the text and, in the second half of the text, an epistemological consideration for how we know it to be whole (by the act of questioning those very assignations).

5 Conclusion

Ultimately, this circular form serves Stein's purpose to 'make a complete history of everyone' since '[a] thing not beginning and not ending is certainly continuing'. She writes,

> . . .one completely feeling something is one not having begun to feel anything because to have a beginning means that there will be accumulation and then gradually dying away as ending and this cannot be where a thing is a complete thing (¶2395).

In this way, the form of the text justifies the perception that there is no discernible starting or ending point—no linear or hierarchical 'accumulation and dying away'—since each repetition has one or more partners that participate in its meaning at any one time. In addition, this history of 'pairings' (¶846) adheres to Stein's modernist ideal for creating a 'complete' thing in that it consistently points back in on itself: '[O]rdinarily novels of the Nineteenth Century live by association'; she writes 'they are wont to call up other pictures than the one they present to you... While I was writing [*The Making of Americans*] I didn't want, when I used one word, to make it carry with it too many associations' (Stein, 1974, p. 493). Accordingly, distant reading has shown us a guide to those relationships that facilitate how to do a closer, combinatory reading. Certainly 'only reading' *The Making of Americans*—or reading it in a traditional way—appears to have yielded limited material for scholarly work, but reading the text differently, as an object of pairings or as parts of combinations, ultimately works in contrast to the supposition that the text is only meaningful to the extent that it defeats making meaning. Finally, a distant view of the text's structure allows us to read and better understand its repeating, to read the text as an object that becomes, as it continues to turn in on itself with a centrifugal force, a whole history without beginning or ending—an alternative reading, indeed.

Supplementary data

Colour images mentioned in the text are available as supplementary data in *Literary and Linguistic Computing* online.

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Notes

1 In particular see Katz (1963), Bridgman (1970) and Dydo (2003).

2 Some examples include Ruddick (1990); **Watten (1998)**; Berman's chapter 'Stein Topographies: The Making of America' (Berman, 2001); and Wald (1995).

3 The version of this text cited here is an electronic, XML-encoded document derived from a PDF that was based on the Dalkey Archive Press 1995 edition of *The Making of Americans*, which is a copy of the version Stein published in Paris with Contact Editions in 1925. Throughout this article, references to the text refer to paragraph numbers in the electronic edition and are indicated using the paragraph (¶) symbol. At this time, the electronic version is not publicly available.

4 The MONK project (http://www.monkproject.org/) is a Mellon-funded collaborative including computing, design, library science, and English departments at multiple universities which is developing text mining and visualization software in order to 'explor[e] significant patterns across large collections of full-text humanities resources' ('Project Description').

5 D2K was developed by Michael Welge's team in the Automated Learning Group (ALG) at the National Center for Supercomputing Applications (NCSA) at University of Illinois at Urbana-Champaign (UIUC) http://www.alg.ncsa.uiuc.edu.

6 *n*-Grams may be thought of as a sequence of items of '*n*' length, usually used as a basis for analysis in natural language processing and genetic sequence analysis.

7 For more on the algorithm used please see Pei *et al*. (2000).

8 For more information on *FeatureLens*, please see Don *et al*. (2007). The list of participants and more about this project is at http://www.cs.umd.edu/hcil/textvis/featurelens/.

9 Each line in area C represents five paragraphs in order that the user may see the whole text at once.

10 This data actually represents the compilation of two lists of frequent patterns. One comprises the most frequent singular words across the text. The other is

a list of the most frequently co-occurring three-grams across the text based on a dataset with a minimum support of ten; thus, a three-gram must occur in at least ten paragraphs for it to be included in the dataset.

11 The current iteration for *The Making of Americans* is at http://monk.lis.uiuc.edu:6060/openlaszlo-3.3.3-servlet/my-apps/featurelens-moa/src/featurelens.lzx.

12 Many of the figures in this article originally appeared in color, an aspect of the visualizations that greatly facilitates their usefulness and comprehensibility. For full color figures, please see this article online.

13 The Hodder episode was first identified by Leon Katz in 'The first making of The Making of Americans'. Other discussions of the episode are numerous. In particular, see Moore (1998).

14 Spikes in the distribution are measured as follows: Let $F = f1, f2, \ldots, fn$ be one frequency values per section for n sections for one word. Let M be the mean value of $f1 \ldots fn$. Let S be the value of the standard deviation of $f1 \ldots fn$. If one value of $f1 \ldots fn$ is above $M + S$ then it is considered a spike. These distributions are then ordered according to the value of the spike minus the mean, from the biggest to the lowest.

15 In its current state, *FeatureLens* does not allow the user to picture all of the patterns at once. Nonetheless, the 'children' pattern is a useful measurement for showing the narrative alternations in chapters 1–5.

16 This evaluation is based on the 1995 Dalkey edition.

17 The first and second chapters remained untitled until Stein published an abridged version of *The Making of Americans* in 1934 with Harcourt, Brace. With the abridged version, she titled the first chapter 'The Dehnings and the Herslands' and the second chapter 'Mrs. Hersland and the Hersland Children'.

18 This number refers to the sixteenth word (including the title *The Making of Americans*) in the text ('through') which begins the first repeated string 'through his own'.

19 In coordination with Martin Mueller (a Monk collaborator in the English and Classics departments at Northwestern University) who was interested in the repetition in Homer, Craig Berry wrote the software that was used to derive this data from the text. At the time, Berry was working with NU's Academic Technologies—a unit within the Northwestern University Library. They ultimately created the 'Chicago Homer' http://www.library.northwestern.edu/homer/, which produces the same kind of data for the *Iliad* and *Odyssey* as well as for the poems of Hesiod and the Homeric Hymns.

20 The data have been limited to strings that are three tokens (excluding strings that contain function words or punctuation) and greater (including strings that contain function words and punctuation).

21 Structures, such as sentence and paragraph boundaries are not 'counted' in this data—that is, the entire text is treated as one long paragraph so that repetitions that cross these boundaries are treated as matching pairs.

22 Each of the seventeen base sentences in chapter 9 occurs twice except for two which are repeated three times and two that are repeated outside that chapter in chapter 8.

23 Jennifer Ashton does much to forward the argument that *The Making of Americans* better represents a modernist than a postmodernis text for much the same reason in her chapter 'Gertrude Stein for Anyone' in *From Modernism to Postmodernism* (2005). She does not, however, demonstrate that the structure of the text's parts also support this claim.

24 These terms—'knowledge-about' and 'knowledge of acquaintance'—were first explored in depth by William James, Stein's mentor at Harvard. In a 1904 essay entitled 'A World of Pure Experience', James explores the relationship between the subject and the object, 'the knower and the known' which '[t]hroughout the history of philosophy . . . have been treated as absolutely discontinuous entities; and thereupon the presence of the latter to the former, or the apprehension by the former of the latter, has assumed a paradoxical character which all sorts of theories had to be invented to overcome' (James, 1912, p. 52).

25 I use this term to denote key words or phrases which occur infrequently in the text and serve to tie together moments in the narrative that are otherwise seemingly unrelated.

26 Using ring composition as a model, chapters 1, 5, and 9 have been positioned, respectively, as the introduction, the turning point, and the latch according to the criteria set forth in Mary Douglas' book *Thinking in Circles: An Essay on Ring Composition* (2007). Of the two formal criteria I surveyed pertaining to chiastic literary structures, I have chosen Douglas's seven conventions over Welch and McKinlay's fifteen criteria from their study *Chiasmus Bibliography* (Welch and McKinlay,1999), which covers studies in chiasmus across many literary genres and time periods. Douglas maintains that her criteria were chosen as necessary conventions that serve to mitigate the primary

technical problem of the ring composition (completing the revolution) whereas Welch and McKinlay are interested in chiastic and parallel structures in general. Since, I maintain that the successful construction of a ring is a formal requirement that allows Stein to accomplish her goals, Douglas's criteria may serve as evidence of its completion. In addition, Douglas outlines the history of a long-used literary form that has fallen into disuse in contemporary society, so much so that the first sure sign of a possible ring form, she contends, is the confused reader. Other relevant discussions of ring composition and chiasmic structures can be found in Robert Alter's essay 'The Characteristics of Ancient Hebrew Poetry' (Alter, 1987).