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# Dinner is ready! Studying the dynamics and semiotics of dinner

**Abstract:** Dinner, as the main meal in the West, is a symbolically laden practice. In this paper, we seek to better understand the cultural meaning of dinner by using a unique combination of a sophisticated quantitative methodology for studying non-linear dynamics and a careful interpretative cultural semiotic analysis. By using the Corpus of Historical American English, we retrieved the words significantly collocated with “Dinner” along 200 years. Using joint recurrence analysis, we have identified the words that synchronize with each other in a non-linear fashion and used them for constructing a representation of Dinner’s semiotic field. By analyzing the graph, it was found that “Soup” is the main concept associated with the practice of Dinner along 200 years. The meaning of this finding is interpreted by proposing a semiotic explanation pointing to the “surplus” of soup in the semio-sphere of the Western culture.

**Keywords:** semiotics, culture, food, dinner, dynamical systems, interdisciplinary research

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## 1 Introduction

Cultural psychology as the study of symbolic systems mediating the variety of human forms of thought and practice (Valsiner 2007) has always been interested in the symbolic value of food and food-related practices (Rozin 2007). Paraphrasing Freud, a food is never just food but always a psycho-cultural object loaded with meaning derived from associations, connotations, metaphors, and cultural practices in which those senses are embedded and materialized.

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Despite the great interest in the symbolic value of food and its related practices, one would hardly find a quantitative study that identifies its *dynamics* in a significant time span. The lack of quantitative studies dealing with the psycho-semio-cultural dynamics of food probably results from the lack of available historical data, the complex nature of systems under study, and the difficulty in representing and analyzing this dynamics in a meaningful sense.

In this paper, we focus on one main practice of food consumption – Dinner – the main meal of the day. More specifically, we study the dynamics and meaning of Dinner by analyzing the Corpus of Historical American English (COHA; <http://corpus.byu.edu/coha/>), which is the largest structured corpus of historical English ranging over 200 years of textual history. Through non-linear analysis of words/nouns collocated with Dinner, we have identified words that have been synchronized in their recurrent patterns.

Building a graph of these synchronized words and measuring the words' number of connected edges we have identified "Soup" to be the most important component of dinner. Our methodology follows the vision of Valsiner and Rudolph (2008) for using "qualitative mathematics" in order to understand the dynamic and Gestalt form of psychologically and semiotically mediated human behavior. The reason why "Soup" is so central to the dynamics of dinner over 200 years is elucidated by interpreting its historical origins and symbolic value.

## 1.1 Dinner as a cultural practice

Dinner is a highly contextual practice. As McMillan (2001) explains, in medieval England everyone knew when they should eat their breakfast (first thing in the morning), dinner (the middle of the day), and supper (around sundown). The food served at these meals was also quite standard. The English breakfast before 1800 was limited to toast. The differences in times of meals and variety of foods were evident between classes. Trivially, the nobles ate more food with greater variety than the middle-class traders and merchants and the peasants of the lower class (Albala 2002: 184–216). Indeed, for the lower classes soup was the main dish of the day. Prior to the French revolution, the most common food in France was a soup that contained a piece of bread with small pieces of onion and garlic all covered by boiling water. This is the same soup that was consumed a hundred years later by French coal miners and became a symbol of French poverty as Emile Zola describes it in his famous 1885 *Germinal*. Zola describes those poor miners coming back in the evening for a meal in which the soup is not only the

main dish of the day, but rather the only thing they will eat after a long day's work. The word in French for supper relates to this cultural or should we say gastronomical phenomenon (*souper*).

In early modern chronicles among high social strata, the greatest meal of the day was around noon because people went to sleep at sundown. The French king François I (1494–1547) used to wake up at five o'clock in the morning, dine at nine o'clock, have supper at five o'clock in the afternoon, and go to sleep at nine o'clock in the evening. The English king Henry VIII (1491–1547) dined at ten o'clock in the morning and had his supper at four o'clock in the afternoon. Louis XIV used to dine (*déjeuner*) at twelve o'clock (Mallery 1888: 196).

The development of factories and streetcars has led the middle class dining times in the same direction. McMillan (2001) emphasizes that these changes took place first in London and only then at the periphery, which lagged behind the big city. In contrast with the idea that innovations emerge from the periphery of the network, in the case of dinner the logic is reversed, with the changing patterns of dinner emerging from the Hub which is London and moving to the periphery. Today, dinner time in North America is more fluid than it was in the past, a fact that reflects the variety of practices characterizing these societies. In fact one may even infer the variety of practices in a given society by calculating the discrepancies in dinner time. Think about it, the more technological and variable is the society in terms of labor practices the more variety is allowed for dinner time. Some people may work from home; some are obliged to keep the late working hours of competitive high-tech companies, and some may work in night shifts that oblige them to eat the main meal even earlier than their mediaeval compatriots.

## 1.2 Eating and dining

In many European languages there is a separation between to eat and to dine. The first relates to sustenance. The second is connected with social and cultural experience. The one reflects a biological need; the other is related to a more sophisticated practice that is connected with an established organized meal with no direct connection to the basic physical need. When someone is hungry he will eat. Sitting around a dining table has nothing to do with being hungry. In early modern societies the poor would eat *anytime* they came across food (Mallery 1888: 195). For the higher classes eating was associated with social-political engagement. Therefore, when studying the dynamics of dinner we necessarily study the culturally laden practices associated with the main meal of the day.

The social aspect was behind such exterior elements as manners, tablecloth, dressing properly, and so forth. *How* to eat became much more important than *what* to eat. In this respect it is interesting to note the different presentations in early modern painting between someone who is eating and someone who is dining. Indeed, it is also reflected in the social standing of both actions. The actual eating is presented only by people of low social standing or children. They will be seen as chewing. Dining will be shared by high social standing. Well-dressed men and women of high social standing will never appear in paintings in the act of taking a bite or chewing. Ken Albala (2007: 8) brings a quote from Ottavio Rabasco's *Il convito* of 1615 that may relate to this conception: a civil man “does not devour like the wolf, nor does he chomp vigorously like a goat, nor gnaw on bones like a dog.” In paintings, those of high standing will hold a glass of wine, a knife, or a napkin.

How should we study the cultural dynamics of dinner through a quantitative analysis? The distributional hypothesis of language (Harris 1954) suggests that words sharing the same context share some kind of semantic similarity or relatedness. Following this hypothesis, which has proved to be extremely helpful in automatic language analysis, we have decided to identify the words, more specifically the nouns, that exist in the context of dinner. The decision to choose nouns only is justified by our attempt to build an objects-based representation of Dinner. As the nouns that exist in the lexical surrounding of a target word are indicative of the “topic” (Turney 2012), we started our analysis simply by identifying the collocations of “Dinner.”

## 2 Methodology

Following the distributional hypothesis of language, we have identified in the Corpus of Historical American English (COHA) the lemmas of nouns collocated with Dinner in a window of plus/minus 9 lexical units. This means that we look at a window of nine lexical units to the right and to the left of our target word. The collocations were filtered and following COHA's norms, only collocations with a minimum Mutual Information equal to or higher than 3 were selected. This filter assures that the collocations are statistically significant. The 38 most frequent collocations have been selected for further analysis as these words have values for at least 10 data points over the time series, the minimal number of data points we needed for our analysis.

We have identified these collocations in 20 equally distributed time points (1810–2000) and measured their relative frequency in the whole population

of words (words per million). For instance, the words “table,” “evening,” and “guest” were the words most frequently collocated with DINNER.

## 2.1 Understanding the dynamics of dinner

Following Valsiner and Rudolph (2008) and their emphasis on studying the dynamics of cultural psychological concepts specifically from a Gestalt or holistic perspective, we first analyzed the dynamics of terms associated with Dinner. However, in contrast with a simple analysis that may describe the dynamics of each and every term, we have chosen to focus on the Gestalt or pattern of the concepts’ mutual appearance across the years. Therefore, we have used Recurrence Analysis (RQA) and more specifically analyzed the joint recurrence (Marwan et al. 2007) of the time series of the different words.

A recurrence plot (RP) is a method of nonlinear data analysis for the investigation of dynamical systems. The basic logic behind RPs is of characterizing the dynamics of repetition, which is of great interest in the continental philosophy (Deleuze 1995). This dynamics may result in informative value and a unique “fingerprint” of the system.

An RP is a binary matrix with entries for all such time pairs expressing recurring states, i.e., if a state at time  $i$  recurs at time  $j$  we have  $R(i,j) = 1$ . The fraction of recurrences in the RP (the recurrence rate RR) corresponds to the probability that the system reverts to a former state:  $p = \sum_{\{i,j\}} R_{\{i,j\}}$ .

A joint recurrence plot (JRP) is an extension of an RP in order to study simultaneous recurrence of states of two dynamical systems. A JRP is the element-wise product of the two RPs of the single systems. The recurrence rate JRR of the JRP is an estimate of the average probability of simultaneous recurrence in the two systems. If the two systems are independent, then this JRR is simply the product of the RR of the two single RPs. If, however, both systems have the same recurrence structure (as for generalized synchronization), JRR will be equal to the RR of the single systems (Marwan et al. 2006). Therefore, the ratio JRR/RR is a measure for coupling. In order to consider only the significant couplings, we combine the joint recurrence analysis with a bootstrap test and report only statistically significant results.

In our case, the percent of words along the 200 years can be considered as a dynamical system and JRR can be used to measure the degree to which two words have a similar pattern over the years. Therefore, it is a way of measuring the words’ coupling or synchronization.

As we wanted to avoid the analysis of simple linear correlation between the words’ appearance, our results present pairs of words where their dynamics is

synchronized along the years but no simple linear correlation was found between their appearances.

Appendix 1 presents the list of words included in our analysis followed by the words in which a statistically significant form of repetition/synchronization was found.

## 2.2 From dynamics to the social representation of dinner

The list described in Appendix 1 does not allow us to grasp the full meaning of dinner as a holistic social representation (Rudolph and Valsiner 2012). To gain a better Gestalt form of understanding of these couplings, we have built a directed graph out of the coupled words by drawing directed edges from each word to all of the words that synchronize with it. A picture of the graph appears in Figure 1.

To gain a better understanding of the graph we have used the *Number of Connected Edges* of each word/node in the graph and arranged the nodes in a five-layer hierarchy according to this centrality index (see Figure 2).

At the top of the hierarchy we find the word “Soup.” The second hierarchy includes: “Guest” and “Gong,” and at the third layer we get the following words in a descending order of importance where the numbers in the brackets indicate the normalized number of connected edges: thanksgiving (0.69), jacket (0.69), menu (0.62), dessert (0.62), beef (0.62), table (0.56), restaurant (0.50), and salad (0.50).

These results are far from intuitive or trivial. While “table” is the most salient noun associated with dinner in the corpus, when analyzing the dynamics of dinner-associated-words through two hundred years we find that *Soup* is the most central word!

This is a surprising result as even among food components soup is not “quantitatively” salient. The probability of getting the word Wine given the word Dinner is four times higher than the probability of getting Soup given Dinner (0.004 versus 0.001, respectively). Even the probability of getting Steak given Dinner is higher than getting Soup given Dinner. The next section is an attempt to interpret the significance of “soup” in the dynamics of dinner.

## 2.3 Soup and restaurant

From the beginning of human history there were always places where a man could eat, rest, sleep, and replace his horses. For those who were out of their homes and on the way, there were stalls of food waiting on the main roads. All

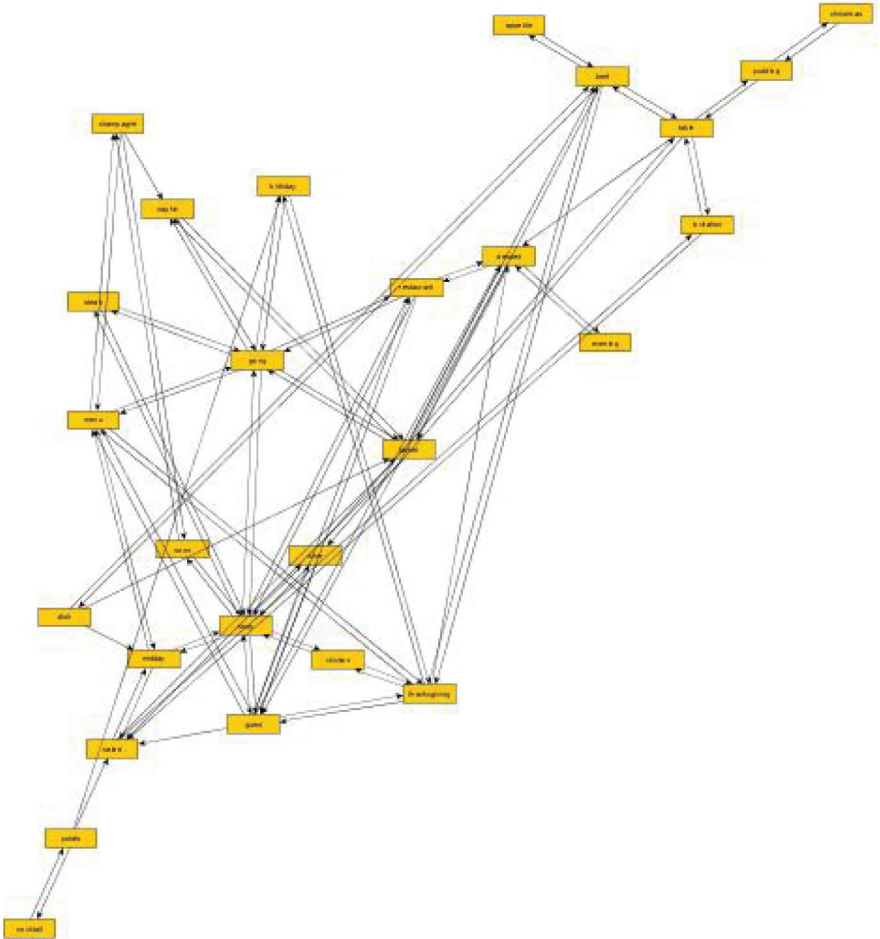


Fig. 1: A graph of the coupled words.

nations have food stalls to this day. In towns there were always places that served meals, mainly those establishments that specialized in alcoholic beverages. Inns, taverns, pubs, bodegas, *weinstuben*, and *brauereien*, to name only a few, were very popular institutions populated by members of the lower class. In this respect eighteenth-century London was different because there were respectable taverns there for the upper middle class and aristocracy. In eighteenth-century France the inn had a terrible reputation for bad food. He who wanted something to eat was offered the one dish that was served. Food was optional all day long. Another kind of forerunner of the restaurant was the *table d'hôte*, which comes from

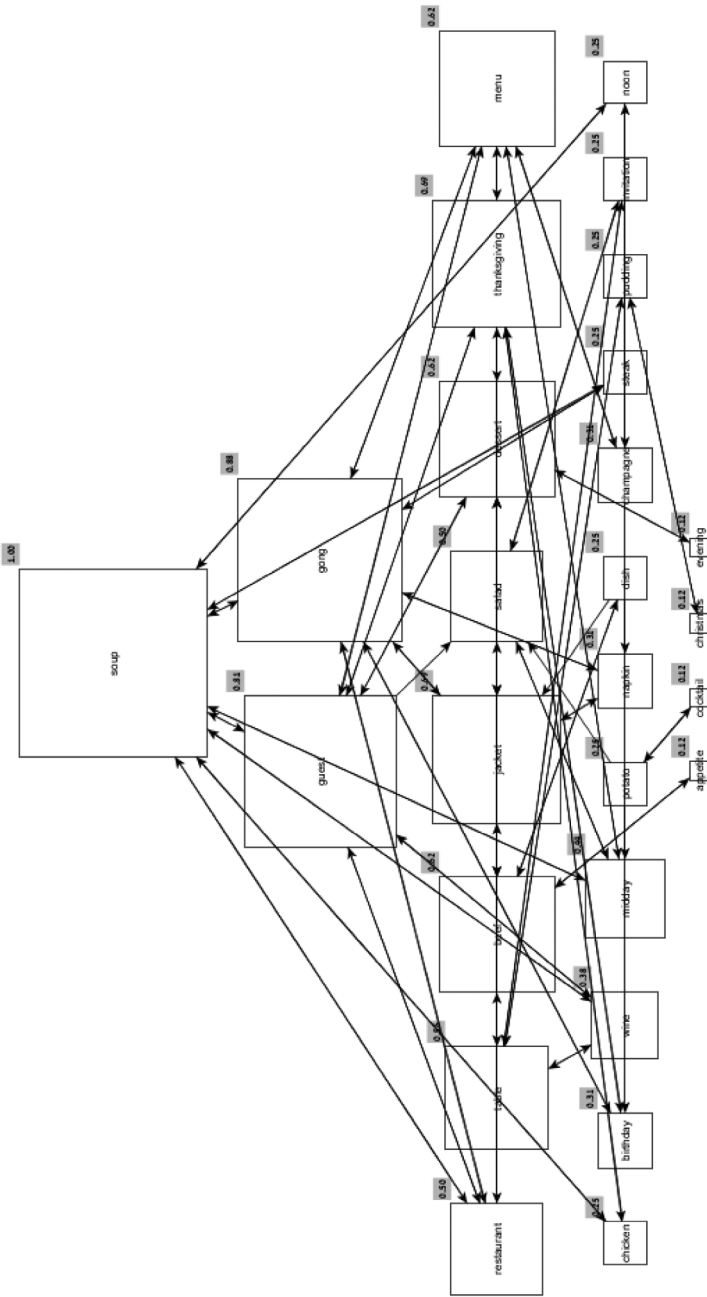


Fig. 2: The graph organized according to the nodes' number of connected edges.



French and means guest table. It served different kinds of courses but at a fixed hour. The guest paid in advance and could eat as much as he wanted (Ketcham Wheaton 1983: 75–76). Restaurants as we know them today exist only from the second half of the eighteenth century. The restaurant was invented in Paris by Boulanger, known also as Champ d’Oiseaux; the word means to restore. He began by selling meat *soups* (bouillons). Later he added other kinds of meat such as mutton. Didrot complemented his food: “I left to have dinner with the restaurateur on the rue des Poulies. One eats well there but pays dearly for the service” (Pitte 1999: 474). A famous eighteenth century restaurant opened in 1786 in Paris – Les Trois Freres Provencaux. This restaurant was very well known for its fish soup (bouillabaisse). Therefore, soup has been a first food and acquired precedence over other meal ingredients. From a network perspective (Barabasi 2003), this precedence is of high significance as it increases the probability that the node in the network will acquire the status of a Hub – a well-connected node – precisely as revealed in our analysis. However, an etymological analysis of soup (<http://www.etymonline.com/>) reveals another layer of its cultural significance.

The term soup originated in 1650 from French “soupe,” which originated from Late Latin “bread soaked in broth,” which in itself emerged from a Germanic source that means “to take liquid.” Soup is therefore not only a food that has precedence in the culinary history of Europe, but a food associated with a symbolically loaded food – Bread – and its association with symbolic redundancy. The broth is “Hot” (the adjective mostly associated with “Soup” in our corpus) and enriches the bread with taste, nutrition, and positive associations (i.e., Hot). This redundancy is of significant importance and it is an additional aspect that separates the soup from other dinner-related ingredients such as “Wine,” while as the same time points at the cultural semiotic significant of dinner as a presentation of wealth (i.e., redundancy) for the establishment of social power. The “redundancy” of soup is further interpreted in the next section.

### 3 The surplus of soup: Integrative semiotic analysis and discussion

The term “surplus value” is well associated with Marx who used this term to denote the value created by workers in excess of their own labor-cost. It is actually the “redundancy” created by the workers. In Information Theory redundancy is a term used to denote the “number of bits used to transmit a message minus the number of bits of actual information in the message” (Wikipedia). The surplus or

redundancy is interpretable by Gregory Bateson as meaning. Bateson (2000: 30) equates redundancy with meaning: “Meaning” may be regarded as an approximate synonym of pattern, redundancy, information, and “restraint.” Bateson further discussed meaning and redundancy in the sense of a patterning (2000: 420) through which uncertainty is reduced. The idea of linking “meaning,” “redundancy,” and “patterning” is specifically interesting.

To understand this linking let us move to Saussure (1972) who equated meaning with value. A value involves: “(1) something *dissimilar* which can be exchanged for the item whose value is under consideration, and (2) *similar* things which can be *compared* with the item whose value is under consideration” (1972: 113). For example, money is an abstract system of signs/values. In this system, like in the linguistic system, a one-dollar bill has no meaning in itself. The meaning of a one-dollar bill can be determined only in a closed system of values. To determine the value of \$1 we should know that a one-dollar bill can be exchanged for something different (e.g., a candy bar), and that its value can be compared to another value within the same system of currency (e.g., exchanging it for Euros). The language system is a system of pure values whose function is to combine the two orders of difference – phonic and conceptual – in the making of signs.

In *Capital*, Marx has identified the “exchange of equivalents” as the “immanent” law of exchange. As suggested by Goux (1990: 9): “Metaphors, symptoms, signs, representations: it is always through replacement that values are created.” As a sign is arbitrarily associated with the signified, the floating nature of value in its semiotic sense is inevitable. Value is implied in every replacement and therefore constituted by circulation. The semiotic system may be also considered as an autocatalytic system. “An autocatalytic set is a collection of entities, each of which can be created catalytically by other entities within the set, such that as a whole, the set is able to catalyze its own production” (Wikipedia). In this context, and under certain circumstances, value may “naturally” produce added value. A repressed sexual drive, for instance, may be replaced by a symptom. The symptom may generate interpretation, A Freudian interpretation, for example, that may circulate as a cultural coin.

How can surplus value be created in a semiotic system of exchange and replacement? Our suggestion is that redundancy/surplus is produced when a signifier exceeds the limits of signification within a given system of exchange. Let us illustrate this point. Let us assume that in an imaginary society a person earns 100 coins per day. For simplicity let us also assume that he is a Robinson Crusoe kind of person who is not supported by others or has to support others. Fifty coins are used by our solitary figure to satisfy his basic needs, those that might result in death unless satisfied. The rest of the money has no clear signifier. The man is satisfied and therefore the money remaining in his pocket has no clear refer-

ence, neither food nor drink, for which it can be exchanged. In this imaginary case, surplus seems like the redundancy discussed by information theory, a useless appendix that should be removed. However, as insightfully realized by Marx and elaborated by Goux, it is precisely this surplus that is responsible for the dynamic circulation of value.

The analogy we draw between money and language is deeply grounded in the European discourse. As argued by Gray (1996: 1): “The metaphorical field circumscribing analogies between language and money is undoubtedly one of the most productive in all Western culture.” In fact, it is not a mere analogy but rather “a deep-seated isomorphism between the domains of money and language.”

The isomorphism can be explained by the deep-seated nature of the semiotic system and its phase transition in the eighteenth century in Europe where the de-substantiation of value has become more radical than ever.

As argued by Goux (1997: 172), “What matters is not what the value of some share ‘really’ is, at a certain moment, but what its value is going to be, later . . . What the dealer desires is not to own, but to ‘make a difference.’ The whole game unfolds in the difference between value at time ( $t$ ) and value at time ( $t'$ ).”

Goux points out that the value originally associated with concrete goods has turned into a “difference that makes a difference,” which is precisely Bateson’s definition of information!

The value’s fluctuating nature could have not emerged without a surplus or redundant meaning having no simple system of equivalents. That the nature of value has changed during the eighteenth century through the logic of surplus into a floating signifier bring us back to our soup.

Originally the soup was a symbolically loaded food (i.e., bread) soaked with enriching liquid. Bread of course has a loaded symbolic history specifically for Christian Europe (Galavaris 1970) as illustrated by its major part in the Last Supper and in the two feeding miracles with loaves and fishes. In fact, the last supper was probably conducted along the manners of the Jewish religious tradition (Galavaris 1970). After all, Jesus was born, lived, and died as a Jew. According to this tradition the main course began with blessing God for providing the bread, a custom every religious Jew still follows. Jesus’ alleged use of the bread as symbolizing his body and therefore the son’s body constituted the Eucharist. From a psychological point of view, the sharing of the symbolic body by the father is of great importance. Years later another radical Jew by the name of Sigmund Freud developed a theory about the origins of the human culture by inventing a mythological psychological story about the ancient father who was murdered (and probably consumed) by his naughty sons. The symbolic act of consuming your dead father is therefore of great significance to cultural psychologists. The bread

therefore symbolized the flesh of the father and his materialization in the son. In fact, the modern slang associating bread with money preserves this deep-seated semiotic chain associating the corpus of the consumed father with the semiotic object epitomizing surplus. Money is therefore embedded in the body and mediated through the semiosis of bread.

Around 1850 in France bread was eaten at all meals and in all forms (Drouard 2007: 285). It was the main food of the farmer. The fact that bread was enriched with liquid, which in itself has not substantive value (the liquid itself is not really food), turns the soup into a representative of the floating value; the bread-body enriched with surplus-soul. In contrast with wine or a steak, which have value but no clear redundancy, soup is by historical definition a value-laden food.

Here lies the explanation of why soup has turned into the first kind of food to be served to the higher class. To recall, dining, in contrast with eating, is a symbolically loaded activity and a display window of wealth (i.e., surplus value) functionally used to impress the others and to constitute social status. In this context, the *Tertium comparationis* underlying soup and money is the surplus of meaning associated with the basic good. The eighteenth century upper class was actually epitomizing the new zeitgeist of its time, a zeitgeist that echoes through the next two hundred years of textual history. Only through the non-linear analysis we have used in this study could such a complex dynamic have been rigorously elucidated.

Rudolph and Valsiner (2012) ask “What kind of mathematics is appropriate to use in modeling complex dynamical wholes?” Their discussion emphasizes the holistic, Gestalt notion, of psychological wholes and their dynamic nature. Dinner as a situation is a Gestalt that has been transformed over the years. By identifying the non-linear coupling of Dinner’s collocated objects we have studied the way dinner, as a Gestalt, has been transformed yet preserves its structure by moving in a psychological phase space (Valsiner and Rudolph 2008) of the studied culture. Moreover, by weaving Dinner’s coupled objects into a network we were able to identify Soup as a major component and to delve into its symbolic value.

## Appendix 1

1. TABLE; WINE; INVITATION; BEEF; DESSERT; PUDDING
2. EVENING; DESSERT
3. GUEST; RESTAURANT; WINE; THANKSGIVING; SOUP; MENU; DESSERT; SALAD
4. RESTAURANT; GUEST; SOUP; DESSERT; GONG

5. WINE; TABLE; GUEST; SOUP
6. CHRISTMAS; PUDDING
7. JACKET; BEEF; DESSERT; SALAD; NAPKIN; GONG
8. INVITATION; TABLE; SALAD
9. DISH; JACKET; BEEF; MIDDAY
10. CHICKEN; THANKSGIVING; SOUP
11. THANKSGIVING; GUEST; CHICKEN; MENU; BIRTHDAY; BEEF; DESSERT
12. NOON; SOUP; CHAMPAGNE
13. POTATO; COCKTAIL; BIRTHDAY; SALAD
14. COCKTAIL; POTATO
15. SOUP; GUEST; RESTAURANT; WINE; CHICKEN; NOON; STEAK; MIDDAY; GONG
16. MENU; GUEST; THANKSGIVING; CHAMPAGNE; MIDDAY; GONG
17. BIRTHDAY; THANKSGIVING; GONG
18. STEAK; SOUP; GONG
19. APPETITE; BEEF
20. BEEF; TABLE; JACKET; DISH; THANKSGIVING; APPETITE
21. DESSERT; EVENING; GUEST; RESTAURANT; JACKET
22. CHAMPAGNE; NOON; MENU; NAPKIN
23. SALAD; JACKET; INVITATION; MIDDAY
24. MIDDAY; SOUP; MENU; SALAD
25. NAPKIN; JACKET; GONG
26. GONG; RESTAURANT; JACKET; SOUP; MENU; BIRTHDAY; STEAK; NAPKIN
27. PUDDING; TABLE; CHRISTMAS

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