International Journal of Social Science and Business, Vol. 8 No 1; April 2024
ISSN: 2519-9161(Online), ISSN: 2519-9153(Print)
Published by Center for Academic Research (CAR)

Surveying Title IX Concepts: Proof of Concept Analysis Using a Neural Network

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Abstract

Title IX coordinators are uneasy about the work of Title IX. The findings presented display an unexpected lack of consensus about the Title IX concepts which were explored. The lack of consensus very likely represents the uneasiness they feel. However, the research presented here is proof of concept that the Title IX Coordinators' thinking using interviews to generate a text file for analysis can provide survey-like information. The resulting concepts are necessary to create a multidimensional map to chart a clearer path to Title IX's potential. The text file analysis results are shown in dendrograms revealing patterns of words, which are neurons firing together. Those neuron patterns are the necessary visual representation needed to proceed to a map. The map presents a representation of neurons developed by proof of concept approach used. The map then leads to messages to improve Title IX coordinators sexual assault prevention training messaging.

Key Words: Title IX, Title IX Coordinators, Galileo Theory, Mental Maps, Dendrograms, Text File

1. Introduction

1.1. Title IX has been law since 1972 with the purpose of ushering in equal access to any education program and activity receiving federal money. The act has been amended a number of times over its 50+ years of existence. Title IX work led by Title IX Coordinators, their deputies, and others involved in Title IX on college and university campuses are responsible for Title IX investigations, hearings, counseling, prevention training, and related activities. They are subjects implementation. Furthermore, the literature is not clear on whether or not Title IX works at all. In fact, Jennifer M. Gomez, writing in the journal Violence Against Women, asserts college women experience higher rates of sexual assault on campus since Title IX's implementation. Therefore, these women are subject to what she calls "institutional betrayal; or more to the point, actions which do not help the victim and in some ways harms the student further (Gomez, 2023). Similarly, the Rape, Abuse, and Incest Network (RAINN) notes "sexual violence on campus is pervasive", in spite of Title IX protections. RAINN goes on to state that 13% of ALL college students suffer sexual violence in one form or another. Undergraduate and graduate students alike experience sexual violence. The United States Drug Enforcement Administration affirms the RIANN information.
1.2. Title IX has not created hoped for results, as these data show. Catherine Silbaugh (2023) points out that colleges and universities face legal and regulatory repercussions if they do not respond to an assault but no such repercussions result from not reducing the crime. She calls for more or, at least, more focused prevention training but she also notes there are cultural and social barriers which must be overcome in doing so, which may explain some of the findings from evaluations of Title IX training on campuses

2. Title IX Sexual Assault Prevention Literature

2.1. Budd (2019) and colleagues studied patterns of sexual assault on campuses. They report that on campuses, men "lag" behind women in terms of the victimization numbers. These numbers arise from the reporting process of sexual assault such as that studied by Marcantonio, Hunt, and Schisler (2023). They note there are barriers to reporting such as fearing retaliation, thinking nothing serious happened, and not being fully informed about the reporting process. Colleges and universities have reacted to these kinds of situations with more policies and procedures concerning reporting. Bedera (2022) says the result of these policies is that reporting has not been the proactive approach Title IX expansion was intended for. Though federally mandated, protection, reporting, and training have not generated results. In fact, Bedera writes colleges and universities have stronger incentives to maintain the status quo; because, she says sexual violence investigations are disruptive. They bring unwanted attention to the campus which can imperil alumni support and donations!

2.2. Title IX was originally supposed to safeguard female athletes but later expanded coverage through amendments extended coverage of Title IX to females in the student bodies of colleges and universities. Colleges and universities are now required to take prompt and fair or equitable action to help sexual assault victims which produces the disruption Bedera describes. One of the intended outcomes of the actions taken in a sexual violence investigation is to allow the student to benefit as fully as possible from the educational institutions' educational programs. One-way colleges and universities have approached this area of Title IX work is to establish sexual assault prevention programs on their campuses. While mandated to do training, much of it turns out to be "check the box" training according to Bedera (2022). More importantly, since the training is often "check the box", it does not take into consideration the way males and females learn; they learn differently according to Worthen and Wallace (2021). Men, they say, are delivered training to reduce the likelihood they will commit an assault while women are delivered training to avoid becoming a victim. As a result, the standard approach or "check the box" training falls short of desired results in learning.

2.3. Sexual assault prevention programs have been subjected to numerous evaluations which have shown limited or mixed results for the most part. Chambers, et. al., (2021) note many studies have shown even changing the delivery method of the training does not produce recognizable differences in results and they cite multiple sources on the point. Blanchard (2018) is cited by Chambers, et. al., concerning training and policies not "ameliorate [ing]" the problem of sexual assault on campuses. Terman (2022) draws on Baldwin who asserted Title IX and Clery Training are no better than misdirected. Terman further found in her research using key informants, that there is a strong sentiment among them that results are elusive. Among the difficulties in delivering sexual violence prevention training is what Budd and Frye (2023; p. Conclusions) call a "long standing problem on college campuses": social and cultural roots influencing behavior. Given these factors the standard or "check the box" kind of training is certainly never going to deliver needed results. Tinkler (2013) goes even further when he writes sexual harassment training done badly can even make things worse. That kind of training can intensify sexist attitudes leading to social conditions which can foster sexual harassment.

2.4. Azimi, et. al, (2021, p. 46) write that "simply being exposed to prevention programming does not mean that it will translate into intervention behavior – and in fact makes it less likely the individual will intervene under certain conditions". They further note sexual violence and its prevention should be delivered as part of the Title IX training content from application to admissions, to counseling, to financial assistance, and to other college and university functions; not just to students and faculty. The omission of such information is what they term a "weakness" in the training.

2.5. Katie M. Edwards, et. al, published research about sexual assault prevention programs. Their article is entitled "Measurement Tools to Assess Relationship Abuse and Sexual Assault Prevention Program Effectiveness Among Youth". Their tools are to be used for evaluating Sexual Assault Prevention Programs. The tools date from 2018 and seem not to have been widely adopted; thus creating, a greater weakness in training content, further allowing bad training and its consequences to continue.

2.6. An article written Adrienne Baldwin-White and Karen Moses entitled "A Multisession Evaluation of Sexual Assault Prevention Education: The Unique Effects of Program Participation" was aimed at examining the results of sexual assault training. The article was published in 2021. They found even among several programs with multi sessions, results were no better than "mixed". None of the programs evaluated produced higher scores on key tests and scales using a pretest/posttest approach.

2.7. Research concerning sexual assault prevention can be described as extensive and for good reason. It is more valuable to prevent violence or assault before they happen; thus the training for prevention. The search for prevention remains elusive. The evaluation findings appear to be less than favorable results from these training programs. In particular, Cruz references Richards (2019; p, 365) when writing that many institutions of higher education are not even in compliance with Title IX. Which, in turn, strongly suggests the Title IX training and its prevention elements are not present; confirming even more the missing potential Silbaugh writes about.

2.8. Given the social structure and cultural elements leading to or, at least, fostering a sexist campus environment and related cultural norms, there is a major threshold to what Title IX and its training can do as presently constituted. When bad training is combined with unhelpful institutional behavior, the outcome seems preordained. However, there is an approach which can pave a pathway to improved training and campus climate. The approach begins by recognizing that attitudes lead to behavior. If the behavior is sexual misconduct, as the literature clearly shows, there is a missing attitudinal component. Such being the case, an approach which begins with the thinking process is a very relevant area to form a pathway to improved training and prevention.

3. Mental Activity, Thinking, and Attitude Formation

3.1. The delivery of sexual assault prevention training under Title IX is a complex mental exercise. Each person exposed to the training brings with her/him/themselves a mental model of concepts formed from experiences, cultural messages, family relationships, and many other influences on their thinking. In consequence of that fact, the mental model of sexual assault topics/concepts mostly likely are present in a person's mind and cognition well prior to training. The concepts are formed in such a way as to create conceptual space that may not be easily transformed in a conventional way. The need is for conducive training lessons to be absorbed; training in any topic area, for that matter. This context must be approached also with the Worthen and Wallace insight into current training about males being "pitched" content on how not to be a perpetrator and women how not to be a victim. Recognizing mental models are already in place means beginning the effort to improve the saliency of prevention training lessons; plus messages to increase the dosage sexual violence prevention.

3.2. Pierce began working in the area of mental models in the late 19th century. His definition of "inwardness" is germane to the foundations of mental models. Pierce noted that a person's inwardness knows no boundaries or limits. In fact, he formulated the idea of inwardness (Semetsky; p. 365) which he postulated had expandable dimensions, particularly in cultural content. Others have followed with further research advancing the understanding of mental models (see Johnson-Laird, 2010). The expandability of the inwardness holds promise for using Galileo messages to enhance and improve sexual violence prevention.

3.3. The inwardness feature of mental models has a large influence on Galileo Theory used in the research reported below. The inwardness of Pierce is the self in Galileo. The self, according to Woelfel, is always present in the conceptual space of any individual. This phenomenon is in Galileo Theory because conceptual space with the individual in it is corporeal. Thus, thoughts are generated in a person's body and belong in that person's conceptual space form which a mental model is formed. As a result, the individual has a whole range of images, words, and memories by the time of college admission.

This understanding is fundamental to Galileo since, as Woelfel points out, Western Civilization has not fully accepted that thoughts are corporeal. The philosophical underpinning of this circumstance dates from as early as Aristotle but, again, according to Woelfel, continues today. Woelfel writes "Abstract, immaterial concepts have no "place," i.e., location, in Aristotle's world, which is still, for the most part, the cultural underpinning of contemporary Western civilization, hence space as such has little meaning in psychological or cultural processes" Woelfel, page 264, 2022). The point here is that among the influences on the mental model one accumulates, the thoughts one can become a self-justification for behavior on the order of: "the devil made me do it". Further, current training takes no account of this important theoretical underpinning. Current training assumes lesson absorption with presentation, visuals, and demonstrations.

3.4. The issue of concepts being corporeal means they belong to individual humans who form communities around such areas as Title IX and, resultantly, share conceptual space around Title IX, for instance. Thus, the space concepts occupy is subject to spatial locations; in mathematical terms, coordinates. Concepts can then be mapped in the conceptual space they occupy using coordinates. More, importantly in Galileo Theory, that space can have "vectors" in it. Vectors are lines with velocity, magnitude, and direction. Vectors can be plotted and vector coordinates can be used to determine distances within that space between and among concepts. Woelfel credits Young, Householder and Torgerson with developing the early scaling methods and mathematics to determine distances among concepts in the space of cognition or mental maps. (Woelfel 2022, page 265).

3.5. Given all of the foregoing, the Galileo mental map emerges from clusters of concepts found in the nodes of individual brains connected by synapses and formed into a community of nodal content, as it were, in the form of dendrograms. The connections are based on the Hebbian Rule that neurons that fire together wire together (Lagani, et.al., (2022, p. 6503). Donald Hebb (1951) developed the idea that the brain is equipped so all humans can learn and remember. Such learning is a base element of any single person's mental map.

With the neurons connected in this way, humans produce concepts in subsets as they experience the world around them. Correspondingly, these experiences are formed into neighborhoods, so to speak, of concepts constructed from experiences such as reading, watching TV, listening to music, traveling, using the internet, and others. Another term for neighborhoods is nodes. Since it is the individual's neighborhood, the corporeal thought of one's self in one's mind is present in all the neighborhoods formed by the neurons and the connecting synapses.

All of this structure among concepts in the mind lend themselves to understanding through Galileo analysis. Galileo analysis begins with understanding the neighborhoods of concepts shared by individuals based on a generally defined set of ideas formed into questions. Those questions are open ended and intended to generate a non-directed conversation formed as an interview. Those answers are the entryway into the conceptual shared space among those in the neighborhood. It is important to distinguish this approach from the more traditional statistical measurement used in much of social science. Importantly, as Woelfel points out, that research is based on Euclidean space not conceptual space. The distinction is important to understanding the analytic direction Galileo takes. For example, statistical procedures use least squares analysis using on 2-dimensional display of the "line of best fit". Such a straight line produces an error coefficient due to the flatness of the graph displaying the least squares result. The analysis is then subject to interpretation through the amount of error.

3.6. Galileo analysis begins finding a multi-dimensional space shared in a neighborhood by subjects of the analysis. Moreover, that space is not treated statistically. Galileo space is determined by distance based on similarity of concepts with no distance being too large or formed into 1 to 5 categories or 1 to 7 or even to 1 to 11. Galileo Theory postulates having a 1 to 5 or 1 to 11 response set makes the data accumulate at the extreme of the numerical sequence of choices. Thus, the last available response category limits the data and its information content.

Once the open-ended questions' answers are transcribed, the Galileo Catpac analysis can begin. The Catpac analysis uses a neural network to sort through the transcribed answers seeking patterns within the questions' responses and across the questions' answers. Once that process is completed, dendrograms are produced; one for each of the open-ended questions. In the research reported here there were 5 questions employed. Galileo Theory and Method are based on clarity of seeing the concepts. Thus, the number of open-ended questions is 5 to 7 questions. In this case, 5 was thought to be the best number to use for clarity of findings.

The questions were:

1) When you first became involved in Title IX work, what were the results you were expecting to see?
   Prompt Question: What brought you to the work?
2) What principles do you think should be present in Title IX Sexual Assault Prevention training?
   Prompt Question: What do you think is missing?
3) What do you think are the reasons Sexual Assault Prevention trainings have traditionally shown limited or mixed results?
4) What training or expertise should a Title IX trainer have?
5) What do you think is the future of Title IX Sexual Assault Prevention training?
   Are there any final thoughts before we conclude?

The questions and the prompts are intentionally broad in order to elicit replies generated by the thinking the interviewee is doing. That thinking is the location of the community or neighborhood. Each question produces a community or neighborhood node. This neighborhood is the Hebbian neurons firing and then wiring together.

3.7. The Galileo nodes can be developed by communications about and for Title IX from government sources, from online magazines, from Title IX training, from Title IX professional associations, and, certainly, from one Title IX professional to another. Information from these sources is the result of developing Title IX ideas or concepts evolving from interaction among Title IX professionals and working in the Title IX information domain. The approach taken for the source text on Title IX conceptual nodes in Galileo terms, was transcription of interviews of Title IX coordinators, deputy coordinators, and women's centers directors on college campuses. The transcribed interviews, without attribution, were then submitted to Galileo's CATpac software for analysis by its neural network. The neural network generates dendrograms for each of the 5 questions. It also produces a word count of the most frequently occurring words.

The key informants are an important choice for this research, since Cruz (2021, p. 366) reports there is a paucity of research on Title IX Coordinators. As a result, this research will add significantly to the body of knowledge about Title IX, its training, and Title IX coordinators.

The analysis also included a split half analysis of Question 2. This step was taken to determine if the patterns found in the dendrograms were stable and, therefore, representative of the Galileo conceptual space.

4. Findings: Descriptive Information

4.1. The total number or N of the interviews was 103. The mean years of experience among the interviewees was 10.49 years, with a standard deviation of 7.18. The standard deviation means on average the ages are separated by just over 7 years. The mean age of the interviewees was 44.63 years of age with a standard deviation of 10.9. The age standard deviation indicates an average distance between ages was almost 11 years and, therefore, over a decade of difference. By far, the most common delivery method of training is hybrid or a combination of online and in person. Eighty- five (85) respondents said hybrid training was used. Eight coordinators reported online only and 8 were in person delivery. There was one case of missing data on all demographic items.

There is no Galileo geographic requirement in gathering text data from respondents. However, the researchers wished to be able to recruit participants by indicating their responses would be part of a nationwide research project. The number of unique states was 24.

5. Word Count and Dendograms

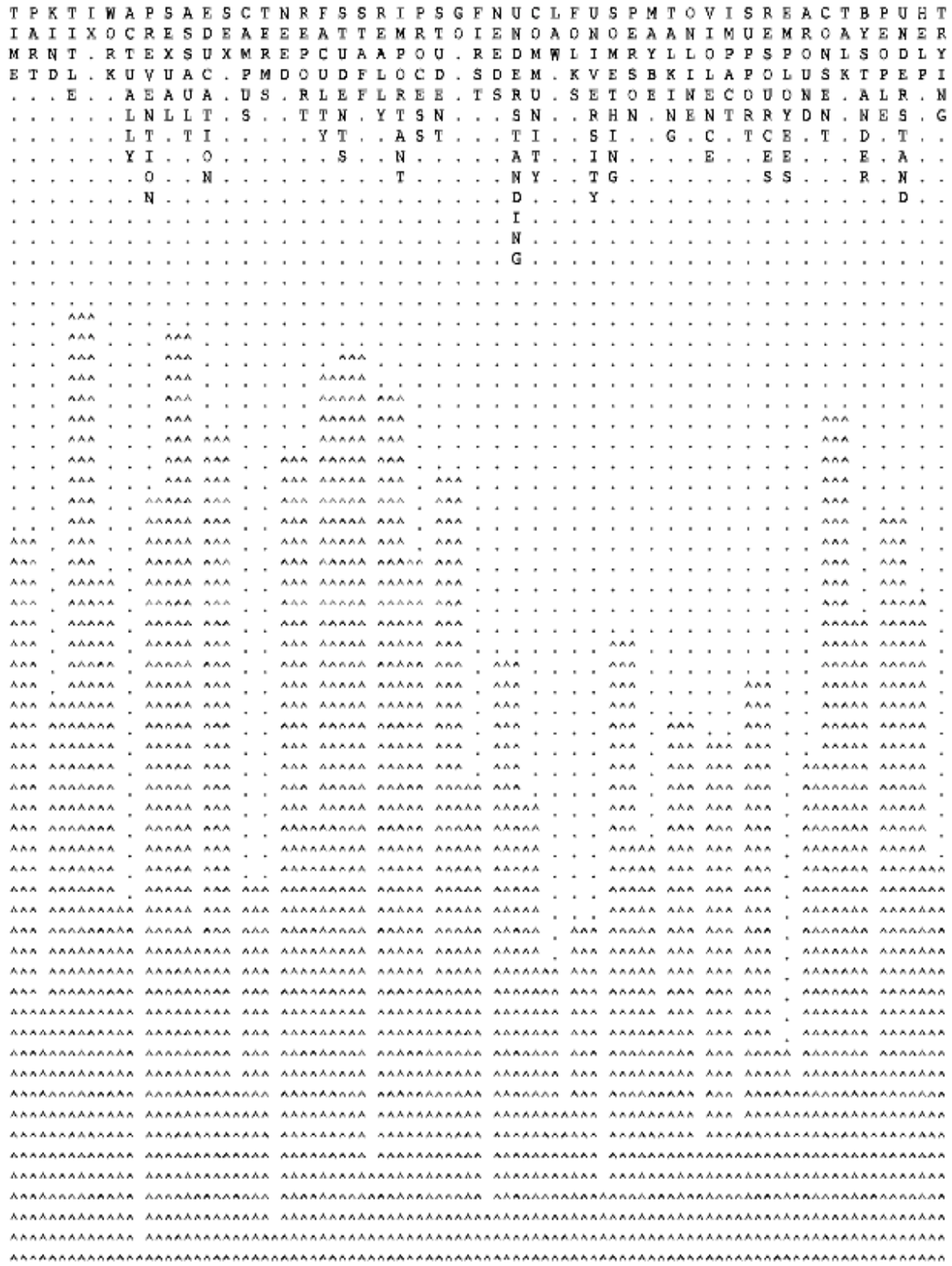
5.1. The total word count for the "raw corpus data" (Florea and Woelfel 2022, p. 364) was 13,620 for all 5 questions. The word count also represents neurons in each individual question node.

Before proceeding to the dendrogram analysis, the researchers performed a split-half procedure to determine if the patterns of concepts in the dendrograms had stabilized. In Galileo analysis stabilization occurs at approximately 50 respondents. The split-half procedure seeks to determine if the patterns in the 2 halves are similar. When there is representation of similar concepts, the node is beginning to stabilize and present the pattern of the most common words.

5.2. Question 2 was selected for a stability check in the patterns of the answers. The split half results indicate the neurons are firing together and becoming recognizable. The results are described and explained in Figure 1 for the Top Half of the 103 and Figure 1A for the Bottom Half of Question 2.

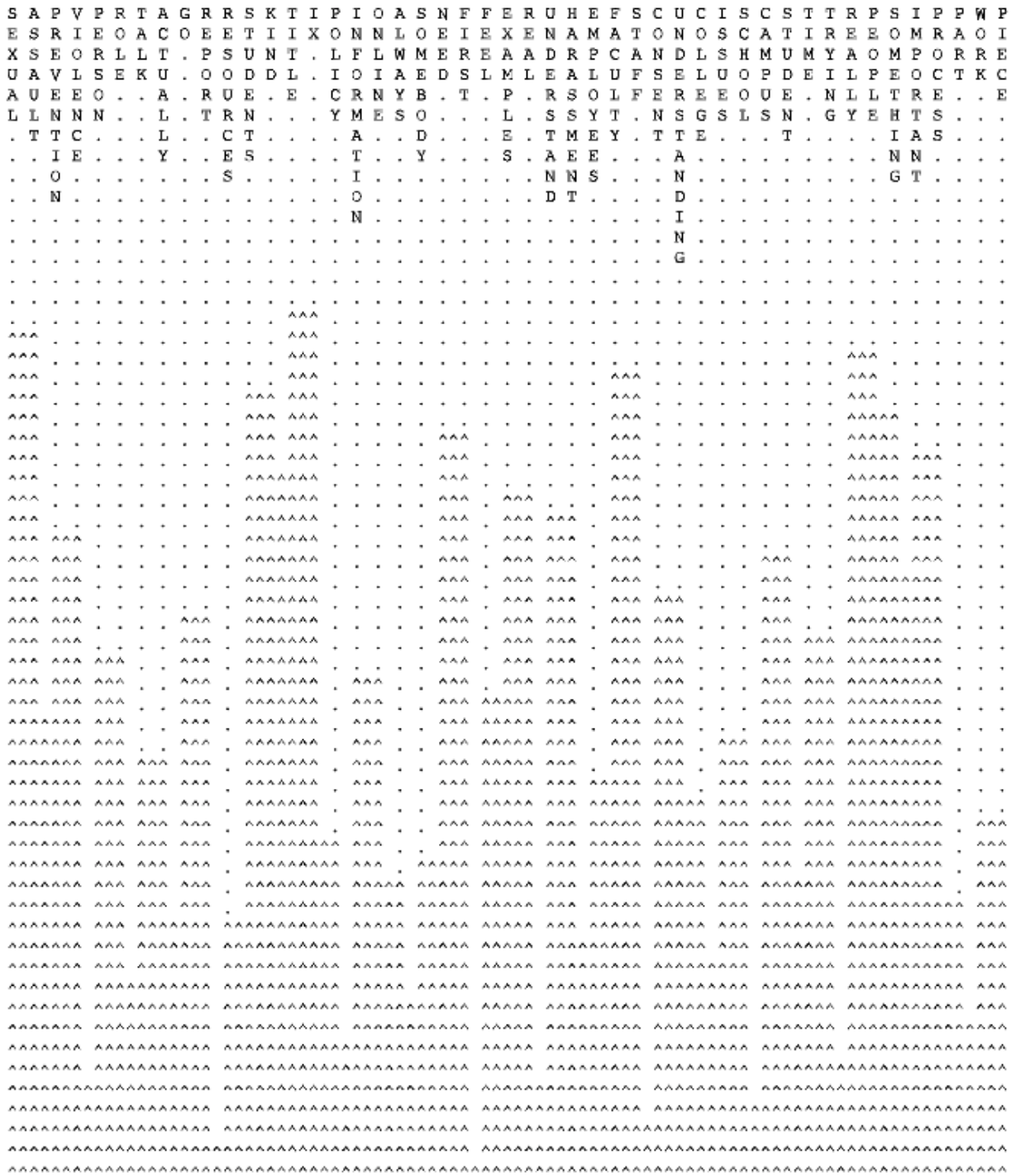
Question 2 concerned what topics, elements of the course on Title IX, and concepts and what was missing from the Title IX course. The stability is forming around SEXUAL ASSAULT, PROCESS, AND RESOURCES. Not surprisingly the Title IX concept is present. In the text file of the interviews there are statements about the Title IX training courses whether online, in-person, or hybrid. The fact that these concepts are in the course material means there is a common wiring together of them for the Title IX coordinators. These concepts are among the primary concerns in trying to implement Title IX training as reported by the Title IX professionals. Individuals attending the training must know about these topics and their definitions according to the coordinators. Notable in Figure 1 is the presence of the concept of PREVENTION but it is not the "taller" of the words in the dendrogram. Nonetheless, it is linked to SEXUAL ASSAULT and EDUCATION.

Figure 1 Top Half of Q2



The Bottom Half of Question 2 shows some similar concepts which include SEXUAL ASSAULT, RESOURCES, PROCESS, and CONSENT. PREVENTION is present and represented in the same way as in the Top Half of Question 2.

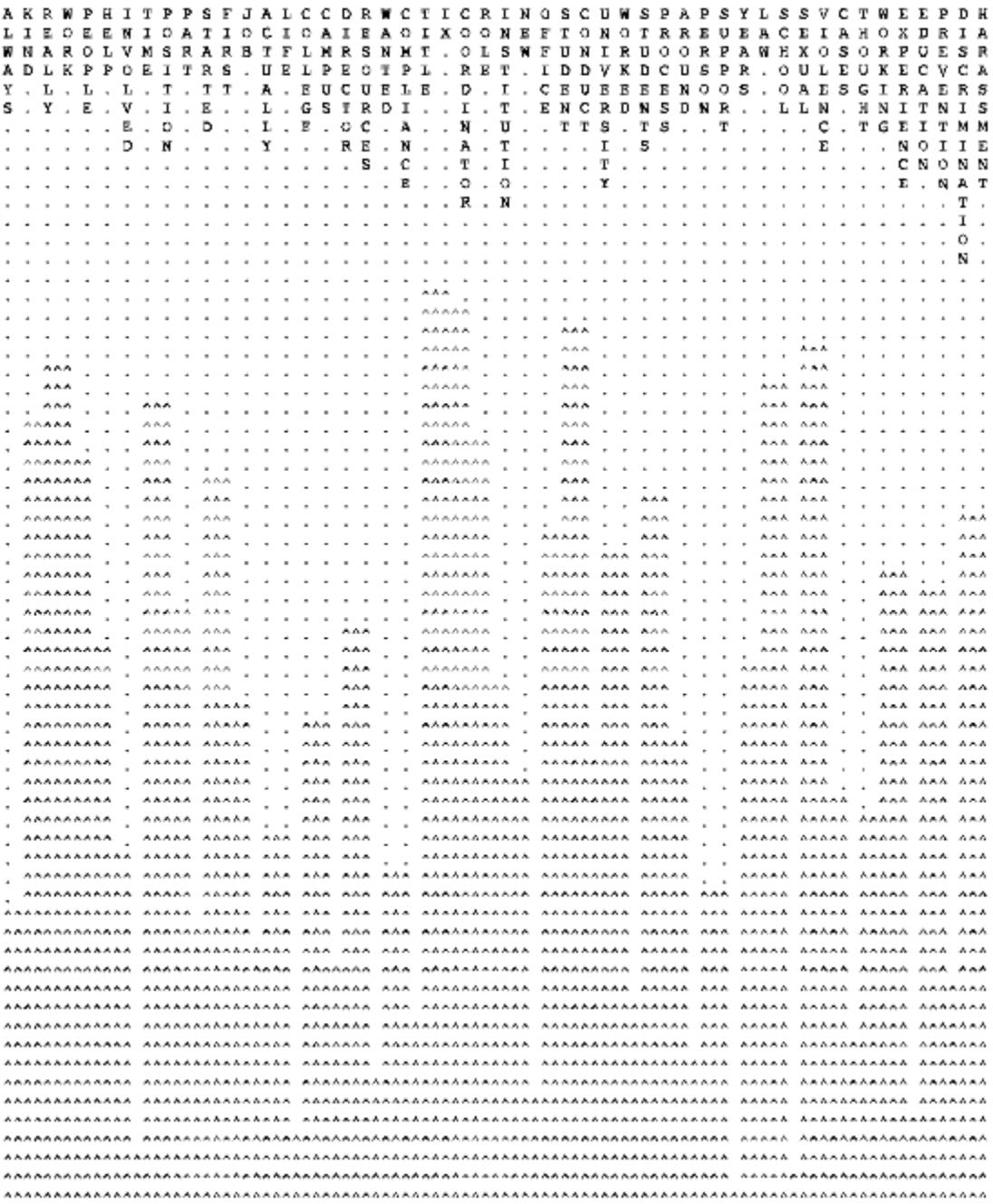
Figure 1A Bottom Half of Q2



The Bottom Half of Question 2 shows some similar concepts which include SEXUAL ASSAULT, RESOURCES, PROCESS. CONSENT is also present as it is in the Top Half of Question 2.

5.3. Question 1 is shown in dendrogram form in Figure 2. Question 1 asked about the interviewee's Title IX origin story and the prompt question was: what expectations, goals, hoped for outcomes, and or results for the Title IX work being undertaken did the key informant have when beginning Title IX work. The clustering concepts appear as HELP, INVOLVED, STUDENT CONDUCT, VIOLENCE, LAW, HARRASSMENT, DISCRIMINATION. There is recognizable clustering with SCHOOL and SEXUAL VIOLENCE.

Figure 2 Q1



Question 2, in full, is presented below as a dendrogram showing the clustering of concepts derived from the question's answer's. The question concerned the subject matter of the Title IX training; specifically, the most important topics. The second portion of the question asked what topics were missing in the training as currently composed. The clustering pattern shows the concepts of SEXUAL ASSAULT, EDUCATION, SEX, NEED, REPORT, FACULTY, STUDENT, CONSENT, BYSTANDER, and UNDERSTANDING. Noteworthy is the presence of COMMUNITY, indicating a firing within the node pointing to a larger sense of Title IX beyond the training.

Figure 3 Q2

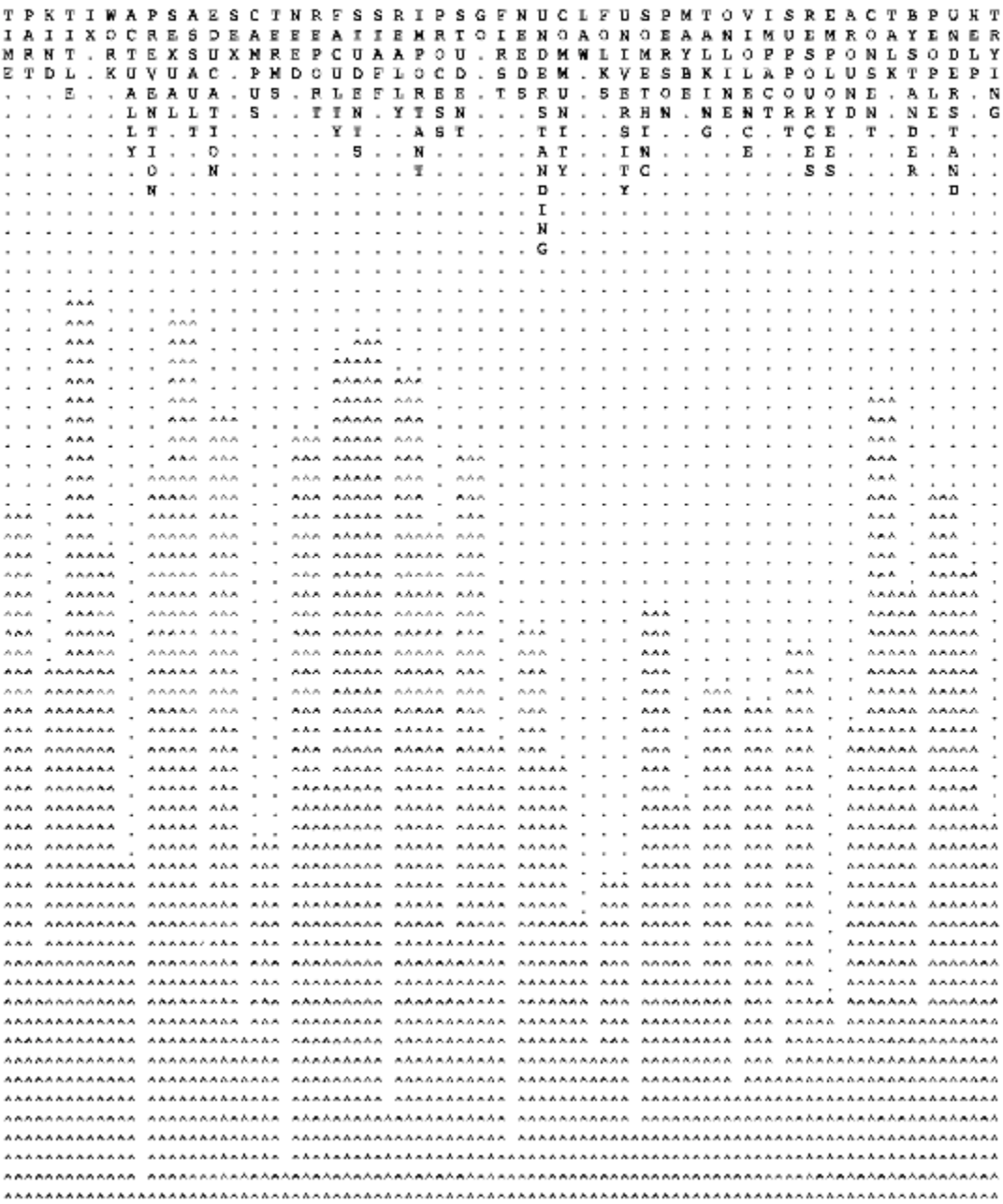
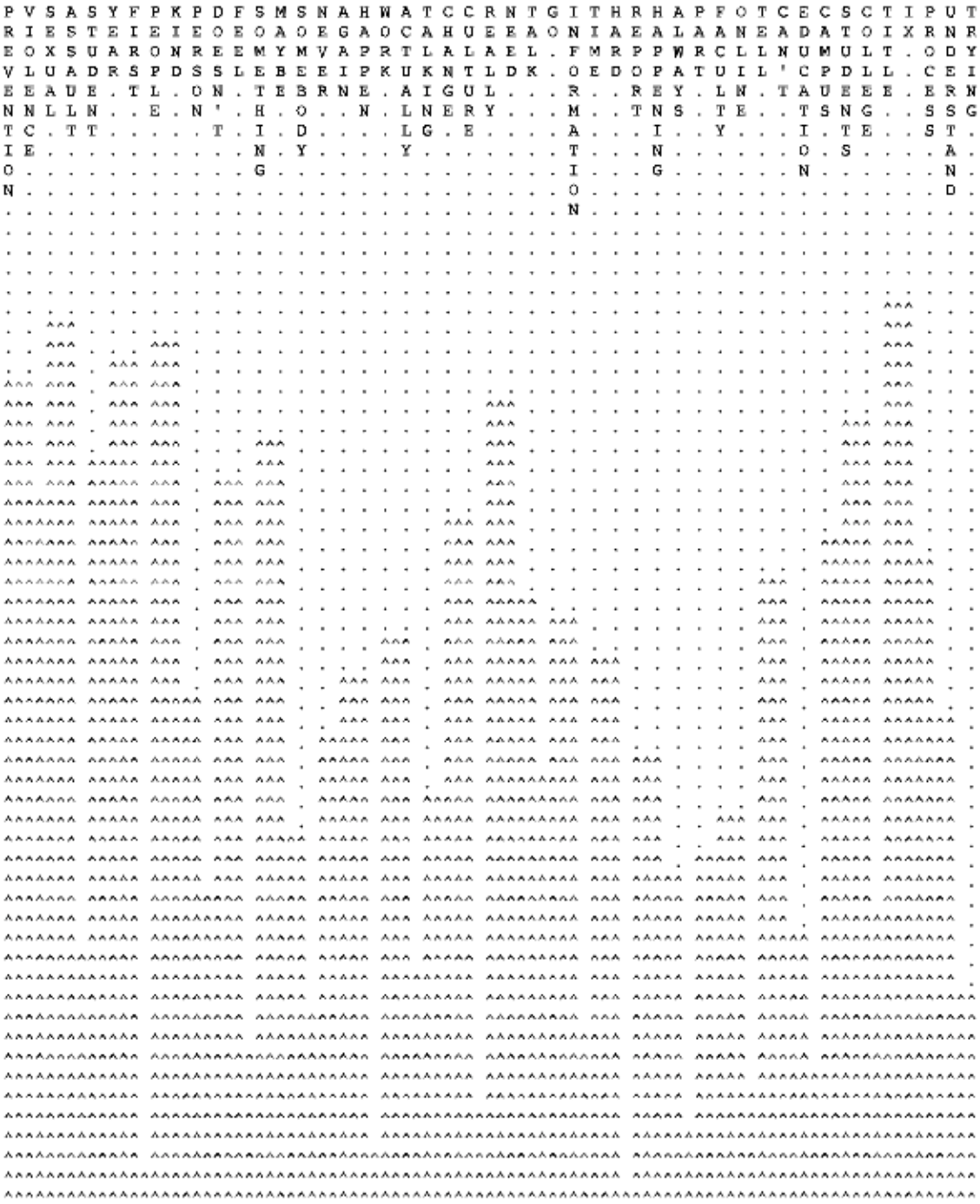
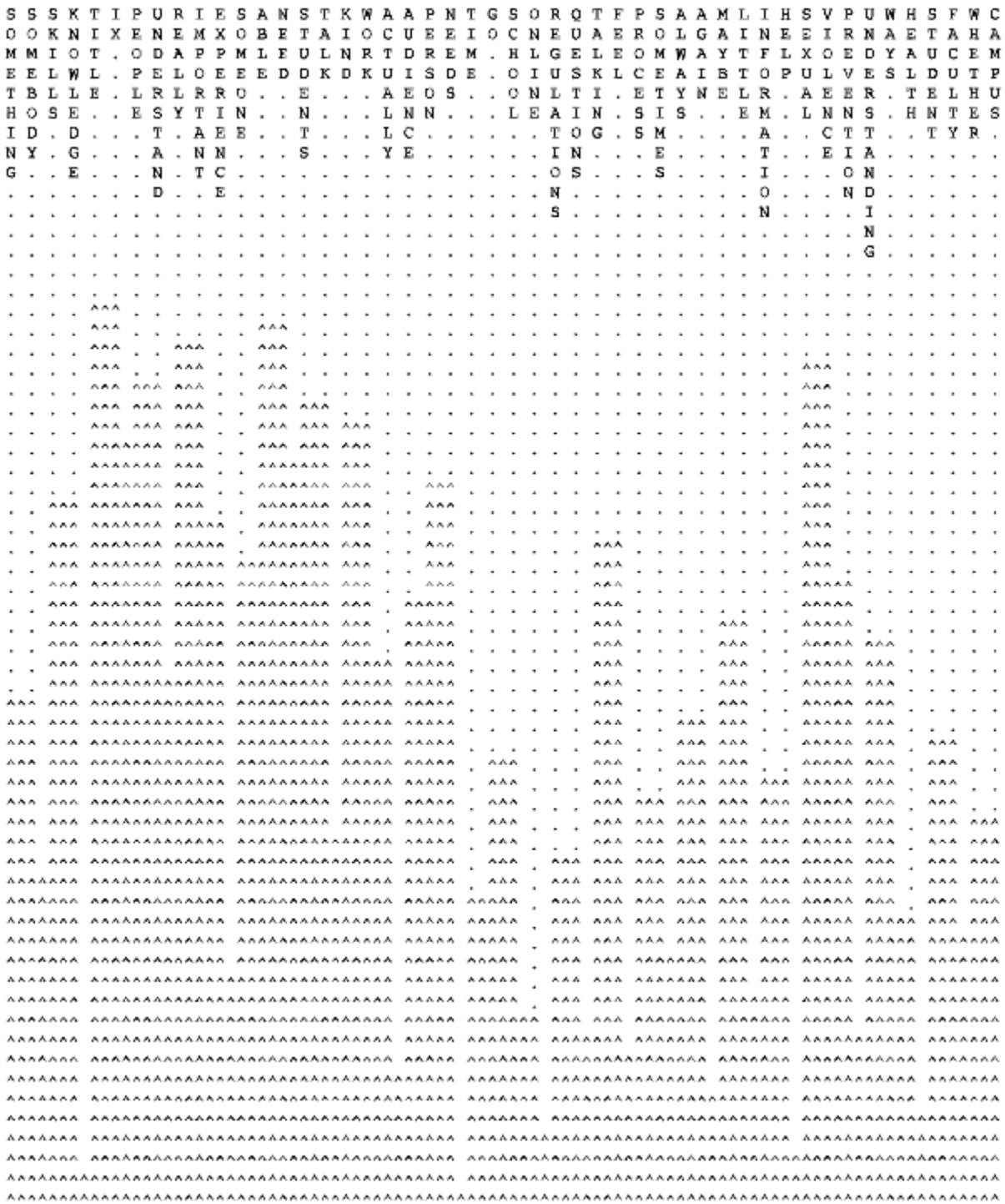


Figure 4 Q3



Question 3 was a broadly based question referencing the program evaluation literature on sexual assault prevention programs on college campuses. The question when stated also included information of a similar type from government agencies such as the Centers for Disease Control. PREVENTION, VIOLENCE, SEXUAL ASSAULT, AND STUDENT are clustering together.

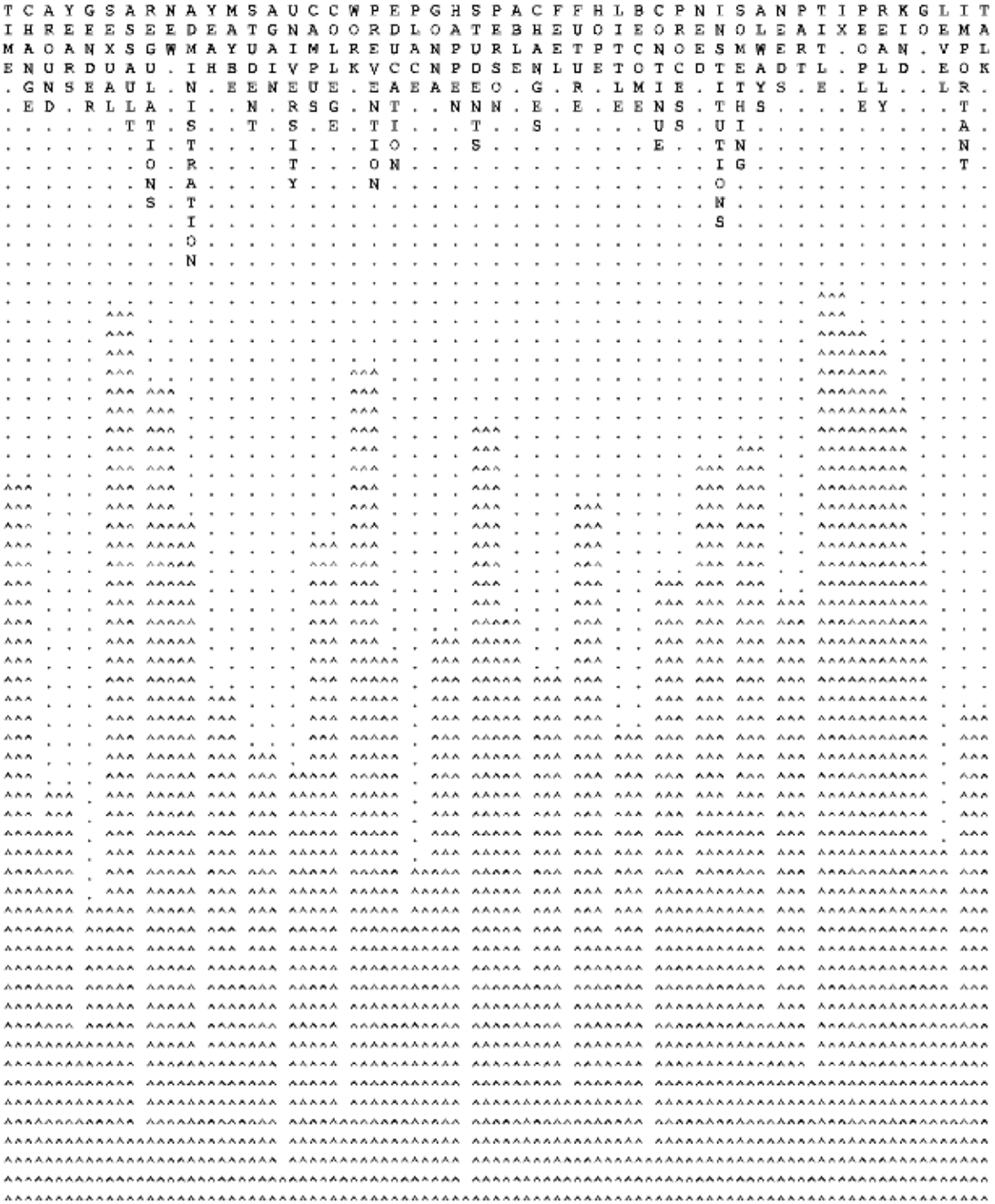
Figure 5 Q4



Question 4 was posed to key informants as a question of the skills, knowledge, and expertise needed to create effective and efficacious training. The question was unguided as usual with a limited prompt of "tell me more". Question 4 appears in dendrogram form in Figure 5. The most salient of clusters is the one composed of SEXUAL, VIOLENCE, and PREVENTION. UNDERSTAND and PEOPLE are found together also. However, it must be clear that the clustering is not to read a sentence; only a neurons firing together.

Question 5 was the broadest of all the questions posed to the Title IX coordinators. The question was about seeing what the circumstances of Title IX are in the near term and beyond. SEXUAL, ASSAULT, and REGULATIONS "fire" together. COLLEGES, WORK, and PREVENTION cluster together.

Figure 6 Q5



6. Discussion

6.1. Title IX coordinator literature, though limited, reports "unease" among Title IX coordinators about the work they do. Some of the findings here would be representative of their unease. The reports shown in dendrograms for the Title IX neural network nodes among 103 key informants shows limited patterns of concepts revolving around the "unrealized potential of Title IX". What the dendrograms represent are the Title IX community's conceptual nodes or constellations. No sentences can be made from the words that appear in the dendrogram. The dendrogram results with words displayed cannot be characterized as a content analysis either. There are patterns of words as neurons firing together in the dendrograms though. Nonetheless, the neuron or word patterns show a lack of consensus about the Title IX work coordinators do. The open-ended questions were intended to allow a consensus to develop in a non-directed way.

What can be said is that COMMUNITY found in Question 2's node is strongly linked with the other neurons in that dendrogram node. This finding is suggestive of a clustering around some form of group effort in the work of Title IX. One can see clusters of concepts in and among the other dendrograms of grouping such as PEOPLE, UNDERSTANDING, HELP, TRYING, AND SUPPORT leading to the view that these concepts underscore the notion of a community working together as a desired set of conditions under which Title IX can better be accomplished. SEXUAL ASSAULT and SEX EDUCATION found in nodes displayed here.

6.2. What must happen next is to use the dendrograms to add to the 8 illustrated above with a maximum of 4 more from the clustering together of words or neurons. The 12 terms will be used to form a Distance Magnitude Estimation (DME) questionnaire. The DME questionnaire will yield spatial coordinates displayed in a multidimensional space showing the position in that space occupied by the words/concepts/neurons. The positions reveal whether the concept needs to be moved closer to the self-position which is in every Galileo concept map. The self is present in the human mind at all times; thus, knowing how close or how far away a concept is from the self becomes the first step in moving the concept.

6.3. Title IX thinking space has been surveyed in this research. Surveys precede maps of physical space to lay out housing tracts, bridge locations, highways, water lines, and other such elements of community work and life. The concept map of Title IX conceptual space is preceded by a survey of the neurons firing together. The survey producing the 5 neuron nodes leads directly to the map of conceptual space.

ACKNOWLEDGEMENTS: The author wishes to acknowledge the welcomed support of the Rhode Island American Society for Public Administration chapter in funding the specialized software analysis of the data. The author also wants to thank Scott Danielsen who has shown long term commitment to this and previous Galileo research with expertise and software operations. An additional acknowledgement goes to the Provost Research Fund of Roger Williams University. All 103 Title IX Coordinators who contributed their thinking to this Galileo Project also deserve a well-deserved "Thank You".

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