**Chapter Four – Examples of Conceptual Structures**

**Abstract**

**Concepts (i.e., swarms of ideas) can consist of ideas organized by dimension, frequency, grammatical class, or combinations of those defining structures. Examples of concepts illustrate structures based on simple ideas (pairs of terms) to complex ideas (triadic or quadratic combinations). Simple pairs involve ideas with single primary terms (i.e., disaster, health or cancer) and single related terms. Complex pairs involve ideas with combinations of primary terms (i.e., health disparities, health literacy, or health literacy knowledge) and single or complex related terms.**

**Introduction**

**Simple Paired Ideas**

**Table 1. Disaster Related Ideas Representing High Frequency of Use, Dimensional Membership, Noun Classification, and Specific in Meaning.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Disaster** | **Freq** | **Dimension** |  | **Disaster** | **Freq** | **Dimension** |
| **children** | **326** | **Personal** |  | **emergency** | **817** | **Outcome** |
| **worker** | **270** | **Personal** |  | **victim** | **321** | **Outcome** |
| **community** | **507** | **Environmental** |  | **recovery** | **282** | **Outcome** |
| **nation** | **406** | **Environmental** |  | **survivor** | **228** | **Outcome** |
| **exposure** | **397** | **Environmental** |  | **hazard** | **192** | **Outcome** |
| **public** | **390** | **Environmental** |  | **resilience** | **185** | **Outcome** |
| **stress** | **507** | **Subject** |  | **damage** | **174** | **Outcome** |
| **earthquake** | **347** | **Subject** |  | **risk** | **172** | **Outcome** |
| **flood** | **179** | **Subject** |  | **management** | **788** | **Method** |
| **hurricane** | **177** | **Subject** |  | **research** | **539** | **Method** |
| **hospital** | **535** | **Treatment** |  | **experience** | **420** | **Method** |
| **education** | **326** | **Treatment** |  | **planning** | **415** | **Method** |
| **nursing** | **311** | **Treatment** |  | **support** | **372** | **Method** |
| **medicine** | **302** | **Treatment** |  | **model** | **276** | **Method** |
| **clinic** | **237** | **Treatment** |  | **service** | **229** | **Method** |
| **health** | **1735** | **Outcome** |  | **survey** | **198** | **Method** |
| **response** | **1213** | **Outcome** |  | **government** | **181** | **Method** |

**An example of a simple pair idea can be found in ideas describing disasters. The related terms are shown in Table 1. The terms are linked by numerous authors to the primary term – disaster – and enable interpretation of the word. The related terms shown are among the highest frequency ideas and all are nouns. The ideas are members of the dimensions shown and all were classified as specific in describing some attribute of the primary term.**

**The dimensions can be rearranged to develop hypotheses describing the study subjects (Personal, Environmental, and Subject Factors) and the effects of treatments and the changes in the study group definitions (Outcome Factors). This arrangement involves Outcome Factors 🡪 Personal Factors. Examples would be:**

1. **Disaster may be mitigated by focusing on Health (Outcome Factor) and Medicine (Treatment Factor) and the related changes in Children (Personal Factor), Community (Environmental Factor), and Stress (Subject Factor). While these related terms formed the highest frequency ideas with – disaster --, formal studies to determine the appropriate definition of health status, the best treatment approaches, the duration of treatment and the recovery of children to stress related conditions have not been published. Studies dealing with this combination of related terms could lead to effective treatments and important preventive approaches to minimize or eliminate stress.**
2. **Disaster may be mitigated by accelerating Response (Outcome Factor) to Clinic (Treatment Factor) and the related changes in Workers (Personal Factor), the Nation (Environmental Factor), and Earthquakes (Subject Factor). There have been surveys to determine disaster-related effects on workers. However, interventional studies, to determine the appropriate definition of health status, the best treatment approaches, the duration of treatment and the recovery disease-related conditions, have not been published. Studies dealing with this combination of related terms could lead to effective treatments and important preventive approaches to minimize or eliminate disaster-related diseases.**

**Table 2. Disaster Ideas Arranged to Yield Dimension-Related Hypotheses.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Disaster** | **Freq** | **Dimension** |  | **Disaster** | **Freq** | **Dimension** |
| **health** | **1735** | **Outcome** |  | **hospital** | **535** | **Treatment** |
| **response** | **1213** | **Outcome** |  | **education** | **326** | **Treatment** |
| **emergency** | **817** | **Outcome** |  | **nursing** | **311** | **Treatment** |
| **victim** | **321** | **Outcome** |  | **children** | **326** | **Personal** |
| **recovery** | **282** | **Outcome** |  | **worker** | **270** | **Personal** |
| **survivor** | **228** | **Outcome** |  | **community** | **507** | **Environmental** |
| **hazard** | **192** | **Outcome** |  | **nation** | **406** | **Environmental** |
| **resilience** | **185** | **Outcome** |  | **exposure** | **397** | **Environmental** |
| **damage** | **174** | **Outcome** |  | **public** | **390** | **Environmental** |
| **risk** | **172** | **Outcome** |  | **stress** | **507** | **Subject** |
| **medicine** | **302** | **Treatment** |  | **earthquake** | **347** | **Subject** |
| **clinic** | **237** | **Treatment** |  | **flood** | **179** | **Subject** |
|  |  |  |  | **hurricane** | **177** | **Subject** |

**Table 2 shows the related terms in the Disaster Ideas arranged to generate hypotheses. There are 10 x 5 x 2 x 4 x 4 possibilities yielding a total of 1600 statements. In such a list, there would be some of interest to a given investigator. If confidence is assigned to the existing literature, the opportunities to develop interventional studies are enhanced.**

**From the Hypothesis Forward**

**The development of a hypothesis is an essential first step and has been assumed to require months to years of individual study. With an idea database such as the disaster one, the time to generate a viable and interesting hypothesis can be significantly reduced. With the hypothesis available, the typical description of research methodology can be addressed. Description of the individuals (or objects) to be studied can be constructed. Environmental influences can be addressed. The critical elements in describing the clinical, laboratory, psychological, or educational problem can be arrayed. The treatment (interventions) of interest can be defined as well as the effects (outcome factors) reflecting change. The methods to be employed can be enunciated and defended.**

**In contrast to some expectations, the actual conduct of the study may be the easiest and most enjoyable part. If the preparations were careful and complete, the organization and interpretation of the findings may be straightforward. This version of the research study is shorter to accomplish, more transparent, and directed toward changing the conditions associated with the disaster.**

**Table 3. Related Terms Linked with the Idea – Disaster & Health.**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Terms** | **Freq** | **Dimension** |  | **Terms** | **Freq** | **Dimension** |
| response | 692 | Outcome |  | symptom | 169 | Subject |
| emergency | 461 | Outcome |  | disorder | 146 | Subject |
| exposure | 177 | Outcome |  | knowledge | 129 | Subject |
| survivor | 159 | Outcome |  | hurricane | 103 | Subject |
| recovery | 134 | Outcome |  | flood | 102 | Subject |
| important | 120 | Outcome |  | force | 98 | Subject |
| error | 99 | Outcome |  | literature | 98 | Subject |
| death | 82 | Outcome |  | hazard | 97 | Subject |
| responder | 81 | Outcome |  | casualty | 80 | Subject |
| loss | 80 | Outcome |  | nuclear | 79 | Subject |
| risk | 80 | Outcome |  | nation | 338 | Environmental |
| hospital | 297 | Treatment |  | community | 248 | Environmental |
| education | 203 | Treatment |  | people | 168 | Environmental |
| medicine | 195 | Treatment |  | population | 139 | Environmental |
| nursing | 194 | Treatment |  | worker | 213 | Personal |
| clinic | 157 | Treatment |  | children | 160 | Personal |
| control | 146 | Treatment |  | victim | 126 | Personal |
| mental | 566 | Subject |  | resident | 100 | Personal |
| stress | 221 | Subject |  | adult | 90 | Personal |
| earthquake | 172 | Subject |  | women | 78 | Personal |

**Table 3 shows the related terms linked with the idea – disaster & health. The arrangement shows the ideas from Output Factors 🡪 Personal Factors.**

**What are the consequences of selecting the lowest frequency idea from each dimension? Table 4 shows the selected terms.**

**Table 4. Lower Frequency Terms From Each Dimension in Table 3.**

|  |  |  |
| --- | --- | --- |
| **Terms** | **Freq** | **Dimension** |
| risk | 80 | Outcome |
| control | 146 | Treatment |
| nuclear | 79 | Subject |
| population | 139 | Environmental |
| women | 78 | Personal |

**As seen, the concept representing the idea swarm (Table 4) would deal with nuclear control in a population and the risk to women. As with the hypothesis built using simple paired term ideas, once the study statement is constructed, the effort involves translating terms and adding measures to determine the changes associated with effective control. To the appropriate investigator, that hypothesis and related study could be as interesting as the one considering disaster and its high frequency links.**

**Complex Ideas and Low Frequency Ideas**

**A complex idea involves two or more informative terms making up the primary idea plus additional terms making up the related portion. The result is multiple term idea presented by the author-specialists within the domain of a sentence.**

**Health Literacy as the Primary Idea**

**Health Literacy is a more complex subject. The primary idea consists of two informative terms – health & literacy. More detailed study structures are the rule. Table 5 shows an array of terms, classified within the dimensional format. These terms combined with the primary idea – health & literacy – also have the distinction of being used infrequently by authors. These ideas may be fading from use or recently introduced and growing in popularity. Temporal analysis would be required to determine the present status of these. Given the existing data, and the time period, it is possible to assume that the ideas may be recently introduced.**

**Table 5. Health Literacy Related Terms Occurring with Lowest Frequency in the Period – 2000 to 2016.**

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Personal** |  |  | **Environmental** |  |  | **Subject** |  |  | **Treatment** |  |  | **Outcome** |  |
| **infant** | **8** |  | **indigenous** | **8** |  | **cardiovascular** | **2** |  | **nursing** | **4** |  | **morbidity** | **3** |
| **weight** | **7** |  | **alcohol** | **5** |  | **pregnancy** | **2** |  | **therapy** | **3** |  | **consumption** | **3** |
| **women** | **6** |  | **university** | **4** |  | **incidence** | **2** |  | **surgical** | **3** |  | **reduction** | **2** |
| **african** | **6** |  | **government** | **4** |  | **stroke** | **1** |  | **vaccination** | **1** |  | **consensus** | **2** |
| **mother** | **4** |  | **global** | **3** |  | **impairment** | **1** |  | **vaccine** | **1** |  | **complication** | **2** |
| **childhood** | **4** |  | **housing** | **3** |  | **colorectal** | **1** |  | **hygiene** | **1** |  | **adoption** | **1** |
| **sexual** | **3** |  |  |  |  | **medicaid** | **1** |  | **prescription** | **0** |  | **poverty** | **1** |
|  |  |  |  |  |  | **diabetic** | **1** |  | **immunization** | **0** |  | **achievement** | **1** |
|  |  |  |  |  |  | **malnutrition** | **1** |  | **dialysis** | **0** |  | **decision** | **0** |
|  |  |  |  |  |  |  |  |  |  |  |  | **violence** | **0** |

**The arrangement shown in Table 5 is consistent with the study structure format yielding Personal 🡪 Outcome Factors. Given this array of ideas, can study structures be formulated?**

**Examples are:**

***Infant 🡪 Global 🡪 Impairment 🡪 Immunization 🡪 Complication***

***Infant 🡪 Global 🡪 Impairment 🡪 Immunization 🡪 Achievement***

***Infant 🡪 Global 🡪 Impairment 🡪 Immunization 🡪 Morbidity***

***Weight 🡪 Indigenous 🡪 Diabetic 🡪 Prescription 🡪 Reduction***

**These structures and others can be constructed rapidly by combining the health literacy related ideas. Selection of a particular structure would depend on the interests of the analyst. The fact that the terms shown were infrequently linked with health literacy supports the notion that the studies would provide new knowledge.**

**Hypotheses describing these possible studies could be formed by reversing the terms from Outcome 🡪 Personal Factors. Examples using the first study structure might be:**

***Complication 🡪 Immunization 🡪 Infant 🡪 Global 🡪 Impairment***

Or

***Complications associated with attempting to immunize infants, depends on the global location and the extent of existing impairments.***

Or

***Immunization of infants could result in complications depending on the global location and the extent of existing impairments.***

**Translating this study structure to the specifics of knowledge generation would involve expanding the meaning of key words to specific measures and actions:**

***Personal Factor 🡪 Infant 🡪 Age, sex, race of infants.***

***Environmental Factor 🡪 Geographic locations.***

***Subject Factor 🡪 Existing impairments***

***Treatment Factor 🡪 Immunizations used.***

***Outcome Factor 🡪 Complications observed.***

**Summary**

**These examples illustrate the application of higher cognitive functions beginning with synthesis and ending with application. The generation of study structures and statements that could serve as interesting studies is made feasible using ideas. The actual selection of a particular study structure and hypothesis employs the cognitive effort of the analyst. However, this personal and private operation can be made more transparent by translating the keywords in the selected ideas to measures, criteria, and decision rules. With those enunciated, as with proving of theorems, the creative path can be duplicated by students once made apparent by the original analyst. Transparent cognitive functions also enable third-parties to evaluate and understand the creative actions involved.**