The Functional Lexico-Grammar of Semantic Prosody in the Quran
“And the sun moves[along its course] to its resting place that is the measuring [or determination] of the All-Mighty, the All-Knowing, and for the moon We have appointed certain stations, until it returns like an old curved stick. It is not for the sun to overtake the moon, nor for the night to overstrip the day, each coursing in its own orbit”.


“WHEN THE SUN is folded up, the stars turn dim and scatter, the mountains made to move, …,etc.”

Outline

Semantic Prosody (SP)

Nature in the Quran

Methodology

Results & Discussion
Semantic Prosody

- **Semantic prosody**, also discourse prosody, describes the way in which certain seemingly neutral words can be perceived with positive or negative associations through frequent occurrences with particular collocations.

- **Louw (1993)** borrowed the term ‘semantic prosody’ from Firth (1975), who used it to refer to “phonological colouring which spreads beyond semantic boundaries”. (e.g. the word *animal*).

- The adverb *utterly*, the phrase *bent on* and the expression *symptomatic of* = negative SP. They are followed by expressions which refer to undesirable things such as *destroying, ruining, clinical depression, multitude of sins*, etc.

- The verb *build up*: as a transitive verb = positive SP (e.g. build up confidence), and as an intransitive verb = negative SP (e.g. resistance builds up).
Semantic Prosody

- Semantic prosody is “the spreading of connotational colouring beyond single word boundaries” (Partington 1998).

- “When the usage of a word gives an impression of an attitudinal or pragmatic meaning, this is called semantic prosody” (Sinclair 1999).

- “A word may be said to have a particular semantic prosody if it can be shown to co-occur typically with other words that belong to a particular semantic set” (Hunston & Francis 2000).
Figure 1: The Extended Lexical Unit (Sinclair 2004)
Nature in the Quran

- **The Holy Quran** (114 surrahs, i.e. chapters, each divided into ayas, i.e. verses) is a rich source for linguistic and stylistic research.
- **Previous literature**: (Bell 1978; Robinson 1996; Yahya 2003 Rahman 2009; and Muhamed 2012).

**Figure 2: An Overview of Nature in the Quran**

- glorifying God's might
- suspending its efficacy in punishment & Day of Judgement
- miracle stories
Natural Phenomena in the Quran

1. Man  
2. Woman  
3. Brain  
4. Soul  
5. Body  
6. Mankind  
7. Meat  
8. Heart  
9. Blood  
10. Hand  
11. Neck  
12. Face  
13. Skin  
14. Eye  
15. Foot  
16. Head  
17. Leg  
18. Jinn  
19. Cow  
20. Sheep  
21. Monkey  
22. Horse  
23. Bird  
24. Dog  
25. Fruit  
26. Plant  
27. Tree  
28. Whale  
29. Seed  
30. Garden  
31. Fish  
32. Earth  
33. sky  
34. Heaven  
35. Moon  
36. Sun  
37. Wind  
38. Mud  
39. Sand  
40. Rain  
41. Sea  
42. Water  
43. Mountain  
44. Star  
45. Fire  
46. Light  
47. Darkness  
48. Day  
49. Night  
50. Dawn  
51. Forenoon  
52. Paradise  
53. Hell  
54. Stone  
55. Rock  
56. Stick  
57. Land  
58. River  
59. Colour  
60. Cloud  
61. Cold  
62. Hot  
63. Shade  
64. Flood  
65. Thunder  
66. Stream  
67. Hour  
68. Ground  
69. Animal  
70. Morning  
71. Evening  
72. Grain  
73. Sign  
74. Life  
75. Death  
76. Creature  
77. Creation  
78. Being  
79. Vegetation  
80. Breast  
81. Men  
82. Women  
83. Tilth  
84. Cattle  
85. Crop  
86. Food  
87. Goat  
88. Camel  
89. Ox  
90. Oxen  
91. Clay  
92. Nature  
93. Frog  
94. Lice  
95. Locust  
96. date-palm  
97. Harvest  
98. Calf  
99. Mount  
100. Fountain  
101. Waves  
102. Date-palms  
103. Storm  
104. Lightning  
105. Shower  
106. Dust  
107. Jinns  
108. Brains  
109. Hearts  
110. Eyes  
111. Hands  
112. Skins  
113. Cows  
114. Monkeys  
115. Apes  
116. Dogs  
117. Birds  
118. Plants  
119. Trees  
120. Seeds  
121. Gardens  
122. Skies  
123. Heavens  
124. Winds  
125. Horses  
126. Seas  
127. Mountains  
128. Stars  
129. Days  
130. Nights  
131. Stones  
132. Rocks  
133. Rivers  
134. Springs  
135. Clouds  
136. Fountains  
137. Shadow  
138. Hours  
139. Animals  
140. Signs  
141. Breasts  
142. Goats  
143. Camels  
144. Crops  
145. earthquake
Nature in the Quran

Figure 3: An Ontology of Nature Terms
### Nature in the Quran

#### An Example of a Nature Semantic Category

<table>
<thead>
<tr>
<th>Semantic Category</th>
<th>Subcategory (s)</th>
<th>English Quranic Concept</th>
<th>English Terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astronomical Bodies</td>
<td>Astronomical objects</td>
<td>moon</td>
<td>moon</td>
</tr>
<tr>
<td></td>
<td></td>
<td>star</td>
<td>star, Sirius</td>
</tr>
<tr>
<td></td>
<td></td>
<td>earth</td>
<td>earth</td>
</tr>
<tr>
<td></td>
<td></td>
<td>planet</td>
<td>planet</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sky(s)</td>
<td>sky(s), constellation, pieces of the sky</td>
</tr>
<tr>
<td></td>
<td></td>
<td>the universe</td>
<td>worlds, universe</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sun</td>
<td>sun</td>
</tr>
</tbody>
</table>
Methodology

• In the process of exploring the semantic prosody of natural phenomena in the Quran, the functional **lexico-grammatical patterns** were utilized in finding out the different pragmatic functions of nature in the Quran.

• These patterns are the significant collocations, namely **bigrams**, which are found via a list of tasks adopted from Manning and Schütze (1999) using the Python-based Natural Language Toolkit (Bird et al 2009) on Yusuf Ali’s acclaimed translation of the Quran.

• The role of bigrams is to convey the pragmatic discourse functions and the connotational colouring of nature in different contextual environments.
Methodology

Text Preprocessing

• Text Preprocessing is the transformations applied to the data before feeding it to the algorithm. It is one of the 5 steps of textual data science framework (Mayo 2018, [www.kdnuggets.com]):

1. Data collection and accessibility
2. **Data preprocessing**
3. Data evaluation & visualization
4. Model building
5. Model evaluation

**Figure 4:** The text data preprocessing framework
Methodology

Text Preprocessing

```python
# python code

text = open("C:\Python27\Yusif Ali\Corpus\makkah yusif.txt", 'r').read()
raw = text
raw = raw[1:]
```

From NLTK: Tokenization; string; stopwords

- Remove punctuation
- Tokenize words and make all lowercase
- Remove stopwords

```python
###2.2. Tokenization and lower case only
tokens = nltk.word_tokenize(raw1)
print tokens

raw2 = [w.lower() for w in tokens]  ### lower case only
print raw2
```
Methodology

- Raw Frequency & Collocation Extraction
- Contextual Meanings
- Connotational Colouring
- Semantic Prosody

Figure 5: Finding Semantic Prosody of Nature in the Quran
(Based on Sinclair 2003)
Methodology

Frequency Distribution

- This function in Python was run against the set of individual tokens of the text to calculate the counts of terms of the list natural phenomena

```python
from nltk.probability import FreqDist
fdist = FreqDist(word for word in dataset2)
inspect = fdist

for f in dataset2:
    print(f
    print(fdist[f])
```
Methodology

Collocation Extraction

- After having found the raw frequencies of terms, we ran the collocation *Log Likelihood* measure, which evaluated whether the co-occurrence is purely by chance or statistically significant. Based on the scores of this test, the low frequency candidates were removed.
<table>
<thead>
<tr>
<th>All’s Translation</th>
<th>B2</th>
<th>B3</th>
<th>B4</th>
<th>B5</th>
<th>B12</th>
<th>Contextual Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>6(99)It is He Who sendeth down rain from the skies: with it We produce vegetation</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>rain skies</td>
</tr>
<tr>
<td>of all kinds: from some We produce green (crops), out of which We produce grain,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>rain produce</td>
</tr>
<tr>
<td>heaped up (at harvest); out of the date-palm and its sheaths (or spathes) (come)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>rain vegetation</td>
</tr>
<tr>
<td>clusters of dates hanging low and near: and (then there are) gardens of grapes,</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>sign of God</td>
</tr>
<tr>
<td>and olives, and pomegranates, each similar (in kind) yet different (in variety):</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>when they begin to bear fruit, feast your eyes with the fruit and the ripeness</td>
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<tr>
<td>thereof. Behold! in these things there are signs for people who believe.</td>
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<tr>
<td>7(57)It is He Who sendeth the winds like heralds of glad tidings, going before</td>
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<tr>
<td>His mercy; when they have carried the heavy-laden clouds, We drive them to a</td>
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<tr>
<td>land that is dead, make rain to descend thereon, and produce every kind of</td>
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<tr>
<td>harvest therewith: thus shall We raise up the dead: perchance ye may remember.</td>
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<tr>
<td>8(32)Remember how they said: “O Allah if this is indeed the Truth from Thee,</td>
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<tr>
<td>rain down on us a shower of stones form the sky, or send us a grievous penalty.”</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>punishment of</td>
</tr>
<tr>
<td>10(24)The likeness of the life of the present is as the rain which We send down</td>
<td></td>
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<tr>
<td>from the skies: by its mingling arises the produce of the earth- which provides</td>
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<td></td>
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</tr>
<tr>
<td>food for men and animals: (it grows) till the earth is clad with its golden</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>sign of God</td>
</tr>
<tr>
<td>ornaments and is decked out (in beauty): the people to whom it belongs think</td>
<td></td>
<td></td>
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<tr>
<td>they have all powers of disposal over it. There reaches it Our command by night</td>
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</tr>
<tr>
<td>or by day, and We make it like a harvest clean-mown, as if it had not flourished</td>
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<td></td>
</tr>
<tr>
<td>only the day before! thus do We explain the Signs in detail for those who reflect.</td>
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</tr>
<tr>
<td>11(44)Then the word went forth: “O earth! swallow up thy water, and O sky!</td>
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</tr>
<tr>
<td>Withhold (thy rain)!” and the water abated, and the matter was ended. The Ark</td>
<td></td>
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</tr>
<tr>
<td>rested on Mount Judi, and the word went forth: “Away with those who do wrong!”</td>
<td></td>
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</tr>
<tr>
<td>15(22)And We send the fecundating winds, then cause the rain to descend from the</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sky, therewith providing you with water (in abundance), though ye are not the</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>guardians of its stores.</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>16(10)It is He who sends down rain from the sky: from it ye drink, and out of</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>it (grows) the vegetation on which ye feed your cattle.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Methodology

- **Connotational colouring (CC)** refers to the connotation the bigrams and verse acquire in accordance with their contexts as a whole, not as individual words.
Methodology

- To obtain a **SP**, we calculated the percentage (CC pos/neg/neu counts) out of the number of raw frequencies of the term in the Quran. The highest percentage of positive or negative connotational colouring for each was allocated as the SP of the term (as in Sinclair 2003).

<table>
<thead>
<tr>
<th>Term</th>
<th>Freq</th>
<th>Pos CC</th>
<th>Neg CC</th>
<th>Neu CC</th>
<th>Pos%</th>
<th>Neg%</th>
<th>Neu %</th>
<th>SP</th>
</tr>
</thead>
<tbody>
<tr>
<td>earth</td>
<td>418</td>
<td>217</td>
<td>29</td>
<td>172</td>
<td>51.9%</td>
<td>6.9%</td>
<td>41.0%</td>
<td>pos</td>
</tr>
</tbody>
</table>
Results

Frequencies of Nature Semantic Categories

Astronomical Bodies, Articraft, Event, Physical Attributes, Physical Substances, Weather Phenomena, Living Creations, Location, [Others]
## 10-Best Bigrams of the Term *mountain*

<table>
<thead>
<tr>
<th>Bigram</th>
<th>Co-occurrence Count</th>
<th>Frequency of Collocate</th>
<th>Log Likelihood</th>
</tr>
</thead>
<tbody>
<tr>
<td>earth mountain</td>
<td>19</td>
<td>419</td>
<td>128.4767</td>
</tr>
<tr>
<td>mountain firm</td>
<td>11</td>
<td>39</td>
<td>114.95219</td>
</tr>
<tr>
<td>set mountain</td>
<td>8</td>
<td>93</td>
<td>62.2958</td>
</tr>
<tr>
<td>scatter mountain</td>
<td>6</td>
<td>24</td>
<td>60.29702</td>
</tr>
<tr>
<td>mountain stand</td>
<td>7</td>
<td>76</td>
<td>55.3395</td>
</tr>
<tr>
<td>mountain asunder</td>
<td>5</td>
<td>17</td>
<td>52.02489</td>
</tr>
<tr>
<td>mountain shake</td>
<td>4</td>
<td>8</td>
<td>46.90904</td>
</tr>
<tr>
<td>made mountain</td>
<td>8</td>
<td>287</td>
<td>44.02183</td>
</tr>
<tr>
<td>day mountain</td>
<td>9</td>
<td>560</td>
<td>39.99972</td>
</tr>
<tr>
<td>commotion mountain</td>
<td>3</td>
<td>5</td>
<td>36.70099</td>
</tr>
</tbody>
</table>
Results

The Annotated SP of Nature

15|19|And the earth We have spread out (like a carpet); set thereon mountains firm and immovable; and produced therein all kinds of things in due balance.

69|14|And the earth is moved, and its mountains, and they are crushed to powder at one stroke,-

Earth mountains

God's creation [pos]

Mountains firm

Mountains set

Mountains spread

Calamities of day of judgment [neg]
### Examples of SP of Nature in the Quran

<table>
<thead>
<tr>
<th>Term</th>
<th>Freq</th>
<th>Pos CC</th>
<th>Neg CC</th>
<th>Neu CC</th>
<th>Pos%</th>
<th>Neg%</th>
<th>Neu %</th>
<th>SP</th>
</tr>
</thead>
<tbody>
<tr>
<td>earth</td>
<td>418</td>
<td>217</td>
<td>29</td>
<td>172</td>
<td>51.9%</td>
<td>6.9%</td>
<td>41.0%</td>
<td>pos</td>
</tr>
<tr>
<td>heavens</td>
<td>200</td>
<td>146</td>
<td>15</td>
<td>39</td>
<td>73.0%</td>
<td>7.5%</td>
<td>19.5%</td>
<td>pos</td>
</tr>
<tr>
<td>day</td>
<td>520</td>
<td>58</td>
<td>83</td>
<td>379</td>
<td>11.0%</td>
<td>15.9%</td>
<td>72.9%</td>
<td>neu</td>
</tr>
<tr>
<td>fire</td>
<td>200</td>
<td>5</td>
<td>87</td>
<td>108</td>
<td>2.5%</td>
<td>43.5%</td>
<td>54.0%</td>
<td>neu</td>
</tr>
<tr>
<td>stones</td>
<td>12</td>
<td>0</td>
<td>6</td>
<td>6</td>
<td>0.0%</td>
<td>50.0%</td>
<td>33.3%</td>
<td>neg</td>
</tr>
</tbody>
</table>
Results

Recurring syntactic patterns of nature in the Quran

verbs: sends; asunder; rent; send; produce; seest; cause; comes; fall; see

sky

adjectives: six, spacious

nouns: rain; earth; piece; water; sustenance; life; Allah
## Results

### Nature Pragmatic Categories Based on Collocation

<table>
<thead>
<tr>
<th>Pragmatic Category</th>
<th>Collocates in Context</th>
<th>CC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Glorifying God</td>
<td>Words such as <em>belong, dominion, To Him, knowledge, sustenance.</em></td>
<td>pos</td>
</tr>
<tr>
<td>God's creation</td>
<td>Words such as <em>create, creation, sign, signs, make, sent, send.</em></td>
<td>pos</td>
</tr>
<tr>
<td>Description of believers</td>
<td>Words such as <em>believers, righteous, righteousness.</em></td>
<td>pos</td>
</tr>
<tr>
<td>Calamities or horrors of the Day of Judgment</td>
<td>Words such as <em>blast, fear, bear witness, sky rent cleft asunder, woe</em></td>
<td>neg</td>
</tr>
<tr>
<td>Punishment 2 (punishment in the Hereafter)</td>
<td>Words such as penalty Hereafter, companions of fire, Hell, companions of Hell</td>
<td>neg</td>
</tr>
</tbody>
</table>
Results

Nature Pragmatic Categories Based on Collocation

Pragmatic Functions of Nature as a Sign in the Quran
Discussion

• The majority of positive semantic prosody pertaining to nature terms in the Quran is semantically related to locations and astronomical bodies; the negatives to the semantic field of weather phenomena.

• On the pragmatic level, our findings produced a taxonomy, based on collocation and connotational colouring, for classification of pragmatic functions associated with nature in the Quran. These include: glorifying God [+]; Punishment [-]; Day of Judgment calamities [-]; Islamic teachings [ ], etc.

• Both the semantic and pragmatic meanings of nature in the Quran were elicited by the exploration of semantic prosody via the lexicogrammatical patterns.
• **Lexico-grammatical patterns** were identified in the form of bigrams which portray the different contexts in which lexical items, which are natural phenomena, occur. [term+ verb or verb+ term; term+ adjective or adjective+ term; and term+ noun or noun+ term].

• The connotation of these collocates in the patterns colours the neutral connotation of the term with the changing of contextual environments.

• The connotational colouring of these patterns reflects the **pragmatic** functions of nature in the Quran.
Conclusion

• The exploration of semantic prosody of nature in the Quran conveyed the continuity between grammar and lexis; the vital correlation between words and their contexts and the representation of meaning.

• In future studies, the semantic prosody of nature in the Quran can be further explored in depth to relate it to the elicited pragmatic functions, and the same methodology can be applied to the original Arabic text or other translations of the Quran for comparative studies.


Thank you for Listening