A New Method for Analyzing Emotions in Jewish Texts

There has been surprisingly little research on emotion in Jewish texts, and especially the rabbinic corpus. The most well known analysis of emotion in rabbinic texts is Neusner’s (1987). However, as he admits, he came to the topic “emotion” toward the end of the research process, after being pushed by a student to recognize that there is not an easy divide between reason and emotion (xi). In addition, his is not a systematic treatment of the subject. As if such a thing was possible.

My present task, nevertheless, is to try to develop a systematic way of approaching emotion in late Biblical and rabbinic texts. Despite the fact that such texts are eclectic and probably do not represent a single point of view or worldview, many scholars nevertheless think that we can describe some centers of gravity with regard to emotion for the tradition as a whole. While a treatise on the understanding of emotion for a particular ancient rabbi is certainly worth pursuing, for my purposes in this chapter I am interested in characterizing the nature of the discourse about emotion as it applies to particular texts. In other words, my goal is to understand both the Judaic minds/hearts behind such texts, in addition to how the language within such texts could activate the emotions of readers. Let us think of my methodology as a kind of textual experiment.

I use the model of emotion developed by the Swiss Center for Affective Science, and in particular, Klaus Scherer, as guide throughout. I have used Scherer’s theory to build a data-mining program that can analyze the use of emotions within any text, including descriptions of physiological “symptoms” that are tied directly to emotion through the theory. I then apply this program to a few Judaic texts as a kind of “proof of concept” that can be replicated and expanded by other scholars. The main outcome of the chapter is thus to build a new computer-assisted hermeneutic method that focuses on emotions within texts.

I suggest that such an approach can tell us something new about the role of emotion in ancient Judaism. A key assumption of this approach, needless to
say, is that some basic human emotions are universal. They are not necessarily
innate, meaning inborn, but they are universal in the sense that they develop
over time in every human group due to the nature of human groups. In other
words, they pop up in every human culture throughout the world with the
same basic physiological “symptoms”. Of course, there are always differences,
and these are very important. However, in general, though the causes of what
makes someone angry, content, fearful, or embarrassed may be quite different
across cultures, all humans nevertheless express these emotions, and often in
similar ways (for a good discussion of the debate about the universality of
some facial expressions, see Ekman 1999).

This notion of the “expression” of emotions may lead us in the wrong
direction. Emotions, according to the scientific research that guides my
understanding, are complex phenomena made up of five component parts.
Within this framework, emotion is defined as “an episode of interrelated,
synchronized changes in the states of all or most of the five organismic
subsystems in response to the evaluation of an external or internal stimulus
event as relevant to major concerns of the organism (Scherer, 1987, 2001)”
(Scherer 2005). Each “organismic subsystem” is connected to an emotion
“component.” Specifically, the five component parts are 1) a subjective feeling
component, i.e. a “feeling;” note that though this “feeling” has often been
considered the core of emotion, in Scherer’s model it is only one component;
2) a motor expression component; this can include either vocal or facial
expression; 3) a motivational component; by this Scherer means that emotions
tend to produce behaviors, or action tendencies—for example, fight or flight;
4) a neurophysiological component; this includes bodily and other
neurological symptoms; 5) a cognitive component; Scherer calls this
“appraisal.” Appraisal plays a crucial role in driving the emotional process:
these subsystems function independently most of the time, yet “the special
nature of emotion as a hypothetical construct consists of the coordination and
synchronization of all of these systems during an emotion episode, driven by
appraisal (Scherer, 2004[b])” (Scherer 2005, 698–699). In other words,
appraisal unifies all of these components.

Scherer notes a few of what he calls “design features” of emotions that he
thinks differentiate them from other types of affective processes, such as
preferences or moods, though all of these are related. First, emotions are “event-
focused” in the sense that they are in response to particular “triggers.” These
can be external events, like thunderstorms, or “internal” triggers, either in the
form of memories or images, but also neuroendocrine or other physiological
changes. Emotions are triggered in the sense that we cannot decide to have
particular emotions, and nor do they describe long-term characteristics of a
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person. Second, emotions are "appraisal driven." In this sense, Scherer regards emotions as "relevance detectors." The appraisal component is rather vague in the model, but ranges from automatic and implicit to conscious evaluation with regard to the "concerns of the organism." In other words, emotions focus the body in particular ways that are significant to the wellbeing of the organism, broadly understood (though, of course, emotions can lead an organism astray for a variety of reasons). Third, the next "design feature" is "response synchronization," by which Scherer means that there is coordination among these various components and subsystems to generate a unitary response. Fourth, emotions are rarely "steady states," rather they can change very rapidly depending on the appraisal process. Fifth, emotions have a very strong behavioral impact that, in some cases, may have adaptive benefits. Sixth, emotions can be differentiated from moods based on their intensity (emotions are usually more intense than moods). Seventh, emotions are relatively short lived—again differentiating them from moods (emotions are usually shorter in duration).

The final important theoretical point to make before moving on to Jewish texts is a useful distinction Scherer (and others) make between "utilitarian" and "aesthetic" emotions (2005, 706). The former are "utilitarian in the sense of facilitating our adaptation to events that have important consequences for our wellbeing. Such adaptive functions are the preparation of action tendencies (fight, flight), recovery and reorientation (grief, work), motivational enhancement (joy, pride), or the creation of social obligations (reparation)" (706). Aesthetic emotions are not as easily tied to functional effects. These are the kind of emotions experienced during music or other arts. Some examples of such aesthetic emotions are "being moved or awed, being full of wonder, admiration, bliss, ecstasy, fascination, harmony, rapture, solemnity." There is a distinct bodily component to such emotions, but they are distinguished from utilitarian emotions because they are not "in the service of behavioral readiness" (706).

Based on this understanding of emotion, Scherer has developed a model of the "semantic space" of emotions in Western languages (707–709). For our purposes in the analysis of text, we may think of the semantic space as belonging to the "appraisal" level of emotions. As noted, within a particular emotional process, the component levels are synchronized and coordinated. Appraisal, we saw, was the predominant cognitive component of emotion; we can think of this as the reflective level of emotion that has the effect of unifying the emotion as a singular experience for the organism. Scherer has developed an EXCEL Macro program called GALC that can analyze small
sections of text according to this model to determine the emotion presented
(or a mixed emotion).

The question I pursue is whether it is possible to import some of these
tools from the science of affect into the analysis of Judaic texts. In what follows
I utilize GALS in an analysis of Song of Songs to show that this is indeed
possible. I select Song of Songs because it is probably the most emotionally
resonant text in Judaic and Biblical literature. It also has a long history of
analysis of its emotional and erotically charged elements. GALS is designed to
handle relatively small sections of text, since it is used as a tool to analyze the
emotional character of survey answers; in this way, the small chapter lengths of
Song of Songs makes it ideal. I then go on to build a tool to analyze larger
sections of text using the text data-mining program Automap. I use the tool to
analyze the main rabbinic commentary on Song of Songs, known as Song of
Songs Rabbah.

Since we do not have ancient rabbis around anymore to study, the text is
basically all we have to go on in trying to understand their hearts/minds. But I
think this model—analyzing the semantic space of emotion in texts using the
latest research on emotion—is very promising. In addition, the model does us a
favor in tying the body directly to textual representation, by outlining the
typical “physiological symptoms” associated with emotion. The physiological
symptom, we saw, was one of the five components of emotion. My analysis
below will focus in particular on these bodily “symptoms” within rabbinic
texts, though any of the component parts could serve as a hermeneutic key.

In an attempt to quantify this semantic space, Scherer's model of emotion
has led to the development of what he calls the Geneva Emotion Wheel. This
is an image used to study emotional appraisal in subjects without leading them
to specific outcomes. In general such wheels either have two or three axes (see
Klein's chapter in this volume). Scherer's wheel has three dimensions of
emotion appraisal: 1) positive/negative and 2) high control/low control, in
addition the emotions are evaluated in terms of 3) intensity on a scale of 1–5.
The wheel provides a scientifically tractable way to visualize the semantic space
of emotions in particular contexts.

My plan is to take specific rabbinic texts and sugas and use the
physiological “symptoms” noted before and the semantic space analysis to
parse them and then plot the results on the emotion wheel. This will give us a
picture of the emotional flavor of the text in question. Of course this model
can be exported to texts outside the rabbinic and Jewish corpus. In what
follows, I present a “proof of concept” by analyzing Song of Songs and the
commentary on it.
GALC Analysis of Song of Songs

Song of Songs originates from the love poetry and songs of the ancient near east, and was originally written down in Hebrew. Since the GALC program is not yet available in Hebrew, we must make do with a translation. I have selected the English Standard Version to analyze. GALC takes small pieces of text and analyzes the semantic content to determine the dominant emotion. If there is a mixed emotion, the program will output two emotion concepts. I input each of the short eight chapters of the Song. Here was the output:

Chapter 1: Anger
Chapter 2: Anger
Chapter 3: Anger
Chapter 4: Amusement
Chapter 5: Anger
Chapter 6: Admiration/Awe
Chapter 7: Anger
Chapter 8: Anger

So we see something truly fascinating, and perhaps informative, emerges out of this analysis. Six of the eight chapters register a dominant emotion of anger. All of the emotion outputs register only one emotion (Admiration/Awe counts as one). This finding is perhaps counter-intuitive to our expectations about a love poem, but perhaps we can make sense of it. Part of the problem is that the text as it stands now is a composite of a number of smaller poems. Roland E. Murphy, in his entry on the Song for the Anchor Bible Dictionary, notes that scholars have suggested there are anywhere from 6 to 25 distinct poems within the text. He suggests a compromise of ten units to the Song (Murphy 1996). When we use his structure a remarkably different emotional pattern emerges:

1:2-6 Anger//Feeling Love  
1:7-2:7 Anger//Feeling Love  
2:8-17 Anger//Feeling Love  
3:1-5 Feeling Love//Hatred  
3:6-11 Anger//Boredom  
4:1-5:1 Amusement//Anger  
5:2-6:4 Admiration and Awe//Anger  
6:5-12 Admiration and Awe//Anger  
7:1-8:4 Anger//Contempt  
8:5-14 Anger//Boredom
In this case we have mixed emotions for all of the units. Anger is once again the dominant emotion, but it is mixed with others, suggesting a much more complex picture. The fact that “anger” is an underlying emotion of such a classic love poem is surprising, but perhaps is to be explained by the fact that aggression (and anger) is the negative emotion that always comes along with any form of attachment, and love in particular. In other words, part of loving something is the thought that it could be taken away (or is in fact already absent, such as a distant lover; see Kernberg 1991 for a classic description in psychoanalysis). This association perhaps helps us make more sense of the famous climax of the song in Chapter 8, Verse 6:

[Set me like a seal on your heart, a seal on your arm, for love is fierce as death, jealousy hard as Sheol; its flames are flames of fire, a divine flame.]

More recent study of moral and emotional psychology echoes the intuition developed in psychoanalysis about the relation between anger (or aggression) and love. For example—in Scherer’s three dimensional model of emotion with the categories of positive/negative, high arousal/low arousal, and high control/low control—anger and love are both high arousal and high control, though of course they differ on the positive or negative axis. This close relation between the flames of love and anger is also expressed in the classic characterization of God in the Judaic tradition as a jealous god who manifests himself in the form of fire (see Geller 1994).

Automap Analysis of Song of Songs

Automap is a data-mining program that can handle extremely long sections of text, such as the whole of Talmudic literature. Using the GALC methodology above and Automap together we can characterize the emotional flavor of individual sugas, sections, or the text as a whole. Automap and data-mining programs like it thus have the potential to revolutionize the study of texts. For now, I simply ran a word-frequency analysis. When analyzed by word frequency, the 40 most used words in the text are as follows: beloved, love, Jerusalem, beautiful, young, breasts, daughters, myrrh, Lebanon, eyes, found, sister, wine, Behold, Solomon, bride, flock, fragrance, garden, heart, lilies, soul, adjure, gazelle, gold, head, house, lovely, loves, spices, tree, vineyards, voice, women, cheeks, fruit, give, gone, hand, lips.

Though these words are remarkable in their mundanity, or presence, and thus ground the poem in a distinctive way, it is perhaps surprising that so little
of the language in the poem is specifically about emotions. As we saw above, two component parts or levels to emotion are its physiological symptom and motor expression. For the former, for example, we have feeling cold shivers or hot flashes on the neck or chest, sweating, weak limbs, growing pale, stomach pain, and heart-rate changes, among others (see Scherer 2005, 710). For the latter, we have smiling, mouth tensing, frowning, tears, volume changes of voice, speech disturbances, and moving forward or backward, among others. Using this type of language in literature and narrative is both expressive and evocative of emotion. Though the Song of Songs is deeply descriptive when it comes to showing how wonderful the lovers are in the five basic senses, it is not descriptive in an experiential sense concerning emotion.

**Song of Songs Rabbah**

I have selected Song of Songs Rabbah to analyze as final illustration because it is the canonical commentary on Song of Songs in the rabbinic tradition. The text is very much longer than Song of Songs, and thus gives us the opportunity to put a program like Automap to work. I am particularly interested in analyzing in terms of the physiological and motor symptoms noted above. When these are analyzed in terms of frequency we get the following data:

<table>
<thead>
<tr>
<th>Part of Body</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye</td>
<td>around 100 times</td>
</tr>
<tr>
<td>Mouth</td>
<td>around 100</td>
</tr>
<tr>
<td>Heart</td>
<td>118</td>
</tr>
<tr>
<td>Voice</td>
<td>84</td>
</tr>
<tr>
<td>Breasts</td>
<td>29</td>
</tr>
<tr>
<td>Face</td>
<td>30</td>
</tr>
<tr>
<td>Neck</td>
<td>36</td>
</tr>
<tr>
<td>Lips</td>
<td>28</td>
</tr>
<tr>
<td>Cry</td>
<td>20</td>
</tr>
<tr>
<td>Tremble</td>
<td>17</td>
</tr>
<tr>
<td>Belly</td>
<td>5</td>
</tr>
<tr>
<td>Breath</td>
<td>5</td>
</tr>
<tr>
<td>Pale</td>
<td>4</td>
</tr>
<tr>
<td>Sweat</td>
<td>a few</td>
</tr>
</tbody>
</table>

In subsequent research I will examine the verse in which these symptoms appear in detail and attempt to “code” the rabbinic corpus according to Scherer’s model of emotion. The Automap output allows us to get a global
picture of what aspects of the physiology of emotion the commentators focused on in Song of Songs and on what aspects they did not focus.

Conclusion

In this brief chapter I have presented what I think is a plausible way to incorporate methods from harder sciences into the study of religious texts. These methods could be quite useful with regard to other kinds of texts and can be easily replicated. I have argued that current research in the affective sciences can help us be more precise when talking about emotions in ancient texts. This may help us better understand the emotions both of the authors of ancient texts, in addition to the emotions elicited through reading them. I have done so without falling into the fallacy that human emotions are always the same across time and space; emotions are understood differently primarily because human reflection on emotion differs across time and space (what Scherer calls “appraisal”). Some emotions, however, and their physiological symptoms are consistent across the human condition, and these are the elements in the text on which I have focused. Combining a sophisticated (5 component) model of emotion with computer assisted data-mining techniques provides us with a new tool for analyzing Jewish texts.

In presenting these methods I want to be clear that they cannot replace traditional methods of literary criticism and analysis of these texts. In general I find that both “scientific” oriented scholars and anti-scientific scholars misunderstand one another quite deeply. I lot of the distrust between ‘scientists’ and ‘humanists’ relevantly has a lot to do with emotions at a very personal level: scholar A feels slighted or underappreciated by scholar B. While the scientific approach may bring us more precision and clarity in talking about emotions, because it tends to strive towards the impersonal, it does a poorer job in accessing the personal level at which emotions operate—the deep dynamic and interpersonal level of emotions we are constantly a part of as social beings. This chapter, to a large extent, addresses the question of how we can get at this complexity of emotion.

Another important misunderstanding seems to be with regard to vocation—that is, one’s calling. Methodological and theoretical lines between humanities and sciences are quite a bit more blurry than either side is usually willing to admit; what does distinguish the two, rather, concerns purpose. Humanists are not interested in producing knowledge for its own sake; rather, the goal is enlightenment or self-knowledge. Humanists are interested in the limits of knowledge. Science by contrast, in this rather idealized picture, has as its goal the production of public knowledge. These two projects should not be
threatened by one another, but rather compliment one another. The tendency thus far in cognitive approaches to traditional humanities fields such as the study of religion, has been to attempt to explain religion based on methods and theories imported from the sciences. In contrast, I hope a future humanities will utilize methods and theories from the sciences to carry out its traditional aim: enlightenment or self-knowledge.

Notes

1 I do not think Scherer means “relevance” in the same sense as Sperber and Wilson’s “Relevance Theory,” though the parallels are intriguing. Sperber and Wilson (1995) consider relevance an evolutionary calculation of the cost of processing information, but perhaps an emotional model of relevance would augment their theory.

Bibliography

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