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Title of presentation: Painting a bigger picture: the annotation of emotion in Middle Dutch literature

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Authors:

Cecile Vermaas, master student at Radboud University Nijmegen

Laurent Breeus-Loos, PhD-student in Literature at the University of Antwerp (Orcid: 0000-0002-9151-9734)

Mike Kestemont, professor in Computational Humanities at the University of Antwerp (Orcid: 0000-0003-3590-693X)

Presenter: Cecile Vermaas

Painting a bigger picture: the annotation of emotion in Middle Dutch literature

In the 14th century Dutch romance *De roman van Heinric en Margriete van Limborch* a classic stage is set: a girl finds herself lost in the forest and becomes very scared. This association of location and emotion is a well-known trope in medieval literature.¹ This is just one example of the many connections between aspects of literary texts and the emotions in those texts that are still to be unraveled.

Our project focuses on emotions in medieval epic and applies computational analysis to model them. Digital tools can deepen our understanding of how emotions are related to other aspects of medieval literature, such as correlations with narrative progression, time and place of composition or sub-genre, to name but a few. We are currently developing an instrument to analyze emotions in medieval Dutch epic, with the goal of analyzing the distribution of emotions in medieval Dutch literature in a larger-scale, serial fashion.

Apart from more conventional approaches, large, pretrained language models have become the method of choice for emotion detection in current natural language processing. Established foundation models are readily available nowadays (e.g. BERT), even for early modern language varieties (e.g. GysBERT). None are available for medieval languages however, let alone for the niche variety of Middle Dutch literature. Our research aims to correct this gap. We adopt a text classification approach to emotion analysis, where one from a series of mutually exclusive labels is assigned to a string of unnormalized Middle Dutch text.

We annotated a sample of Middle Dutch literature for emotion at the verse level. In order to minimize skewness, we narrowed the possible set of emotions down to seven. Ekman's original six emotions were deemed to be sufficient at first.² They are anger, disgust, happiness, sadness, fear and surprise. After an initial round of annotation on 1K lines from the above mentioned *Limborch*, we observed a need for a seventh emotion, 'longing' in the broadest sense of the word. We defined 'longing' as a sense of desire. This could be lust, or prayer or simply wishing someone would do something.

¹ Saunders 2015.

² Ekman 1972.

Another important decision we had to make was whether we would allow for multiple emotions within a single verse (multilabel setup). More complex emotions might be expressed through a combination of two basic emotions. For instance, when Margriete is faced with a bear in the forest, she prays to god to save her.³ This is a specific kind of praying, which is strongly based on fear. In this case it could make more sense to annotate both emotions than just one. We did the annotation trial again and decided against the possibility to annotate two different emotions. There were far less of these instances than we had anticipated and in those instances it was usually possible to choose a single emotion instead of two. Since it would make the annotating as well as the programming easier to work with a maximum of one hit per verse, we decided to limit ourselves to one emotion.

In order to train and evaluate an emotion classifier we estimated at least 30.000 annotated verses would be needed. These were carefully selected from the realm of medieval Dutch narrative literature. At a later stage it would be very interesting to also include prose and lyric, but for now a focus on one genre safeguards the feasibility of our approach. We did include a very wide range of medieval epic, including knightly literature, religious epic and some historical works. The texts were all taken from the *CD-ROM Middelnederlands*, a digital corpus containing a huge amount of the surviving medieval Dutch literary texts.⁴ A thousand subsequent verses were chosen from different parts of the literary works, if possible. Texts that were fragmentary or short in general, were selected as well, to ensure proper representation of the available texts. All texts were rhymed and were selected within a time frame of 12th-15th century, with a slight emphasis on 13th and 14th century literature. The origins of the literary works were located throughout the whole Middle Dutch speaking region, however, especially in the earlier centuries they stem mostly from the Southern regions.

We also performed an inter-annotator agreement test. Because the main annotations would be carried out by a single individual, we needed to establish the overall difficulty of the task. Therefore two of our team members annotated six samples of 200 verses of different Middle Dutch romances, annotating for each verse whether one of the seven emotions was present or none. Cohen's kappa for the annotations pairs was 0.45, indicating "fair to acceptable" agreement. In figure 1 Cohen's kappa is shown for all six individual samples. The stand out sample is the *Limborch*, which has a far higher score. This could be due to the fact that in previous testing the annotators used the same romance. Even though they annotated verses from a different book within the text, they did share their thoughts on how the emotions should be interpreted.

In figure 2 the absolute frequencies of the annotated emotions are shown. The majority of the annotations show 'NO', which means that there was no emotion attributed to those verses. There are cases of doubt within these verses: in the *Borchgravinne van Vergi* it is clearly stated that the countess is happy.⁵ In the following verse the reason for this is stated: she is pretty and rich. The question is whether this second verse should be annotated as 'happiness' or 'NO'. In this case, annotator C decided to include the verse and annotate 'happiness', where annotator L decided to annotate no emotion.

The full set of annotations will be used to train an emotion classifier. In the presentation we will be able to say more about the outcome of the project.

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³ *Limborch*, book 1, v. 167.

⁴ *CD-ROM Middelnederlands* 1998.

⁵ *Borchgravinne van Vergi*, v. 799.

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Figure 1: Cohen's kappa per individual text.

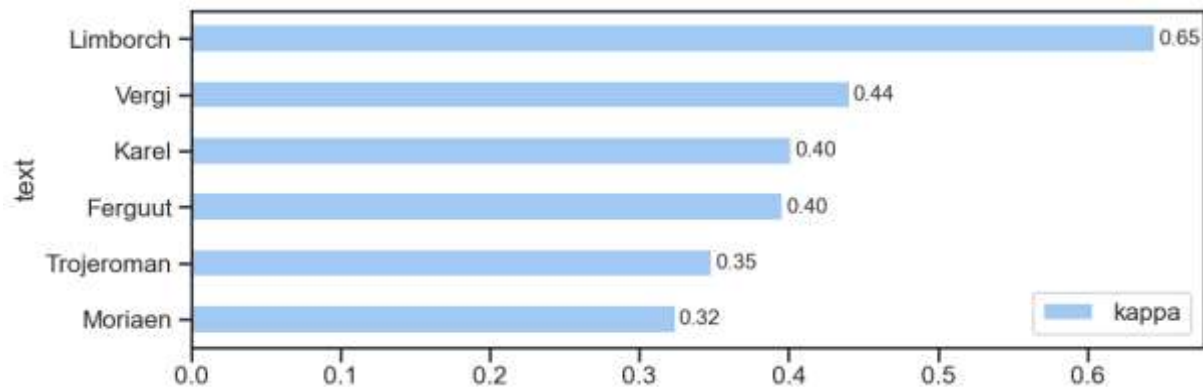


Figure 2: Absolute frequencies of emotion in the annotated samples (annotators L and C).

