Wowhead Online Discussion Forum:
What Causes a Message to Receive High Rating?

Pro Gradu -study

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ABSTRACT

The purpose of the study was to find out which attributes make messages posted on Wowhead forums (http://www.wowhead.com) receive high ratings. In the forum, users can give messages plus or minus votes thus indicating whether they like or dislike the messages. Votes are used to calculate rating, which was used in the as dependent variable.

Altogether, 1000 messages on Wowhead forum were selected and classified based on their rating, length, information content, writing style and humor content. The sample was analyzed using statistical correlation and regression analysis.

Information and humor were found to be the predominant kinds of content in messages. On average however, messages containing humor received better ratings and more votes. The study also suggests that it takes around 2.6 facts before an analysis of data is done. Almost similarly, it takes about 2.8 analyses before an opinion is formed.

The best ratings were given to messages that were short, contain humor, written fluently, and contain correct and useful information in compact format. Messages which contained information received lower ratings, whereas humor was the biggest factor contributing to high rating and false information to low rating.

In messages containing information, the importance of length was reversed and longer messages received higher ratings. This suggests that when transmitting information, message needs to be longer than otherwise. In addition, the importance of giving information in compact format (e.g. formulas, links etc) increased.

1 Glossary

Word	Explanation
Add-on	An external plug-in that can be used in WoW to perform tasks that is not included in the World of Warcraft software normally.
AOE	Area of Effect Damage. AOE-type spells deal damage not only to one mob at a time, but to every mob inside the range of the spell.
Boss	Computer controlled NPC possessing special powers. Killing bosses is one of the main goals in World of Warcraft.
Faction	A group formed by NPCs in the game world. Analogy of faction in real world would be for example freemasons.
Leet-language	Language used in modern communications to abbreviate words, replace letter by others etc. Especially used by the youth. For example "CU" for "See you" or "h3ll0" for "hello".
Lore	The stories and tales behind the game.
MMORPG	Multiplayer Online Role-Playing Game. A game played by a large number of people sharing common game world.
Mob	Computer generated and controlled enemies in the game world.
NPC	Non-Player-Character. A game world character generated and controlled by the computer.
Quest	A task that a player must perform inside the game world. They typically consist of killing monsters, finding treasures or saving somebody.
Spec	A way of altering the way a players character behaves. Users have a certain amount of talent points they can spend to enhance their skills.
Tauren	One of the character classes in the World of Warcraft. Mythological creature resembling Minotaurus.
WoW	World of Warcraft. The most popular online role-playing game in the world.

2 Introduction

2.1 Purpose of the Study

The purpose of this study is to find out which attributes cause a message posted in Wowhead discussion forum to receive high or low rating. The study topic was selected due to authors long term interest in information transmittal and its impact on the value of the message. This interest was already present in authors Bachelor of Science dissertation study, which concentrated on information transmittal compared to other types of messages, sent in an online chat.

The study found that in chat concentrating on information transmittal, the percentage of messages containing information was about 80% (Henriksson 1998). The result raised a question about the impact of information in messages, how it affects the users and usability of message, which is what this study attempts to address.

Furthermore, when searching for proper material, authors interest in computer gaming lead to select Wowhead as the forum. The rating system was already present, message base was very large and the quality of postings appeared to be higher than in competing forums.

The popularity of message in this study is defined as rating it receives when users give plus and minus votes to messages, thus increasing or decreasing the status of the message. It is expected that because message status also reflects the status of the sender, all the efforts are made to gain as high a rating by the authors as possible. Therefore, it is logical that users try their best when composing messages and also give votes on logical grounds.

The users voting also have it in their own interest to give justified votes. The purpose of Wowhead forum is to be a distribution channel of information for all the players. Because the rating messages receive from users can also be used to judge the correctness of the information as well as general popularity, it is against everybody’s best interest to vote informative messages down.

The factors examined in this study are highly generalized to find out distinctive differences between different kinds of attributes such as usage of humor, message length, style of writing and information content. General in this context means, that the variables were kept to high level instead of breaking them down to as small and accurate units as possible.

For example, humor was only divided in two main categories instead of using classification that is more sophisticated. Similarly, the original cognitive domain of Bloom's Taxonomy consists of six categories, out of which only three most general types were selected to be used in this study. The purpose is to highlight the major factors in message popularity, and not to examine the fine nuances of individual attributes. That would be scope for another study once the big picture is formed.

2.2 Previous Studies

During the study, an analysis of previous studies were made. However, it seems that the message popularity and contributing attributes have been studied very little or not at all. Most of the studies on the content of messages are done for various learning environments, mostly concentrating on effectiveness of learning.

An example of such research is a study titled “Effective Discussion Through a Computer-Mediated Anchored Forums” conducted by Mark Gudzial and Jennifer Turns (2000). In the study the author explores the features that an online discussion forum must meet in order to be efficiently used in online learning. However, even though superficially it may seem as only a different theme of the same idea as in my study, the difference is distinctive. The focus is in the forum itself, not the messages relayed by it.

Another study slightly more similar to mine is titled “How to structure online discussions for meaning discourse: a case study”. In this study, Patricia Gilbert and Nada Dabbagh (2005) examined the effect of structuredness in meaningful discourse. The study found that giving proper guidelines assisted facilitation and evaluation of online discussions and the quality of postings. However, this study also concentrated on the impact of message learning.

Noriko Hara, Curtis Bonk and Charoula Angeli (1999) examined mandatory instructor-student online discussions of a university course. The emphasis was on interactivity in message chains. However, once again the authors concentrated on the impact of learning. It was found that if the discussion starter (e.g. first message in chain) was steering the discussion into the right direction, student responses became more interactive over time. It was also found that students were using higher-level cognitive skills in the messages. The result is consistent with the large proportion of messages found containing analysis and evaluation type of information requiring higher cognitive skills in my study.

Even thought the studies on online discussions are numerous, it seems that no efforts on finding out what are the attributes contributing to popularity of a message has been made. Perhaps popularity has been too vague a term to inflict academic interest, or direct applications of research have been unclear. The most obvious applications would be found in general writing and advertising. In the latter case, popularity of message defines how efficient the ad is, therefore creating a clear need to find out how to format the message to ensure maximum impact on the receiver. However, because of the semantic difference between an ad and a forum message transmitting information, the goal of studies on advertising and this one is not identical.

During the study, it turned out that because very few studies have been examining the popularity of messages and the reasons, previous research was not very helpful. Most of the methods used in this study had to be constructed from the beginning and results cannot be easily cross-referenced to existing studies.

2.3 World of Warcraft

World of Warcraft (WoW) is the largest Multiplayer Online Role-Playing Game (MMORPG) in the world. As of the beginning of the year 2008, there were more than 11.5 million players (Blizzard Entertainment, 2008) worldwide, who each pay about 20€ every month for the right to enter this massive virtual world.

The game is about finishing quests, killing monsters and improving your gear. There can be thousands of other players sharing the same game world, and interacting with them is an important part of the game experience. Most of the activities require support of a group,

which means the social aspects are very important in the game. This has also been proven by studies (Griffiths, Davies 2004; Sherry, Lucas 2006).

Figure 1. World of Warcraft game world

2.4 Wowhead Forum

2.4.1 General

Wowhead discussion forum is one of the largest Web sites of its type in the world. It is created entirely for the World of Warcraft players, and it concentrates on information sharing between them. The site has an extensive database of all the character classes, achievements and professions. It contains information about everything the game has to offer. Users can browse through the database and for example, plan ahead which kind of items they want to obtain in the game. The key functionality, however, is the possibility to share information and to discuss various issues with other players using discussion forums found inside Wowhead.

Each database entry, for example, an item in the game world, has its own forum. Users can search for an entry they are interested in, and once they find it, see other users comments and add their own. Therefore, for example, if a user is interested in a certain quest, in the discussion forum of that particular quest, somebody might tell the coordinates where this quest can be completed in the game world. Another good example of the way the site can be used is for asking advice on whether the user should select one piece of gear over another or not. The answers are generally very well formulated and informative to help users in their decisions and problems.

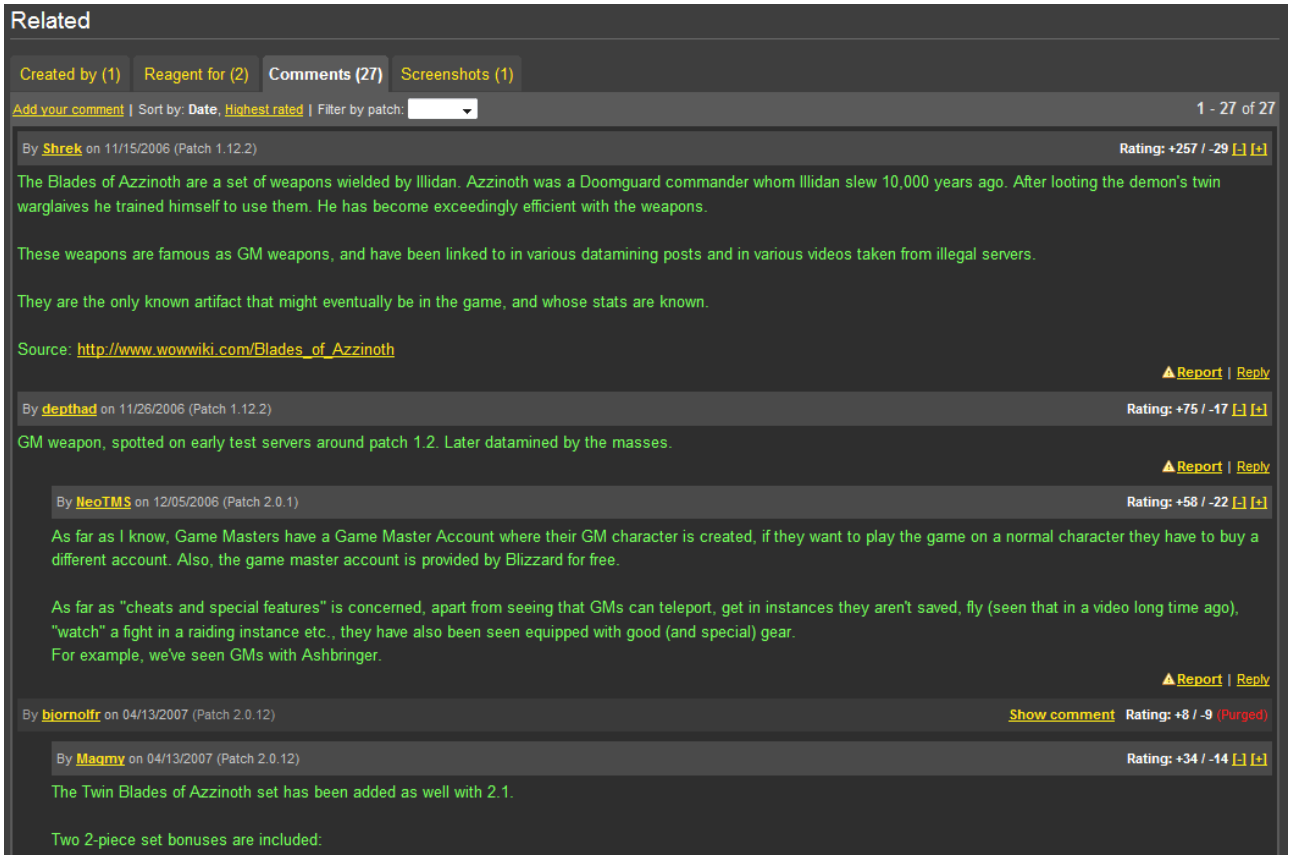

Figure 2. Wowhead main Discussion Forum window

2.4.2 Message rating system

For the scope of this study, the most interesting feature of Wowhead discussion forum, is that users can also rate the messages they read. This is done by logging into their account and issuing the message a plus or a minus vote. These votes change the status of the message and it becomes more or less visible to the users. All the votes combined together form the rating of the message. For example if ten users have given a message a plus

vote and five users have given it a minus vote, the final rating shown is five (10 - 5 = 5). It is also possible to click the rating to reveal the division of plus and minus votes, a feature that is used in this study to calculate the percentages of types of users liking and disliking the message.

Messages with less than certain rating threshold are hidden altogether from view, and users need to click a "show comment" link to see them. Eventually the low rated messages are completely purged, leaving them visible only in the index of messages. On the other hand, messages with rating higher than certain threshold will be colored to be more visible using a green color, and moved on top of message chains. The purpose of this is to make it easier for the users to find relevant information and to see popular messages first.

3 The Study

3.1 General

In order to make statistical analysis possible, the material needs to be analyzed and classified using variables. The variables were selected so that they represent a random message as thoroughly as possible in all the major aspects.

In their study titled "Interaction and Interpersonality in Online Forums", Alberto Beuchot and Mark Bullen had to overcome similar problems of selecting good variables to reliably describe the types of messages found in conference forums of doctoral program in Monterrey, Mexico. The authors opted to select twelve-category taxonomy to classify messages.

The categories that measured interpersonality in their study were support, disclosure, appraisal, humor, inquiry, inform-offer and other. As this study concentrates on finding the elemental building blocks of well-received messages, the fundamentally same major categories were included in variables. Beuchot and Bullen found that 54% of messages contained information (disclosure and inform-offer variables combined) and 4.1% humor (2005). The result clearly indicates that information and humor are the major building blocks of an online message. These two categories were found to be the most common elements if inquiries are ignored, as in this classification, due to their lack of information content.

The variables used in this study represent what could be called a "big picture" of attributes that can be found in the material. The goal is to be able to identify as well as possible, what are the attributes causing messages to receive high rating. The variables are divided into three main categories:

- General Variables
- Information Variables
- Style Variables

3.2 General Variables

Using general types of variables, it is examined if attributes of a message outside information transmittal and style have an effect in the rating a message receives. The following table lists the general variables, source from where they were derived, role in the study and scale used.

Variable	Source	Role	Scale
Rating	Wowhead	Dependent	0-1
Plus Votes	Wowhead	Dependent	0-1
Minus Votes	Wowhead	Dependent	0-1
For Percentage	Wowhead	Dependent	0-1
Against Percentage	Wowhead	Dependent	0-1
Voters	Wowhead	Both	Absolute
Message Length	Wowhead	Independent	0-1

Table 1. General variables

3.2.1 Rating

The rating comes directly from votes users have given. It is a mathematical sum of the users voting either plus or minus for the message. Every user has only one vote and once they have cast a vote, it cannot be altered later. The sum can be positive or negative depending on the votes. Messages that receive negative rating will eventually be purged from the database.

The absolute rating of a message is converted into a scale of 0-1 by using linear re-scaling of the original values. The following table illustrates how this is done using formula: scaled value = (value - min value) / (max value + min value).

Value	Calculation	Re-Scaled
-10	(-10-(-10) / (10+10)	0.00
-5	(-5-(-10) / (10+10)	0.25
0	(0-(-10) / (10+10)	0.50
5	(5-(-10) / (10+10)	0.75
10	(10-(-10) / (10+10)	1.00

Table 2. Re-scaling example

Using linear re-scaling the minimum value of the range always scales down to zero and the maximum value to one. Linear re-scaling is used to preserve the variation and differences between the values and to allow easier analysis of the data.

In some cases, the rating does not reflect the division of the plus and minus votes well enough. For example, if ten users give a message a plus vote and three give it a minus vote, the final rating will be the mathematical sum of the numbers, which is seven (10 - 3 = 7). Another message could get the same rating of seven, but the division of the votes could be completely different, for example, 100 plus votes and 93 minus votes (100 - 93 = 7). However, it can be argued that in the first case, a much bigger percentage of the users liked the message than in the latter. To avoid the problem two more variables, for percentage and against percentage, which define the accurate division of votes, were added in the general variables.

3.2.2 For Percentage

For percentage variable defines what percentage of users voted that they liked a message. The percentage is preserved in a scale of 0-1 to keep all the data uniform in range for easier and more accurate analysis. For example if 50 users votes plus and 10 users votes minus, for percentage is 0.8.

3.2.3 Against Percentage

Against percentage variable defines how many users voted they disliked a message. The percentage is preserved in a scale of 0-1 to keep all the data uniform in range for easier and more accurate analysis. For example, if 50 users votes plus and 10 users votes minus, against percentage is 0.2.

For and against percentages are in principle measuring the same variable, even though they are separated. For this reason, it is not always necessary to examine both variables, but only the most significant one.

Sometimes it is also beneficial to be able to examine the absolute number of plus and minus votes, for example to distinguish situations when an unusually large number of

users are giving minus votes, even though the percentage would appear normal. This could be for example, in case a messages content is something that strongly divides the users in their opinions, such as tendentious humor. To measure the absolute number of plus and minus votes the following two variables were added to data.

3.2.4 Plus Votes

The plus votes variable defines how many users voted that they like message. The value is the absolute number of plus votes given. The value is re-scaled to a scale of 0-1 in order to keep all the data uniform in range for easier and more accurate analysis.

3.2.5 Minus Votes

The minus votes variable defines how many users voted that they dislike message. The value is the absolute number of minus votes given. The value is re-scaled to a scale of 0-1 in order to keep all the data uniform in range for easier and more accurate analysis.

3.2.6 Voters

The number of voters variable was selected in this study to find out how the number of voters correlates with the rating. Do the users reach consensus and vote similarly, which would be indicated by positive linear correlation between the number of voters and rating, or do they disagree, thus leading into lack of correlation. In a way, the correlation between the number of voters and message rating could also indicate that the value of a message to users is universal and uniform.

Number of voters can also be used to indicate how many users read the message, as it is logical to assume that the more users read it, the more a message receives votes. Therefore, voters can be used as a simple method of measuring message readability and popularity. Absolute number of voters, before the subtraction to get the rating is done, is derived from the material by adding the number of users voting for with the number of users voting against message.

The number of voters is only used occasionally in this study to stress some other point, as the main focus is to examine what makes a message receive a high rating. To visualize values better, re-scaling was not applied to this variable. Therefore, the values are in absolute format.

3.2.7 Message Length

Message length is an important variable because it can enable transmittal of a large amount of information. On the other hand, if the message is short, the ability is greatly reduced, except in a case of extra information, which can carry a large amount of information even in a message of very compact size (coordinates, formulas etc).

This variable is also derived from the message by counting all the words. Only individual words count. Spaces, linefeeds, special characters like exclamation marks and quotation marks are not counted. In case a hyphen is used between two words, it is only counted as one. Definition of a word in this study is considered to be any number of characters divided by space.

The words are counted directly in Excel where material is analyzed, using the following formula, which trims the words so that the spaces are ignored:

"=IF(LEN(TRIM(cells))=0;0;LEN(TRIM(cells))-LEN(SUBSTITUTE(cells;" ";""))+1)"

The absolute length of a message is also converted into a scale of 1-0 using linear re-scaling in the same way as the score of the message. If the real length of a message is needed in order to better visualize results, it is calculated by converting re-scaled value back to original.

3.3 Information Variables

3.3.1 General

The concept of information used in this study is that of semantic information (Bar-Hillel 1973) combined with pragmatic information. Therefore, to be categorized as containing information, the message must have a meaning and it must convey knowledge of some kind to the receiver, in a form that is possible to understand.

In this study, simple opinions are not counted as information, unless they are based on solid information, which is also presented. The reason is that the forum is most of all intended to function as an information sharing channel, and therefore for the users facts are more valuable than simple opinions. Well-formed and justified opinions are however, counted in evaluation variable.

Information variables are used to determine how transmitting different kinds of information in a message correlates to the final rating it receives. The different kinds of information types are adopted from the classification known as Bloom's Taxonomy (Bloom, Kraftwolh, Masia 1971).

The original Bloom's Taxonomy contains three different domains. Cognitive domain measures knowledge and mental skills and is therefore the main focus in this study, which concentrates on information. Affective domain measures attitude and psychomotor domain both manual or physical skills. The domains reflect the origin of the classification system, which is in learning studies.

In the cognitive domain, there are six different categories, which are arranged in order from the simplest (knowledge) to the most complex (Evaluation). The following table illustrates the original Bloom's Taxonomy of cognitive domain:

Category	Example
Knowledge	Recite a policy. Quote prices from memory to a customer. Knows the safety rules.
Comprehension	Rewrites the principles of test writing. Explain in ones own words the steps for performing a complex task. Translates an equation into a computer spreadsheet.
Application	Use a manual to calculate an employee's vacation time. Apply laws of statistics to evaluate the reliability of a written test.
Analysis	Troubleshoot a piece of equipment by using logical deduction. Recognize logical fallacies in reasoning. Gathers information from a department and selects the required tasks for training.
Synthesis	Write a company operations or process manual. Design a machine to perform a specific task. Integrates training from several sources to solve a problem. Revises and process to improve the outcome.
Evaluation	Select the most effective solution. Hire the most qualified candidate. Explain and justify a new budget.

Table 3. Bloom's Taxonomy of cognitive domain

In this study, the classification is simplified from six original categories into three main ones, which are needed to describe information content in the majority of the messages studied. This enables the differences between the categories to become more apparent and classification into variables to be easier and more precise. Each message can contain one, two or all three kinds of information.

The reduction in categories was also partly done to ensure that the sample size is large enough for meaningful statistical analysis. Also, it can be argued that for the users, the fine distinctions between application and analysis would not be apparent enough to create differences in their rating. However, in the selected categories, the differences are big and the continuum from knowledge towards forming of opinions via analysis is very simple and distinctive.

In case of a simple statement which holds no information whatsoever, zero value will be assigned to the entire information variable. For example, the following statement holds no information:

“Am i the only one who feels reminded to Achmed the dead terrorist? "That's no car (mount), that's a lunchboxchs!"

The following table lists the information variables, source from where they were derived, and the role in the study and scale used.

Variable	Source	Role	Scale
Extra Information	Henriksson	Independent	0-1
Knowledge	Bloom	Independent	0-1
Analysis	Bloom	Independent	0-1
Evaluation	Bloom	Independent	0-1

Table 4. Information variables

3.3.2 Extra Information

Extra information variable indicates that there is some special type of information in the message. In Wowhead, many messages typically contain information about macros, location of certain events, items or links to other articles and videos. This type of information cannot always be accounted for by using three information variables derived from Blooms taxonomy.

The difference between other types of information content and extra information is subtle. For example, coordinates given in a message are always counted as both knowledge and extra information. However, coordinates can always be expressed in two different ways. The following two messages are identical in their information content (they both contain location of furbolg NPCs):

"Bristlelimb Furbolgs can be found south of Exodar in Bristlelimb Village, near the strait between Azuremyst Isle and Silvermyst Isle, just north of the village on the plains surrounding it"

"Bristlelimb Furbolgs can be found in Azuremyst Isle, coordinates are 26,65"

The first message points to the furbolgs using complicated instructions that require users to examine their map and deduce the actual location from the description. The second

message uses coordinates, which is a superior way from users perspective. Information transmitted is exactly the same, but for a user the second message value is probably higher due to the fact the instructions are easier. Both messages are classified as containing knowledge, but the latter is also classified to contain extra information (coordinates).

Extra information variable was added to find out if the way information is presented has an impact on message rating. Considering that the users of Wowhead appear to be well educated and thus capable of interpreting information, it was expected that this type of compact information in raw format would be well perceived.

In a study titled "The Effects of Knowledge, Motivation, and Type of Message on Ad Processing and Product Judgments", the authors examined how novice and expert users (of the product in question) processed ads containing information about product attributes and benefits. It was found that the experts were more likely to process a message in detail when given only attribute information, while novices were more likely to do so when given benefit information (Maheswaran, Sternthal 1990). The experts ability to take raw facts and form an opinion about possible benefits made attribute information more valuable for them. Exactly the same mechanism should cause expert members, which appear to form the majority of Wowhead users, to appreciate compact information more than longer explanations.

Another study concentrated on feedback given to university students by their peers and faculty members. Students had to rate the feedback based on its usefulness to them. It was found that students rated direct feedback giving exact instructions on how to improve their essays the highest (Cho, Schunn, Charney 2006). In Wowhead the closest analogy of direct answers would be giving extra information, an exact and compact answer without further explanations and justifications. Therefore, in the light of previous studies, it is important to find out if this kind of information receives better ratings than other types.

Most of the extra type of information is also classified as knowledge, but in some cases such as the links that do not contain any information (for example humorous links) the

classification may be unique in information category. The following quote is an example of a message containing two other types of extra information (macro and link):

“So, because of this i simply made a macro that looked something like:
#showtooltip taunt
/cast taunt
/in 10 /rw first interrupt
/in 20 /rw 2nd interrupt
/in 24 /rw 3rd interrupt
/in 29 /rw 4th interrupt

I interrupted casts 1 and 3, our resto shaman and 1 fury warrior both tried to interrupt 2 and 4, using the early raid warnings as a guide. In the end our chat window looked a little bit like: http://i44.tinypic.com/2pr8vt1.jpg”

The exact type of information classified as extra information is highly Wowhead-related, but the concept can also be adapted to wider use by making necessary adjustments. The following lists the types of information classified as extra information in this study:

- Coordinates (only those in numbers, verbal directions are not counted)
- All links (even if a URL is not visible)
- Mathematical formulas (except when numbers are spread around the message)
- Macros (WoW scripts to perform a function)

3.3.3 Knowledge

This type of information means simply stating a fact. However, it does not require the fact to be universally known. In fact, the value of information is higher the less widely known it is. In a message this might mean in practice for example, displaying coordinates or quoting some other source. A typical example of a message containing only knowledge type of information is the following:

"These guys are around the area of 42.38 - they look like elementals kind of"

The writer is stating a simple fact that he possibly found out by himself, being in the right place at the right time and finding the mobs in question at the coordinates given. He is also giving information about what the mobs look like, directly from his own experience.

Knowledge was taken into study as a basic unit of information, which enables more complex categories of information to be transmitted. As it is impossible to form justified opinions or make fact-based analysis without knowledge, it is an elementary part of every message containing any type of information. The rating of messages containing knowledge should reveal if the users are seeking a simple kind of information or some other kind, or in fact, if they are seeking information at all.

When facts are simply stated without any judgments or decisions to back them up they are categorized as knowledge. Examples of knowledge type of information in the context of Wowhead forums are listed in the following:

- Simple facts
- Coordinates
- Quotes from other sources containing information
- Links to sites containing information

3.3.4 Analysis

Analysis type of information means taking known facts and using or combining them together to form a new kind of information. To be able to do this, the user must understand the value of the information he is using and also know what kind of outcome is beneficial. This category includes mathematical calculations when they are not copied straight from somewhere else. The following is a typical example of a message containing analysis:

" i went improved faerie fire for the hitrating at the cost of trees and starfall. so i drop a little dps but all other casters hit rating goes up. i think thats an additional 72 hitrating for all other casters. thnx for tips on cast order"

The author of the message knows that getting improved faerie fire talent, even though he is losing some damage per second (the measure of a players efficiency in battle) by losing two other spells, it is beneficial for the whole group. He sacrifices some of his own damage to boost that of the others. Realizing this requires him to calculate damage output from two different sources, to combine it into overall damage, and then decide that for the good of the group he needs to do the sacrifice.

The following is a list of examples of information belonging to analysis category:

- Mathematical calculations when they are used to analyze data
- Combination of facts into new one
- Analyzing facts to create new one

3.3.5 Evaluation

Evaluation means using known facts to form opinions, judgments and decisions. In a way, evaluation means that information is used for something, not just simply stated for its own sake. The usage of information is how it differs from analysis. When mathematical calculations are used to form or stress an evaluation, they belong to this category. The following is a typical example of a message containing evaluation:

"feralmir your spec looks good but one thing i dont understand is that why do you have owlkin frenzy, you really should not be getting hit in a raid."

The writer acknowledges the fact that the person he is responding to is playing a Druid class. Then he wonders why the person in question has taken owlkin frenzy spec (spec in World of Warcraft is users way of altering the way his characters behaves), which is only beneficial if the player is hit. Then he proceeds to form a judgment that since the person in question is raiding, he should not be hit at all, and therefore he does not benefit from owlkin frenzy spec.

In some rare cases, it is possible that a message is classified as containing evaluation type of information but not analysis. This happens only when the message contains opinions based on results of analyzing data, but how the analysis was done is not

explained. The following is a list of examples of information that belongs to evaluation category:

- Opinions that are based on calculations
- Opinions that are based on facts
- Opinions that are based on analysis

3.3.6 Misinformation

Messages containing clear misinformation are given misinformation classification. If a message does not contain information that is useful to the recipient, it does not add anything to his current knowledge and is classified as containing misinformation.

In practice, misinformation in this study means that the message contains semantic information but does not contain pragmatic information. For example, consider the following hypothetical message:

“The sun is blue.”

The message contains valid semantic information, which is measured as number of contradicting states that the information excludes. Therefore, the above message for example excludes states: “sun is red” and “sun is yellow” and thus contains semantic information (Niiniluoto 1996). However, because the information the message contains is invalid, it does not contain any pragmatic information, which is measured as the meaning and importance of the message to the receiver (Niiniluoto 1996).

Another example of a message containing misinformation is taken from the study material:

“I can confirm that in outland, with 225 riding the mount will go 60% in air and 100% on the ground. It says it also when you hover over the mount's buff in that situation.”

The message contains semantic information (with 225 riding the mount will go 60% in air and 100% on the ground). However, because in fact the mount will go 150% in the air and

100% on the ground it does not contain any pragmatic information and therefore is classified as misinformation.

Due to difficulty in classifying the misinformation accurately, because of the vast possible data set the game world holds, it is often necessary to simply examine the follow-ups and verify the existence of misinformation that way.

The following are examples of misinformation in messages:

- A fact that is clearly incorrect
- Coordinates that are deemed incorrect by follow-up messages
- Information that is deemed incorrect by follow-up messages

3.3.7 Summary

Extra information means the message contains one of the items listed in the end of the extra information chapter (coordinates, mathematical formulas, links or macros). Knowledge means the message contains simple facts that are just stated and not used for any analysis or the forming of opinions. Analysis means there are facts in the message and the facts are used for further analysis. For example, logical reasoning to create a new kind of fact. Evaluation means that analysis or facts are used as the basis to an opinion, which is stated in the message.

The rule of thumb is that, by definition, there can be no analysis without facts,. Similarly, it is very rare that evaluation can be made based on facts without also stating the analysis that leads to the evaluation. Therefore, in a great majority of cases the path knowledge -> analysis -> evaluation is cumulative.

3.4 Style Variables

Style of writing is analyzed by classifying it into two categories according to two hypothetical users. The users are given imaginary style in which they write their messages and each message is classified in either of these categories.

There can be little doubt that writing style affects the message value. In a book “The Technical Writer's Handbook: Writing With Style and Clarity”, Matt Young (2002) stresses the importance of writing in an easy-to-understand way, using short, clear sentences. In case the author fails to do this, Young says, there is a danger that even a good message can be ignored if nobody can understand the meaning.

In this study, the message style is simplified into just two categories in order to make the differences as distinctive as possible. A message can only belong to one category because the styles are mutually exclusive. In case a message is very short, the classification is done simply based on the spelling of the words.

Variable	Source	Role	Scale
Professor	Henriksson	Independent	0-1
Student	Henriksson	Independent	0-1

Table 5. Style variables

3.4.1 Professor

Messages belonging to this category are written in immaculate language. There are no spelling errors present and no leet-language, which means modern way of abbreviating words, for example “cu” meaning “see you” (LeBlanc 2005). The message is written in a way that is easy to comprehend. The structure of the message is clear and well defined and the language used is fluent English. The following is an example of a message that belongs to this category:

"Very easy fight, the boss has 2300k HP (10 man). You need two tanks. The first phase is a tank and spank, he will throw patches of stone shard which you need to stay out of. Then he will jump across the room and a storm cloud will come out, the 2nd tank needs to grab aggro and pull him out of it. Rinse and repeat, dropped s5 warlock and mage gloves."

The writing in this message is fluent and well formed, there are no spelling errors and the sentences are easy to follow. The abbreviations used are limited to those generally used in the World of Warcraft speech, which is acceptable since often there are no other ways of expressing these terms.

In some messages, it is obvious that the author knows exactly how to write fluently but uses less well-defined language to enhance the text or emphasize a point, often to make the message ironic. This usage of text is easy to identify, as the style of the message is partially very different, creating an inconsistent effect. In this case, the message is still classified as professor-style. In a way, all the messages lacking student category characteristics are classified as professor-style.

3.4.2 Student

This category contains all the messages that are written in a poor manner. Messages contain some spelling errors and leet-language words or abbreviations are used. Typically, sentences in these messages belonging to this category start with small letters and the punctuation is incorrect. The message is not as easy to understand as it could be. Here is an example of this category message:

"For all of you noobs who havnt ran this yet he drops t7 and s5 and 6"

In this message there is one leet-language word (noobs) and one spelling error (havnt). Punctuation is not used, which makes the sentence difficult to understand.

A study conducted by Larry Beason (2001) concentrated on business people's reaction towards different kinds of errors in text. The results showed that negative reactions to text fragmentation and misspelling are the strongest (the former was ranked as definitely bothersome and latter between somewhat bothersome and definitely bothersome). Student-style variable, measuring exactly these characteristics of text, is therefore well suited to examine a users reaction towards badly formatted messages.

The following are examples of contents belonging to this category:

- Leet-language
- Abbreviations not widely used in World of Warcraft community
- Text-walling (long sentences without punctuation, no paragraphs)

- No capital letters used
- Too many capital letters used
- No punctuation or punctuation incorrect

3.5 Humor Variables

There are a lot of controversial opinions and study results about effect of humor in a message. Engel, Wales and Warshaw (1971), citing a study made by Schwerin Corporation, concluded that some humor is better than no humor at all. On the other hand other studies suggest that employing humor in a message is always a risk and the results are disastrous if the humor is not understood (Phillips 1968).

Because the user base of Wowhead forum is expected to be fairly homogenous, it is probable that the users reaction towards humor is consistent. This enables humor to be a very strong candidate for correlation with rating, especially when it is classified into high-level categories.

Sigmund Freud (1905) classified humor into innocent and tendentious. The classification is well suited to form the main categories found in Wowhead, because all the humor found in messages can be classified into either or. It is also high-level enough to provide clear distinction between the different types. Furthermore, studying messages reveals, that most of them contains only innocent humor or tendentious humor, not both, so this classification method is perfect for independent variable. However, if a message contains both types of humor, then the message is classified into both categories.

All the messages having smileys are categorized to have humor of either kind. Using a smiley means that the author meant part of his message to be a joke, even thought it might not always be obvious which part. Because humor is often very subjective and a sense of humor greatly differs between individuals (Omwake 1937), it is important to try to classify humor as neutrally as possible to maintain the original meaning of the author.

Variable	Source	Role	Scale
Innocent Humor	Freud	Independent	0-1
Tendentious Humor	Freud	Independent	0-1

Table 6. Humor variables

3.5.1 Innocent Humor

The kind of humor that is typically a play on words, which does not offend anybody. According to Freud (1905), innocent humor is the kind that does not fulfill deep psychological function. It is the type of humor that is there only for the sake of it. The following is an example of a message containing innocent humor:

"It's amazing that a LV 58 items suddenly gets this much stats and damage just because it was sharpened"

The person makes comments on the name of a dagger, which claims that the item was sharpened and is surprised that simply sharpening it yields so much more damage. The suggestion of the message is that either the item was badly named, or the person who sharpened the item has found a new, more efficient method of sharpening. The joke is very much play on words and cannot offend anybody.

3.5.2 Tendentious Humor

The kind of humor that might offend somebody. According to Freud (1905), tendentious humor permits repressed desires to be voiced. This type of humor is a disguise for more serious impulses. Typical tendentious humor targets some social group, opinion or value. Here is an example:

"Tauren. Nothing like a bear with horns to scare the shit out of somebody."

The author is mocking one of the character classes in WoW. He or she states that the Tauren class looks a little bit like bear, but unlike a bear it possesses horns. Then he or she uses this unlikely combination to mock the whole class by using irony.

All the humor that could potentially offend somebody is categorized as tendentious humor. It does not matter if the potentially offended person is real or an in game person. Therefore, even the following message is classified to contain tendentious humor:

"Imagine if you could do that to raid bosses, like the lich king.
You dare to challenge the might of the...
Shut up biatch, come here!"

The person being insulted is The Lich King, who is an imaginary, very powerful in game character. Because the tone of the joke is tendentious and it might insult The Lich King, the joke is categorized as tendentious.

Irony and sarcasm falls inside this category as they often contain insults directed at somebody, disguised as humor (Wikipedia. Sarcasm, Irony 2010). Both categories of humor are common in discussion groups because people contributing have vast differences in opinions and it is easier to express the controversies strongly in anonymity provided by online discussion groups (Lange 2003).

3.6 Classification Example

The following is an example of a classified typical message, which is taken from the actual study material. The example illustrates how the non-computed variables are determined. All the rest of the variables used in the study are computed from the values presented. The following is the example message, which is slightly modified to fit a smaller space:

“crystal - 66, 59 (top of the pillar). for those who can't fly, path up starts at 70, 58 (to the right of the cave entrance).

*around 25, 80 for the mobs, you can kill 'em easily enough w/out using the crystal but the crystal will give you a 10 minute buff that heals you for crazy amounts every time you deal dmg... i imagine it'd be especially handy for an aoe-happy class ^_^*

turn in: 33, 75. reputation gain is either incorrect or out-of-date, the quest actually gives 700 - not 350.”

The message is classified as follows:

Information				Style		Humor	
Ext. Inf.	**Know.**	**Ana.**	**Eva.**	**Professor**	**Student**	**Innocent**	**Tendentious**
1	1	1	1	0	1	1	0

Table 7. Example classification

The message contains extra information because some coordinates in number format are given (crystal – 66. 59 etc.). Coordinates can be used in the game world in conjunction with WoW add-ons to easily navigate to locations mentioned in the message. Using coordinates in any format in a message also conveys knowledge, on top of extra information.

Analysis of information is done in the middle of the message: "*you can kill 'em easily enough w/out using the crystal but the crystal will give you a 10 minute buff that heals you for crazy amounts every time you deal dmg".* In this paragraph, the user acknowledges that it is possible to kills the mobs without the use of a crystal, but that using crystal will make it easier.

Evaluation is found in the end of the paragraph after the analysis: "*i imagine it'd be especially handy for an aoe-happy class* ^_^*".* The user forms an opinion that because the buff of the crystal heals the character every time he or she deals damage, it is especially useful for AOE-happy classes such as Mages and Warlocks. AOE deals damage to several mobs at the same time, as opposed to just one, causing large healing due to the crystal buff.

The message is full of abbreviations ("*kill 'em", "w/out*"), sentences starting with small letters *("i imagine")* and leet-language *("*^_^*").* The language used is difficult to understand and the message is generally written badly. Therefore, it is classified in student category.

There is clearly humor in the message ("*i imagine it'd be especially handy for an aoe-happy class* ^_^*")*. At least it was intended as such by the author, which can be determined by his or her use of smiley in the end of message. The humor is on the

threshold of irony but, because it is not actually targeted at anybody and thus cannot hurt anyone, it is classified as innocent humor. In this case, the difference between innocent and tendentious humor is not very clear and it is impossible to determine if the author meant his or her remark about AOE-happy classes as irony or as an innocent joke.

4 Classification Study

4.1 General

In order to study the clarity of the variable scale used as well as the generality of the classification process, a preliminary classification study was conducted. In the study, three people read the definitions of variables and instructions on using them to classify messages of Wowhead Forums, and then proceeded to classify ten randomly selected messages. The classification was done in an Excel form provided, in which the selected messages were presented and classification was marked (Appendix 1).

Before the classification study was conducted, an average target accuracy level was set to 80% minimum, meaning that participants should agree on variables in more than 80% of cases. This was done to ensure that statistically significant results can be acquired and the results would be repeatable in other studies. The average accuracy target level was reached as the study indicated 83.75% accuracy after one iteration round, during which the instructions and descriptions of variables were significantly improved.

4.2 Participants

The people participating were all high school graduates and one of them was studying in the Department of Computer Science in the University of Tampere. Two of them were already graduated. Only the author had studied information science. Below is the table showing important information about the participants:

Alias	Age	Degree	Experience in WoW
R (Author)	40	BSc	> 5 years
J	38	MSc	> 5 years
W	38	High school	> 5 years

Table 8. Information of the classification study participants

4.3 Results

4.3.1 General

The results of the study show, that even though there is room for improvement in the explanations, the results are highly consistent. The participants completely agreed on the classification of 67 cases. It must be remembered that an empty classification is just as important, meaning the lack of attribute in a message is equal in importance to finding the attribute.

Altogether there are 80 cases (eight attributes in each ten messages) in classification study, which translates to percentage of complete accuracy to be 100 - (13 / 80 * 100) = 83.75%. In the calculation, 80 is the number of all cases and 13 number of cases in which participants disagreed (80 - 67 = 13).

If the cases where only a single participant disagreed with others are omitted, the accuracy increases to 100 - (6 / 80 * 100) = 92.5%. In other words, this means cases where the majority of participants agreed on attributes.

Variable	N	Mean Accuracy	Standard Deviation
Extra Information	10	100.00	0.00
Knowledge	10	100.00	0.00
Analysis	10	93.33	14.05
Evaluation	10	83.33	28.32
Professor-style	10	83.33	28.32
Student-style	10	86.67	23.31
Innocent humor	10	96.67	10.54
Tendentious humor	10	93.33	21.08

Table 9. Classification study results per message

The table below lists all the messages in the classification study. One message equals one row and the numbering starts from three because the numbering is such in the Excel-form. Each participant was assigned abbreviation and their classification study answers were

placed in the table using abbreviation. Three letters in a box indicate that everybody agreed on the message attributes, two that only one disagreed and so on.

#	Extra	Know.	Ana.	Eva.	Prof.	Stu.	Inno.	Tend.
3		RWJ			RWJ			
4		RWJ	RWJ			RWJ	RWJ	
5	RWJ	RWJ	RWJ	J	RWJ			
6		RWJ	RJ		W	RJ	RW	J
7		RWJ	RWJ		RW	J		
8	RWJ	RWJ			RWJ			
9		RWJ	RWJ	W	RWJ			
10		RWJ			RWJ			
11		RWJ			R	WJ		RWJ
12		RWJ	RW	RW	RWJ		RWJ	

Table 10. Classification study results per message

When the results are compared in tabular format, it is evident that a large percentage of participants agreed with the classification.

4.3.2 Information

As expected, the higher the cognitive type of information is examined, the more participants disagreed on the message content. This is mostly caused by the difficulty in recognizing the more complex information types, as well as a need for further calibration of what kind of information is classified as analysis and evaluation in different contexts. Extra information and knowledge are easy to analyze and the consistency percentage is indeed 100%, meaning everybody agrees.

The number of different ways analysis and evaluation can be performed poses a real problem. Nevertheless, the agreement level in the most complicated type (analysis) is still 83.3% with standard deviation of 28.3, which is a satisfactory level. This is also the highest deviation in the any variable examined in the classification study.

4.3.3 Style

Accuracy in style variables is also in good level, even though there is more deviation than in information variables. It is mostly caused by the nature of classifying writing style – it is somewhat subjective and the most important thing is to calibrate the scales. For example the following message was classified as professor-style by the author but as student-style by other participants:

“That's Illidan, I-l-l-i-d-a-n”

The reason for different interpretation lies in the spelling name of the boss. Other participants interpreted that as a sign of immature language. However, they did not take into account the part in the instructions defining that deliberate leet-language, spelling errors etc. do not cause a message to be classified as student-style, if it otherwise falls into professor-style category. Also, very short messages are sometimes difficult to classify, as the trends in the use of language are not clearly visible.

4.3.4 Humor

Classification of humor was highly consistent throughout the classification study, with only minor differences. There was some deviation but overall accuracy was better than 93% in both types of humor. Notable observation is, that all the participants agreed on messages containing or not containing humor. Only the type was disagreed in one case:

"Interestingly enough, Kel'thuzad's phylactery doesn't even show up in Naxx 25... meaning he'll most likely be back. AGAIN. Naxxramas was merely a setback! ....twice."

Previous message was classified to contain tendentious humor by one participant, but as innocent humor by the others. It is likely that the disagreeing participant interpreted the message as an insult towards Kel'Thuzad. In many cases, it is very difficult to interpret whether the author meant humor to be innocent or tendentious, and quite often previous messages need to be taken into account.

Alberto Beuchot and Mark Bullen call interaction in messages, which refer implicitly or explicitly to a message posted before, reactive (2005). In Wowhead forum the majority of

the interaction is what Beuchot and Bullen call active, meaning messages do not refer to other messages. Due to the nature of Wowhead as an information sharing channel more than a pure discussion forum, the majority of active interaction is expected. However, in some cases presence of reactive messages might still cause trouble as in the example above.

In the same study, Beuchot and Bullen also conducted pilot study, in which three people classified online discussion forum messages according to instructions. They found that out of all the variables, humor was the most difficult to classify (Beuchot, Bullen 2005). In their study, the equivalent of innocent humor was found in eight, four and two messages by three different people. Tendentious humor was just slightly easier to detect, as it was found in eight, ten and twelve messages. As Beuchot and Bullen lacked information variables in their classification, this result is consistent with this study.

4.3.5 Conclusion

Even though 100% accuracy was not reached in the classification study, it is in good level. Some deviation was observed in the classification of messages into different variables inside categories, but participants agreed 100% on higher-level characteristics. The presence of information and humor was recognized without disagreement in all the messages. The deviance in variable types was expected as the classification is somewhat subjective and the precise usage of instructions would require some further calibration. The average accuracy was, nevertheless, well within the target limits.

5 Material

5.1 General

The material used in this study was collected in week 8-12.2.2010 in Wowhead discussion forum (http://www.wowhead.com). Altogether, 1000 messages were classified during the week. It took 14 hours to classify all the messages yielding average processing time of 51.2 seconds per message. All the breaks are subtracted from value, meaning only the effective work time is counted. The material selection criteria is discussed in the next chapter.

There is altogether 2 001 045 posts in the Wowhead forums (Cournoyer 2010), which means the sample taken represented approximately 0.5 per mil of the full message database. The number of messages was obtained directly from Guillaume Cournoyer, the creator of Wowhead discussion forum, in Facebook correspondence.

The average number of users giving votes for each message in my data was 44. The average number, however, does not represent the total average number, because only messages having more than 10 voters were accepted in the study material. Message chains with only a single voter were commonplace and the real average value of voters per message is in reality, significantly lower.

5.2 Material Selection

Wowhead discussion forum consists of various classes of quests, items, achievements etc. A single thread is meant for discussion of one item, quest or other type of entity only. Moderators take care of limiting the discussion in case inappropriate topics arise.

The forums are arranged based on the following main categories, which are divided into further sub-categories: Items, Item Sets, NPCs, Quests, Zones, Spells, Achievements, Objects, Factions, Titles, Hunter Pets, World Events.

Due to the large amount of data in the database, it was impossible to use full material. Therefore, a sample of 1000 randomly selected message chains was selected and classified using the defined variables. The chains were selected so that they represented all the different main categories to make the sample as comprehensive as possible. The chains were selected using two methods:

- Manual random
- Author based

5.2.1 Manual Random

Manual random selection was done by browsing around the different main categories looking for promising message chains. Promising in this context means long message chains with lots of high and low ranked messages that do not contain criteria used to abandon the message from being classified. When such a message chain was found, it was thoroughly analyzed and the next chain was selected.

5.2.2 Author Based

In case a message chain contained unusually high or low rated messages, the author was taken into special focus and his or her message chains were further analyzed. This was done because the scope of this study is to find rules that contribute to high or low rankings. Thus using messages that contain unusually high or low rankings yields clearer results. However, due to the large amount of the messages classified, the results still represent a very good average of all messages. A similar method was also used on messages written in distinctive style.

To further clarify author based message selection necessity: in Wowhead forum, the majority of messages consists of professor-style writing (87.7% in study material even after author based selection). In order to be able to analyze the difference between professor and student-style effect on rating, a sufficiently large sample of both styles had to be obtained. If the messages would have been selected completely randomly, it is unlikely that there would have been enough student-style messages for statistically significant results. Therefore, when a message written in student-style was encountered,

the authors other messages were also taken into study material under assumption that the person who writes badly does so consistently.

All in all, the author based selection method was used on approximately 10% of study material, which translates to 100 messages out of all 1000. This ensures still high level of randomness in data, but also that the sample is large enough for all the variables.

5.3 Material Restrictions

When a message chain was analyzed, some restrictions were imposed to guarantee the quality and generality of the data. The following is a list of reasons some messages were abandoned:

- Short message chains (below 10 messages)
- Unintelligible messages (for example, messages containing single letter)
- Edited messages (when editing clearly altered the rating)
- Unusually formatted messages (for example drawings of genealogy)
- Questions (without any other content)
- Small feedback sample (less than 11 votes)
- Duplicate messages (cross posting)

5.4 Dependent Variables

Dependent variable values are those that this study attempts to explain. For example, what are the attributes causing a message to receive a high ranking or large number of voters etc. and why do some messages receive very low ranking?

Plus and minus vote variables are not used anywhere else in the study. They are necessary in this chapter to analyze the difference between the number of plus and minus votes each message receives. Percentages for and against are used elsewhere instead to better illustrate the difference.

The following table summarizes the sample statistics in absolute values before the re-scaling was done.

Variable	Min	Max	Average
Rating	-16	655	29.82
Plus votes	1	742	36.93
Minus votes	0	87	7.11
For percentage	0.07	1.00	0.81
Against percentage	0.00	0.93	0.19
Voters	10	829	44.04

Table 11. Statistics of dependent variables

Forum users can vote each message plus or minus depending whether or not they like it or feel that it is useful for themselves or somebody else. The rating of the message is simply a mathematical sum of plus and minus ratings given, as explained earlier.

The number of plus and minus votes per average message indicate a clear difference. The average of given plus votes is 26.9 compared to the average of minus votes, which is 7.1. This indicates that for every given minus vote, 5.2 plus votes were given (ratio = 26.9 / 7.1 = 5.2). The difference in ratio means that in practice, users give plus ratings easier than minus ratings. Despite the anonymity provided by the forum, positive feedback is dominating over negative.

The majority of users voting for a message rather than against it is also visible in the graph showing the rating of messages compared to the number of voters. If the users would vote according to null-hypothesis (meaning 50% would vote for and 50% against the message) the line would be straight:

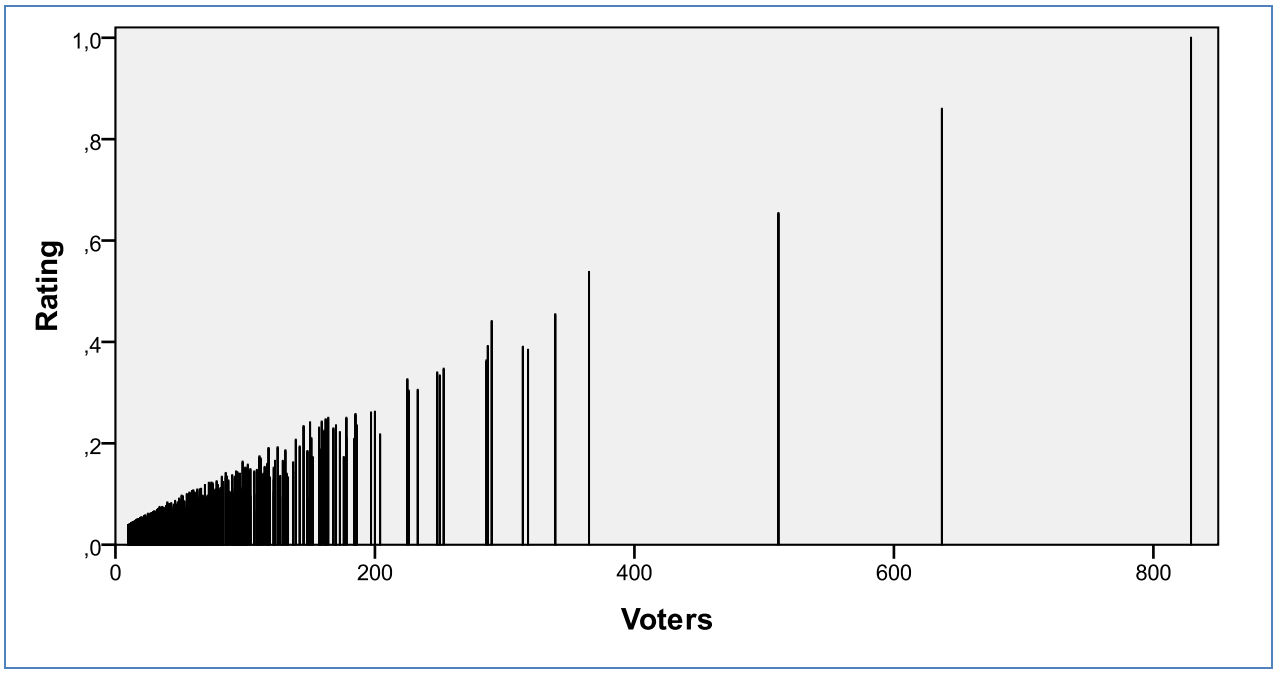

Figure 3. Voters of messages per rating. All messages

The relation between the number of voters and rating a message receives is almost perfectly linear. The more voters the better rating. The result can be simply explained by users preferring to give plus votes to messages they like over giving minus votes to disliked ones.

A study published in “Journal of Interactive Online Learning” found that positive comments were given online in 55% of cases and negative in 44% (Donovan, Mader, Shinsky 2006), which indicates that people preferring positive feedback over negative is not limited to Wowhead forum, even though the ratio seems to be even higher there.

The percentage of for and against variables measures the percentage of users who liked or disliked the message. In average 80.7% of the users likes and 19.3% dislikes messages. However, due to the mechanism that eventually removes the messages that get low ratings, these indicators are not completely accurate. Unfortunately, there is no information available about how many messages have been purged from the forums due to low rating.

In average, 44 users voted for or against a message. The maximum number of voters for one message was 829. The message in question was also the highest ranked message in the sample.

5.5 Independent Variables

Independent variables are used to explain the differences in dependent variables by looking for correlations. All the independent variables in this study were transformed into a range of 0-1 either by re-scaling the values or by originally assigning values in the range. In this sense, the values for most of the variables are in dichotomous format, one meaning contains and zero meaning does not contain. For example, when a message is assigned value one in tendentious humor variable, it means that the message contains tendentious humor, and zero signifies that no tendentious humor was found.

The following table shows all the independent variables in the study before the re-scaling was done. The length of the message is preserved in absolute scale to better illustrate the data:

Type	Variable	Min	Max	Average	N
General	Length of message	1	734	50.9	1000
Information	Extra Information	0	1	0.18	178
	Information (any type)	0	1	0.67	668
	Misinformation	0	1	0.05	53
	Knowledge	0	1	0.71	714
	Analysis	0	1	0.28	277
	Evaluation	0	1	0.01	99
Style	Professional	0	1	0.88	877
	Student	0	1	0.12	123
Humor	Humor (any type)	0	1	0.37	366
	Innocent	0	1	0.15	153
	Tendentious	0	1	0.22	219

Table 12. Statistics of the independent variables

5.5.1 General Variables

As seen in the table, the average length of messages is 50.9 words. To put this into perspective, the first verse of the Finnish national anthem is 22 words long using the same

criteria as in study material. Therefore, the average message length of the study material is roughly equal to two verses of the national anthem. This correlates with the average electronic message length derived by other studies. For example, in his study of physicians and their patients email exchange, Dean Sittig found that the average email message length was 39 words in response to messages (2003).

5.5.2 Information Variables

Inside the category of information variables, a new computed variable named “information” was created to allow further analysis. The variable has value one in case the message contains any kind of pragmatic information. In practice, this means that the value is zero in case a message contains misinformation and one in case it contains any other kind of information.

This computed variable is necessary in order to analyze correlations between ranking and information content only in case a message contains information, thus ignoring messages containing, for example, only humor. The variable was formed using the following Excel formula:

"=IF(AND(MISINFO=0;OR(KNOWLEDGE=1;ANALYSIS=1;EVALUATION=1));1;0)"

The formula examines values in knowledge, analysis and evaluation variables, and if any of the three values equals one, sets value of information variable to one as well. However, if misinformation variable is one, the value is set to zero to eliminate the effect of clear misinformation in the results.

The material shows that in sample the most common type of information is knowledge, which is found in 71.4% of all messages. By definition, a message cannot contain analysis type of information without containing knowledge. Therefore, it can be calculated that less than half of the messages containing knowledge also contain analysis. In most cases, evaluation is not possible without analysis and these two types of information have about the same ratio as knowledge and analysis. The ratio between knowledge and analysis is:

$$\frac{Knowledge}{Analysis} = 2.57$$

The ratio between analysis and evaluation is:

$$\frac{Analysis}{Evaluation} = 2.80$$

If it is assumed that the messages contain different types of information in the same ratio as it is used inside each message, this indicates that the knowledge type of information is used every 2.57 times to stress a point thus forming analysis, which in its turn is used every 2.80 times to form an opinion indicating use of evaluation.

Similarly, the number of facts stated before forming an opinion would be nearly ten. Mathematically, an opinion is formed after as many facts are stated as the ratio in the following formula indicates:

$$\frac{Knowledge}{Analysis} * \frac{Evaluation}{Analysis} = \frac{714}{277} * \frac{99}{277} = 0.919$$

Due to limitations in the study material, it must be noted that this is very much an approximation. Because a single message was the smallest investigated unit, the facts contained inside a message were not separated and only the contents of full messages can be taken into account.

During the classification, it was also noticed that when there is a message containing misinformation, the message correcting the error (normally the next message in chain) gets very high rating. For example, the following message contains misinformation about the way enchanting works. It received rating minus three with eleven users voting, which is in average an extremely bad result, most likely due to misinformation:

“Interestingly it doesn't mention melee AP specifically, that could mean it could proc for Hunters as well.

We have long been envious of all the proc based enchants as they are not only more effective mostly, but they are more fun to play with too, than a flat stat value. Here's hoping it will work off ranged attacks and affect RAP."

It is also interesting that the message containing misinformation received only 6.8% of the votes of the message correcting misinformation. According to a visual survey, this was quite a usual result for misinformation – correction message pair. The next message corrected the error and received a rating of 135 with 161 users voting, which is very high considering that the average number of voters in the sample was 44. The correction message was simple, concise and corrected the misinformation in impartial way.

"It doesn't. Weapon enchants affect the weapon being enchanted, not some other item in your inventory."

According to this observation, it seems that the users of Wowhead forums are not as willing to vote messages containing misinformation down, as they are to vote messages containing corrections up. Therefore, in practice this suggests that users wish to see somebody else corrected more than actually correct them personally.

Furthermore, misinformation in forums such as Wowhead can actually cause great trouble for the users, which might also explain why the reaction towards it is so strong. If users follow for example, coordinates leading them to the wrong place, the trouble of actually following the directions and finding out the hard way that the message contained misinformation is significant. Therefore, users might be tempted to vote plus for correction to misinformation more than normal messages – correction affects their game play in such large extend by saving them time to find out if the information was correct or incorrect themselves.

It was also systematically noted that messages containing direct insults, quite expectedly, receive very low ratings. For example in the following message, the user directs his or her remarks to one particular user who posted an earlier message:

“Xaria... I honestly hope noone reads/listens to your posts here at all. The dps difference from KD up to this weapon alone... just that dps difference... is worth an incredible amount of threat compared to losing the hit. The dps difference is worth giving up stamina rather than gaining it... its worth losing armor rather than gaining it.”

The information in the message above is valid but the rating, probably due to the insult the message contains, is only minus eleven with just two people voting for plus and thirteen voting for minus. It appears that even perfectly good information cannot overcome the negative feelings caused by an insult.

5.5.3 Style Variables

In the study material, well-written messages formed clear majority. This can be seen by comparing professor-style numbers to student-style. The ratio is 6.6, which means that for every student-style message there were almost seven professor-style messages. This indicates that the users of Wowhead are well educated and thus capable of giving impartial, logical votes. Unfortunately, there is no information available about the sociological background of the users of Wowhead.

This statistic is also affected by the messages being purged when ranking reaches certain lower threshold. In practice, it might cause the majority of badly formatted and written messages to disappear from the forums eventually. However, because the material in the study was fairly new, the ratio should reflect reality well.

A simple comparison of messages between Wowhead and a competing forum called Thottbot clearly indicates that the messages in the former are of higher quality. The difference was examined by selecting random message threads in both forums, and classifying messages based on their styles. The results can be found in the following table:

Forum	Messages	Professor	Student	Professor %
Wowhead	10	8	2	80%
Thottbot	13	8	5	62.5%

Table 13. Message style comparison between Wowhead and Thottbot

Most likely, the difference reflects real qualities of the users in Wowhead forums. The majority of the Internet sources also acknowledge this. For example, in discussion found in another forum, the large majority of people prefer Wowhead for its simplicity and better information (www.wow.com 2010).

5.5.4 Humor Variables

In humor variables, a computed variable named “humor” was added. This variable defines if the message contained any of the two types of humor classified, innocent or tendentious. In practice, this variable measures if there is any kind of humor in the message. Humor variable was added to allow analyzing data and finding correlations between message rating and any type of humor or lack of it. The variable was formed using the following Excel formula:

"=IF(OR(INNOCENT=1;TENDENTIOUS=1);1;0)"

The Wowhead forum messages contain humor roughly in one third of messages (36.6%). Similar kind of penetration percents have been found in advertisement. For example, Weinberger et al (1995) found that up to 30% of American television ads are intended to be humorous. The usage of humor in ads and forums is most likely similar, attracting users to concentrate on the message and obtain good feedback.

In Wowhead forum, the dominating type of humor is tendentious humor, which is not surprising taking the high quality of messages into account, indicating intelligent user base. Studies have found correlation between wit and sarcastic humor (Smith, White 1965). Since tendentious humor is in large part sarcasm and irony, the result is to be expected.

Another interesting observation is that apparently in Wowhead forums, humor and information are almost mutually exclusive. Information can be found in 71.7% of messages, and humor in 36.6%, which means that even though one or another is present in almost all the messages, only 13.9% of messages contain both types.

The difference between tendentious humor and innocent humor (21.9% and 15.3% respectively) found in the messages might also be partly explained by the difficulties of

classification. In many cases, it was very difficult to define if the author meant his or her comment as tendentious or innocent. However, the ratio between innocent and tendentious humor in online forum messages was found to be 1.3% and 2.8%, respectively, in a study conducted by Alberto Beuchot and Mask Bullen (2005). Even though the percentage is very different, the ratio is almost identical. The difference in volume is easily explained by the different realm of the forums.

In many cases, it was noticed during the classification that messages containing humor tended to form comment chains. For example, in the discussion about NPC Deathbringer Saurfang, somebody mentioned his similarities to Chuck Norris, a widely known icon for strength in the Internet. The original message about the similarities was very simple:

“High Overlord Saurfang is Chuck Norris' Main Character”

After the first message, literally dozens of messages followed, each one containing some type of humor, along the lines of these examples:

“Wrong, Chuck Norris is Saurfang's alt, Saurfang is Saurfang's main”

“Children wear Superman pyjamas. Superman wears Chuck Norris pyjamas. Chuck Norris wears Saurfang pyjamas.”

“Saurfang can divide by zero.”

The same tendency of a similar kind of messages forming comment chains was also noticed in other types of messages. For example, messages containing information were often followed by long chains of messages refining or adding new information. Similarly, messages containing game lore were followed by more lore messages. This indicates that the discussion is very homogenous but unfortunately, it cannot be further investigated using quantitative methods within this study, because the material only takes individual message statistics into account.

The similarity of messages in threads is self-evident in most discussion forums, as every message is in a sense continuance to the originating message. However, in Wowhead the thread form is much more flexible. The discussion revolves normally around a certain item or quest, but the limits of the ways the discussion can evolve are virtually infinite. In this respect, the observation of large message chains in similar formats suggests that the users are very aware of the other messages belonging to same chain.

6 Methods

6.1 General

The raw data was inserted in Microsoft Excel 2007 spreadsheet program for further calculations. Copy and paste method was used to insert the messages into Excel from Firefox browser. The data was then used to calculate the minimum and maximum values of each variables as well as averages, and some basic analyzing was done based on these values. Excel was also used to calculate absolute message length automatically, as well as re-scaled values for ranking, length and other static variables. After this, the data was further analyzed in SPSS Statistics 17.0 software, using correlation and regression analysis.

The study was conducted to find out what attributes of messages causes them to receive high ratings from the users. Therefore, the study method selected was mostly, but not exclusively, quantitative. The goal of the study was to find out if there are any positive or negative correlations between the dependent and independent variables.

The possibility of type I and II errors in the sample was minimized by using p-value of 0.05 (5% probability that the observed correlations were random) as the limit for statistical significance, which was also calculated using SPSS Statistics software.

6.2 Correlation Analysis

Bivariate correlation analysis was done to find out what are the individual correlations between all the measured variables and message rating. This information was used to rank the variables according to their importance, both using strength of correlation and the effect of variable on average rating. Because the correlation between message rating and other measured parameters is not necessary linear, both Pearson and Spearman's Rho correlation tests were used. There was no theoretical basis to expect either only positive or negative correlations, so 2-tailed test method were selected for the analysis.

6.3 Regression Analysis

Multiple regression analysis was done to find out which variables cause correlation together. SPSS Statistics software was used to analyze all variables and generalized variables separately. Generalized variables in this context means, that humor variables were combined as well as information variables.

6.4 Study Questions

This study attempts to address questions concerning the rating of messages in Wowhead forum. The questions can be divided into two groups: questions concerning the rating received and questions concerning general characteristics of Wowhead forum. The first and most important goal is to answer the following questions:

- Which attributes of a message contribute to rating it receives
- Which attributes do not contribute at all
- Which attributes cause rating to increase
- Which attributes cause rating to decrease
- Which attributes are important and which are unimportant
- How to compose a message in order to receive good feedback
- What is the specific role of information in rating received

During the study some additional questions, based on the selected material, can also be answered. These questions are also important when trying to define what kind of user base Wowhead forum has, without having access to any statistics about it. User base has an impact on interpreting and analyzing the results. The general questions that will be answered are the following:

- What is the quality of messages in Wowhead forum
- What kind of users Wowhead forum has
- What is the major purpose of Wowhead forum for the users

The methods of answering these questions are outlined in this chapter. The results will be presented after this chapter in a format of clear text answers, tables and graphs. In the discussion and results chapter the findings will be discussed in more detail.

7 Results

7.1 General

The results of the study are collected in this chapter and broken down according to different types of variables studies. Each variable is given either Pearson or Spearman's rho correlation in table and the findings are further presented using text and graphs.

7.2 General Variables

7.2.1 Length

Coefficient	Dep.	Variable	Correlation	Significance	N
Spearman’s rho	Rating	Length	-0.111	0.000	1000

Table 14. Correlation of rating and message length

Significant non-linear correlation between rating and length was found. The correlation is negative which means that the shorter the message is, the higher rating is receives. The following graph shows the relation in absolute values:

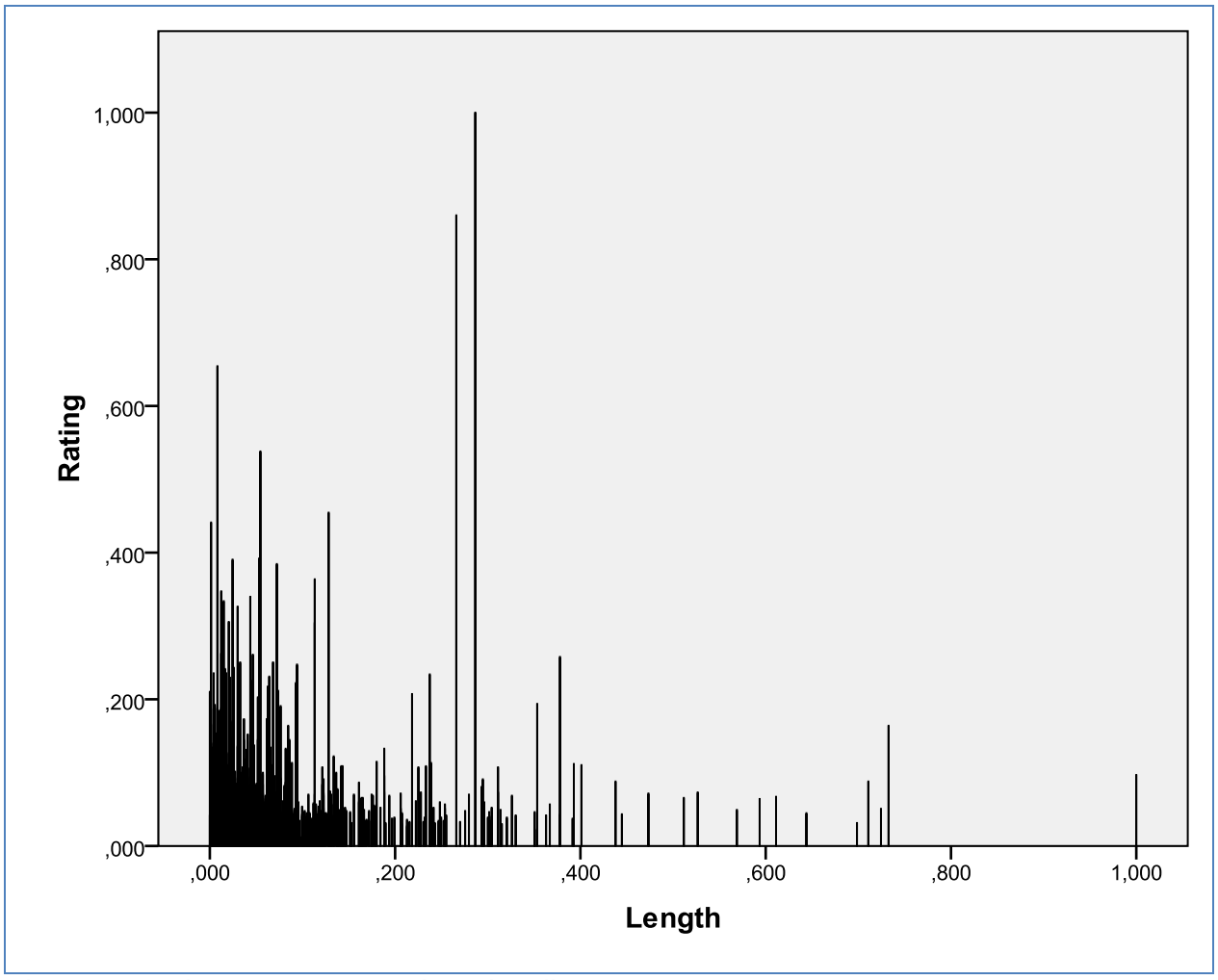

Figure 4. Rating per message length. All messages

As the length of message increases, the rating it receives decreases. The correlation is not linear, however, and therefore is not detected in Pearson's correlation test. This is caused by the two high rated outliers at around 280 words. The frequency analysis reveals that a great majority of the sample messages are fairly short, the mean value being 0.07, which translates to an actual length of 52 words.

The message length has clear effect in the rating received. Generally, the longer a message is the smaller rating it receives. In a study conducted in 1999, the influence of message length in communication accuracy was studied. It was found that it is more efficient to send two messages, both containing two commands than one message containing four commands (Morrow, Prinzo 1999). Similarly, it appears that the users of Wowhead discussion forum prefer rather short messages than long ones. In practice, this

means that in order to receive good feedback, long messages should be split into smaller entities.

The following graph shows the division of message length. Altogether, 71.6% of messages are shorter than the average re-scaled length of the messages (0.681 corresponding to 50.91 words), as illustrated in the following graph. The division is not Gaussian as might be expected:

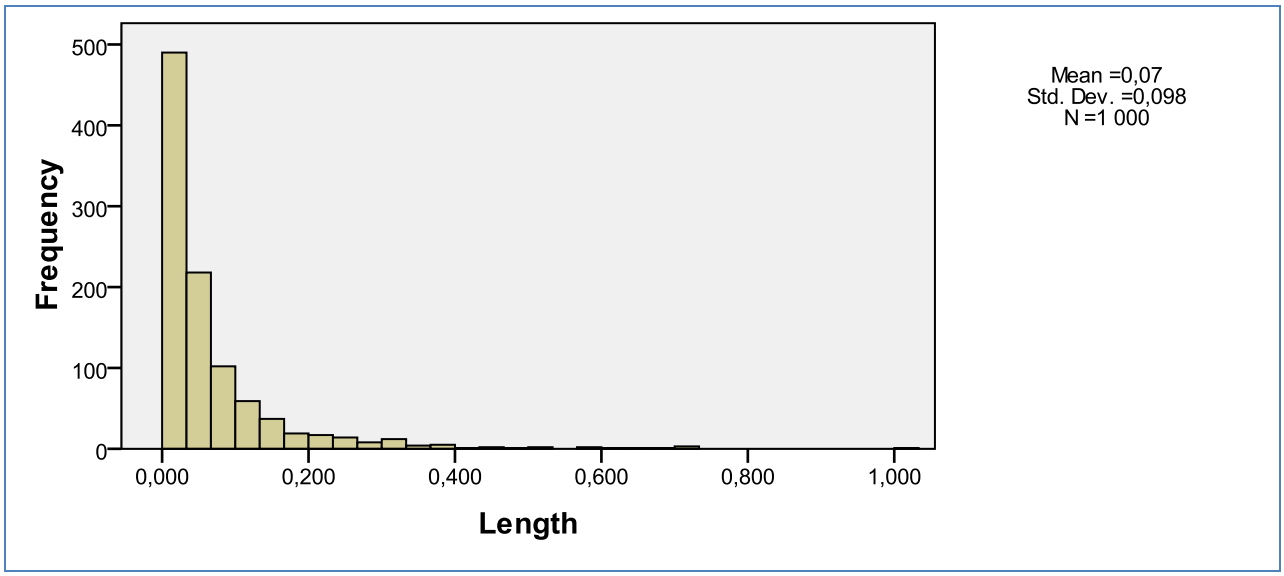

Figure 5. Frequency per message length. All messages

When study material was limited to only include messages with information content, the correlation between rating and length turned positive and became more apparent. Relation also became linear (Pearson correlation 0.104 with p-value 0.007).

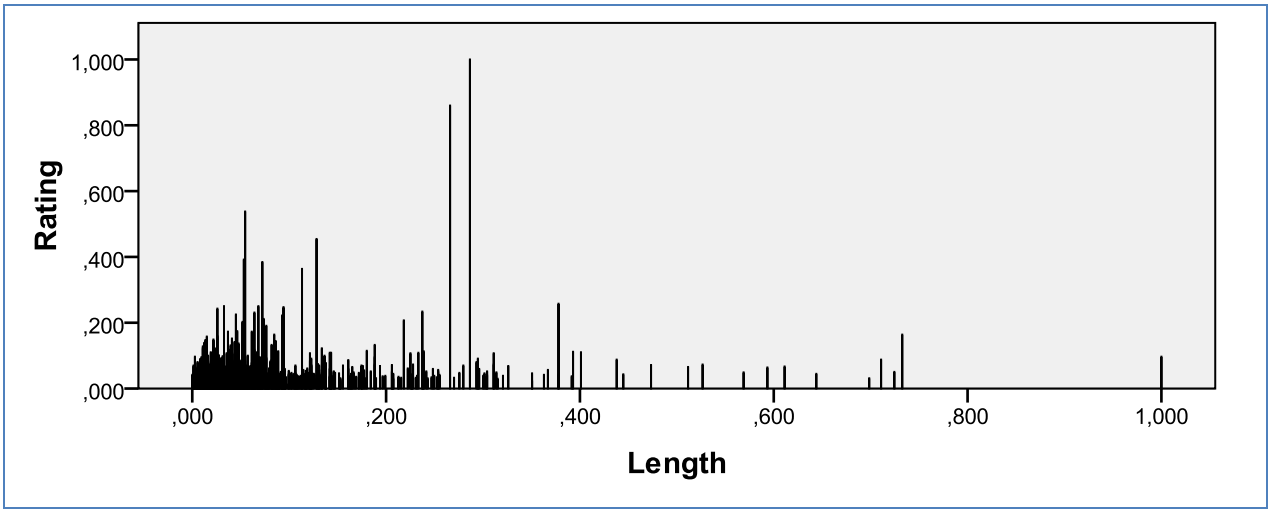

Figure 6. Rating per message length. Messages with information only

The result is important as it suggests that shorter message lengths secure better rating for a general type of message, but when information is transmitted, longer length is more beneficial. The difference is probably explained by the nature of information. The longer a message is, the more information it can carry, which is clearly desirable for the users seeking answers. These users probably also have better motivation to read through long messages than users looking for entertainment.

As with all the attributes and tests, the correlation between length and percentages of users voting for and against messages was also examined, but the results were not different in comparison with rating only.

7.3 Voters

The relation between the number of voters and the message length was analyzed to find out if there is significant correlation between these variables.

Coefficient	Dep.	Variable	Correlation	Significance	N
Spearman's rho	Voters	Length	-0.069	0.030	1000

Table 15. Correlation between voters and message length

A negative non-linear correlation was found (Spearman's rho -0.069 p-value 0.030) when all the messages were analyzed. Shorter messages receive more votes than long ones.

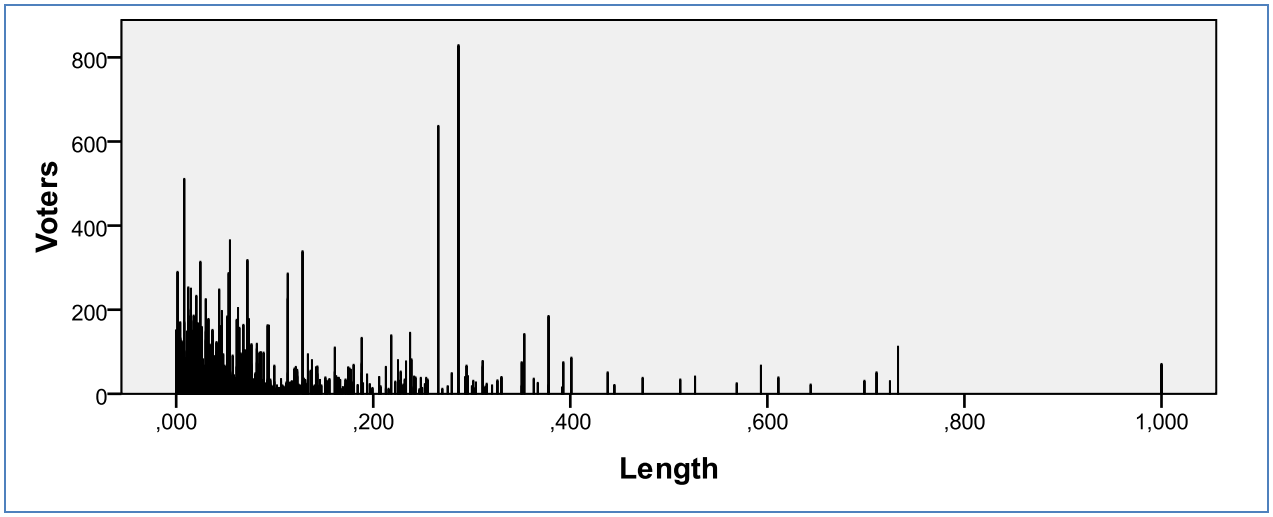

Figure 7. Number of voters per message length. All messages

The shorter the message is, the more voters it attracts, which probably also means that more people read shorter messages as opposed to longer ones. It is logical to draw a conclusion that messages reach receivers more efficiently when the length is kept short. According to the frequency, most voters prefer short messages to long ones.

A similar kind of analysis was done only to messages containing information. This analysis was done to find out if the users behave the same way while seeking information. It was found that the behavior is different. When a message contains information, the correlation is positive (Pearson correlation 0.117 p-value 0.002). Longer messages attract more votes than short ones when they contain information.

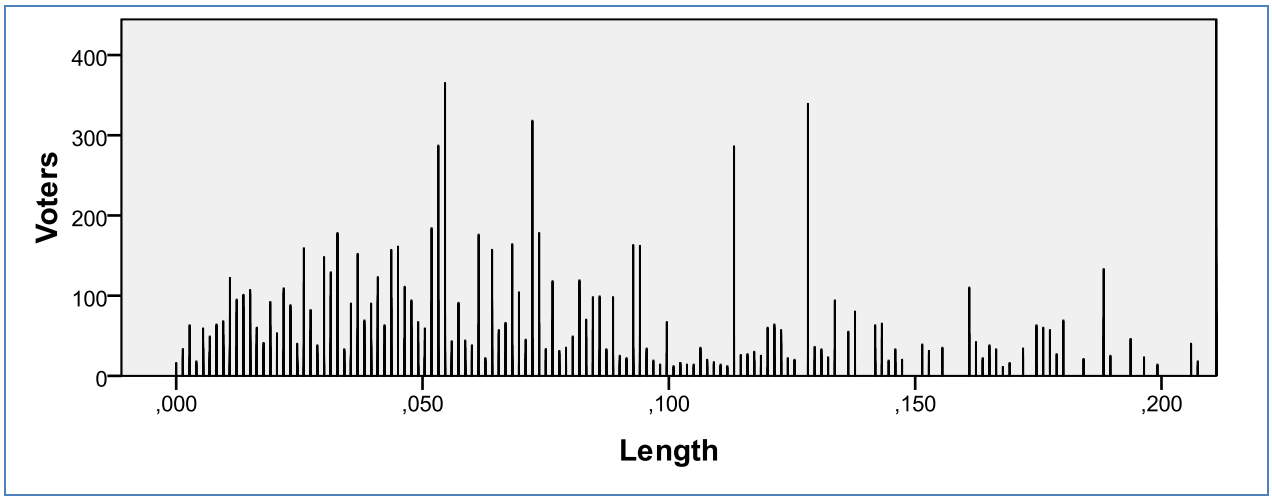

Figure 8. Voters per message length. Messages containing information of length <= 0.200

Examining the graph also suggests that for short messages the correlation is positive and turns negative when message length reaches around 0.050 (corresponding to 38 words). However, the difference is not statistically significant.

7.4 Information Variables

Information variables were examined to find out if information content contributed to the rating messages receive. The variables measured when classifying the messages were extra information, knowledge, analysis and evaluation. The order signifies the more complex forms of information and therefore, longer messages.

7.4.1 Extra Information

Coefficient	Dep.	Variable	Correlation	Significance	N
Pearson	Rating	Extra Information	0.065	0.041	1000

Table 16. Correlation of rating and extra information

Statistically significant linear correlation was found between the rating and messages containing extra information. The extra information as defined in this study, is kind of compressed information that has great potential for benefiting the user.

For example, coordinates might point a user to the right geographical locations much in the same manner as people use GPS, without having to endure complicated directions. A macro might enable user to easily perform a complicated task, just with the push of a button. Keeping in mind that the shorter messages receive higher ratings, it is highly likely that users especially appreciate information in compact format, as proven by the positive correlation between extra information and rating.

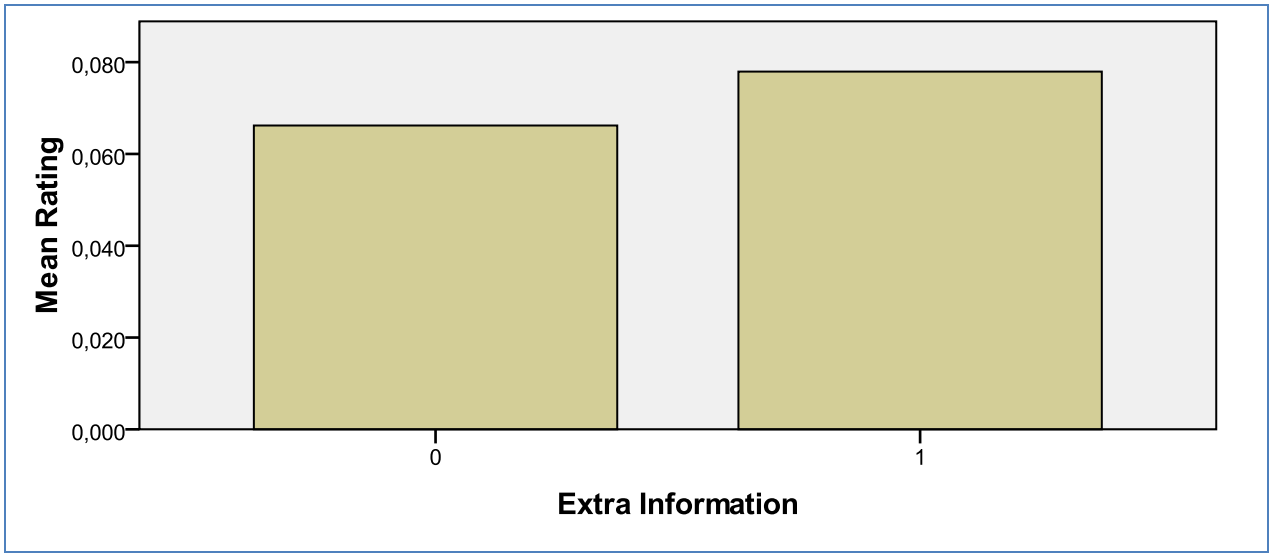

Figure 9. Mean rating per extra information

An interesting observation was made when examining the effect of extra information in messages containing more than 50 words. The positive correlation increased (Pearson 0.192 p-value 0.001) significantly.

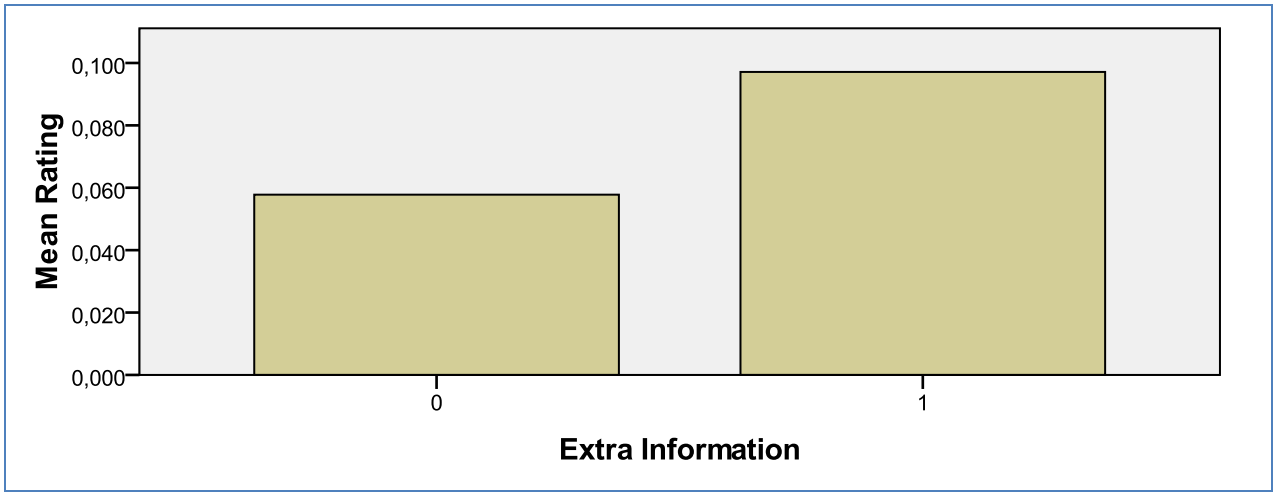

Figure 10. Mean rating per extra information. Messages => 50 words length

It appears that users prefer extra information even more when it is presented in longer message. This is surprising, because the nature of extra information is that it is very compact (links, equations, coordinates). This is especially important, because later in this study it is shown that longer messages containing other types of information receive less than average ratings, even in the group of longer messages.

The result suggests that usage of extra information in a message can cause the rating to rise above average. In this sense, extra information can be seen as an “eye-catcher”, attracting more users to give positive feedback. General information (knowledge, analysis, evaluation) was not seen to have a similar kind of effect, so it seems to be unique to extra type of information.

Because every message that contains extra information also contains other types of information, this is a very important observation. It is possible to improve the feedback a message receives simply by adding extra information in it, even if the same information is already stated in longer format.

An example of adding value to a message and therefore increasing the rating it receives can be found for example, in the use of coordinates. Judged by the information content below, the following two messages are identical, both giving instructions on how to find the mobs mentioned:

"I can't stress this enough. On the little piece of land North of the naga there is a ton of Moonstalker Sires and Matriarchs. It's a nice, easy place to farm them as they're pretty well spaced out and there is no other aggressive creatures in the area."

"I can't stress this enough. On the little piece of land North of the naga there is a ton of Moonstalker Sires and Matriarchs. Coords are 10,69. It's a nice, easy place to farm them as they're pretty well spaced out and there is no other aggressive creatures in the area."

The usage of extra information (in the form of coordinates) in the latter message would, according to the results of this study, cause it to receive a higher rating than the previous

one. The usage of extra information saves users from deciphering often complicated instructions, thus making the information given in messages more valuable.

Extra information in messages shorter than 50 words, cause correlations to turn slightly negative, but the result is not statistically significant (Pearson -0.030 p-value 0.424). Overall, extra information does not seem to have any effect in short messages when all the data is analyzed. The situation did not change even when only messages containing information were examined.

7.4.2 Information

The information variable was computed using the material. It defines if messages contain either knowledge, analysis or evaluation types of information. The result is that information variable combines all the other types of information into one and enables the study of overall information effects to rating.

Coefficient	Dep.	Variable	Correlation	Significance	N
Pearson	Rating	Information	-0.136	0.000	1000

Table 17. Correlation of rating and information

Strong negative linear correlation was found between information in messages and the rating it receives.

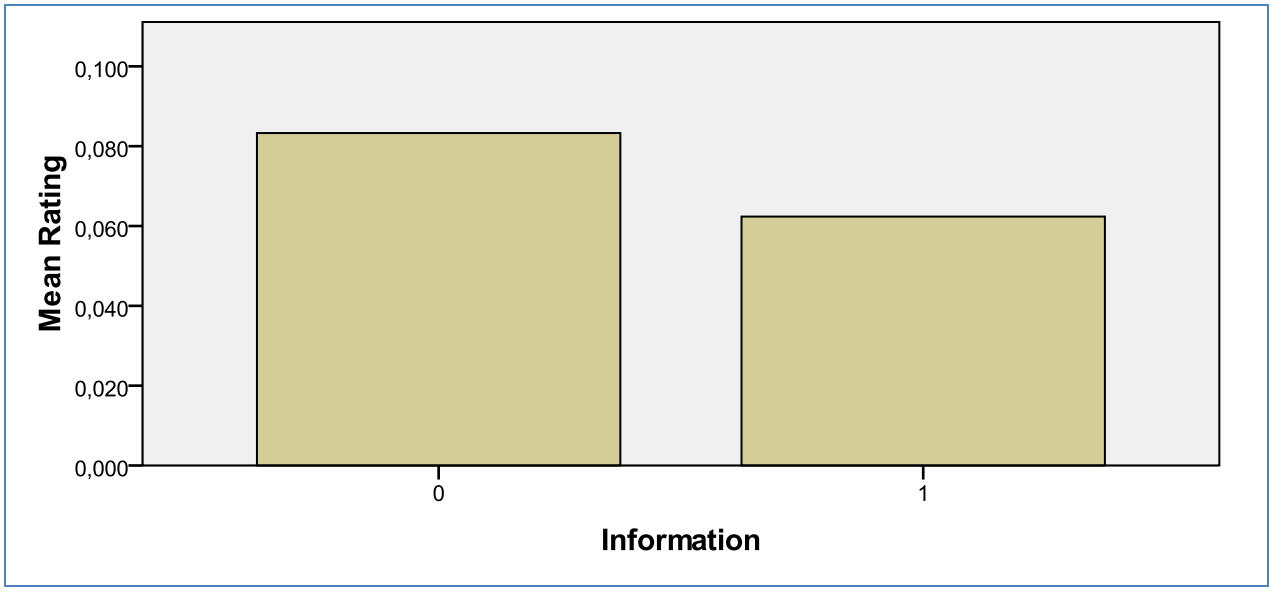

Figure 11. Mean rating per information content

It was somewhat unexpected to find such a clear correlation. Before the material was analyzed, it was expected that the presence of information in messages would attract higher rating, but the actual correlation proved to be the opposite. The result is complicated to explain. One possible explanation might be that the average length of messages containing information was longer than the average of all messages, thus causing less users to read them. In addition, messages containing information typically did not contain humor, which proved to be the most important attribute in highly rated messages.

As demonstrated earlier in this study, users of Wowhead forums generally prefer short messages. This might cause messages containing information to receive lower ratings simply because they tend to be long and the majority of users do not have the patience to concentrate and read them.

On the other hand, some of the highest rated messages were those that contained information. Because of that, a further analysis was conducted using the length of the message as breakpoint. It turned out when messages longer than 50 words were examined, the negative correlation greatly decreased (Pearson -0.007 p-value 0.911).

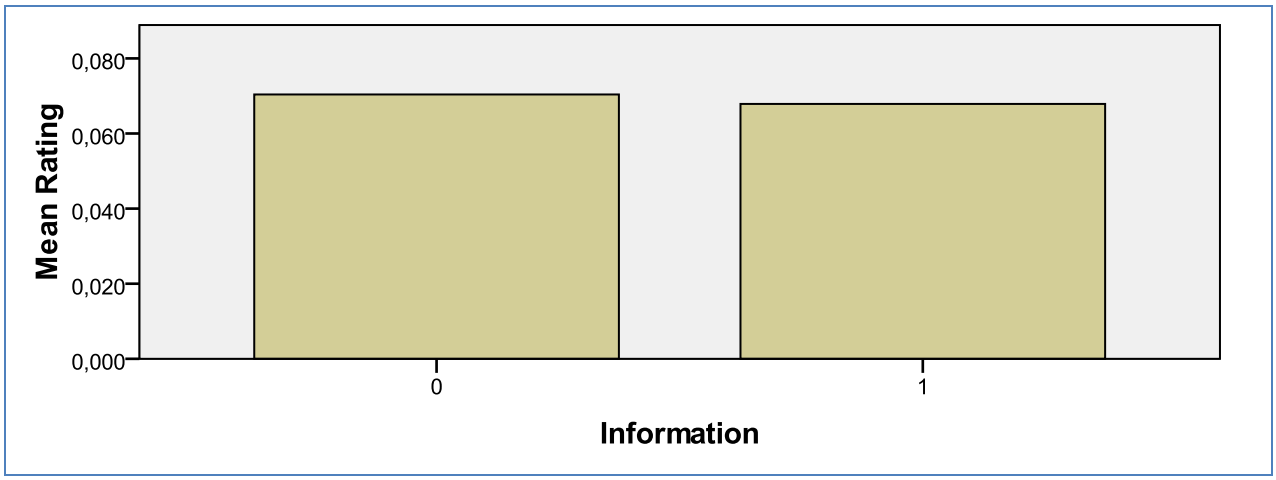

Figure 12. Mean rating per information content. Messages > 50 words length

When the same analysis was done to messages that were shorter than 50 words, the negative correlation between rating and information content became even more apparent than in the original analysis of all the messages (Pearson -0.207 p-value 0.000).

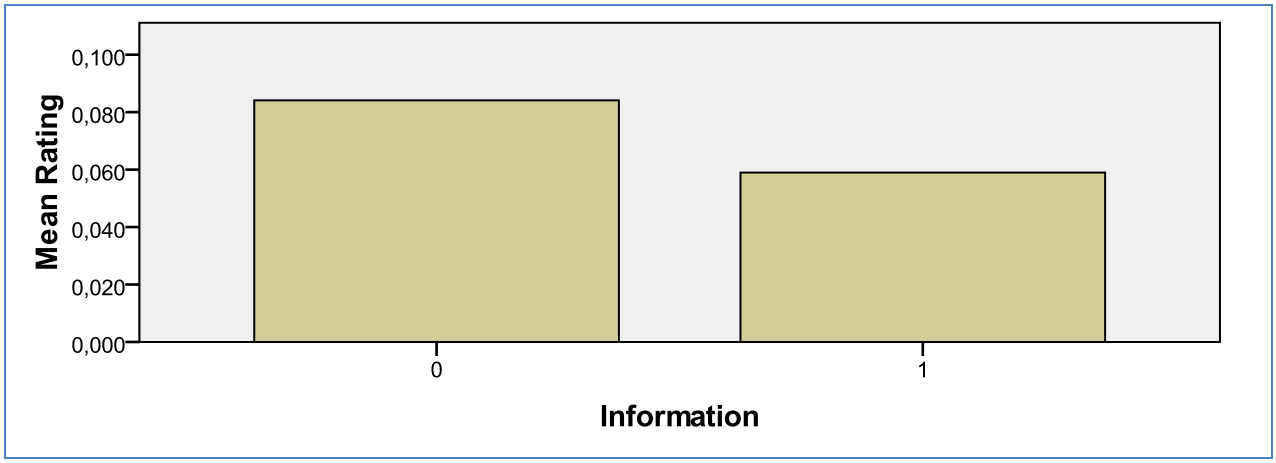

Figure 13. Mean rating per information content. Messages < 50 words length

The result can be interpreted in many ways. One possibility is that in short messages, the users prefer humor and in long messages, the information content becomes more important. Longer messages also carry more potential to present complex information and therefore might be more appealing and useful to the users seeking answers.

7.4.3 Knowledge

The knowledge variable was added in the study to measure how simple facts affect the rating of messages. It must be noted that in the scope of this study, the value or

correctness of information was not measured in any way, as it would have been simply too much work. Knowledge as defined in this study is knowledge in its purest form, free of interpretations. Knowledge was simply treated as a method of transmitting information, or rather eliminating other possibilities.

Coefficient	Dep.	Variable	Correlation	Significance	N
Pearson	Rating	Knowledge	-0.133	0.000	1000

Table 18. Correlation of rating and knowledge

Negative linear correlation was found between knowledge and rating. The correlation is fairly weak, which is also visualized in the graph below:

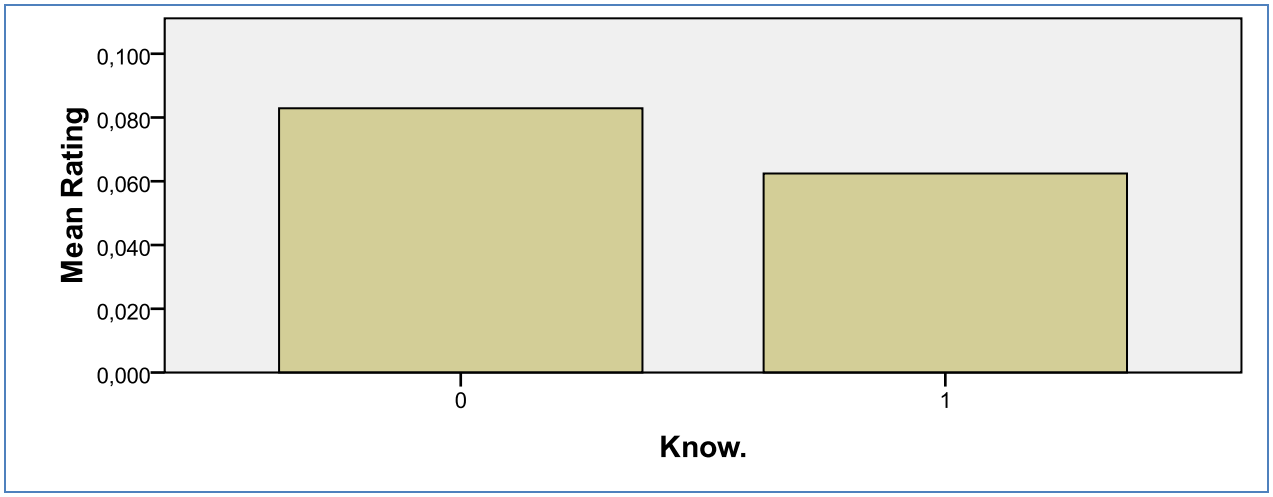

Figure 14. Mean rating per knowledge

The fact that the users of Wowhead forums prefer messages without knowledge is unexpected. This is probably because the messages containing humor are so popular, and very few messages containing any types of information contain humor also. Only 139 messages out of 1000 analyzed contained both humor and information. This corresponds to 13.9% of messages.

It seems that users prefer humor especially in short messages. To prove this, messages shorter than 10 words were examined. In this group, there are altogether 202 messages, out of which 40.6% contain any type of information and 56.9% humor. Both humor and information can be found in 9.9% of messages. The average rating of messages containing information is 0.054, both humor and information 0.062 and humor only 0.090.

The result shows that users give higher ratings to messages if they contain humor. The lowest score is received by messages containing information. Messages containing both, rate in the middle.

Analyzing messages longer than 10 words changes the situation dramatically. Altogether, 829 messages fulfill the criteria, out of which 78.0% contain any type of information and 32.4% humor. Both humor and information can be found in 14.5% of messages. The average rating of messages containing information is 0.063, humor 0.088 and both humor and information 0.088.

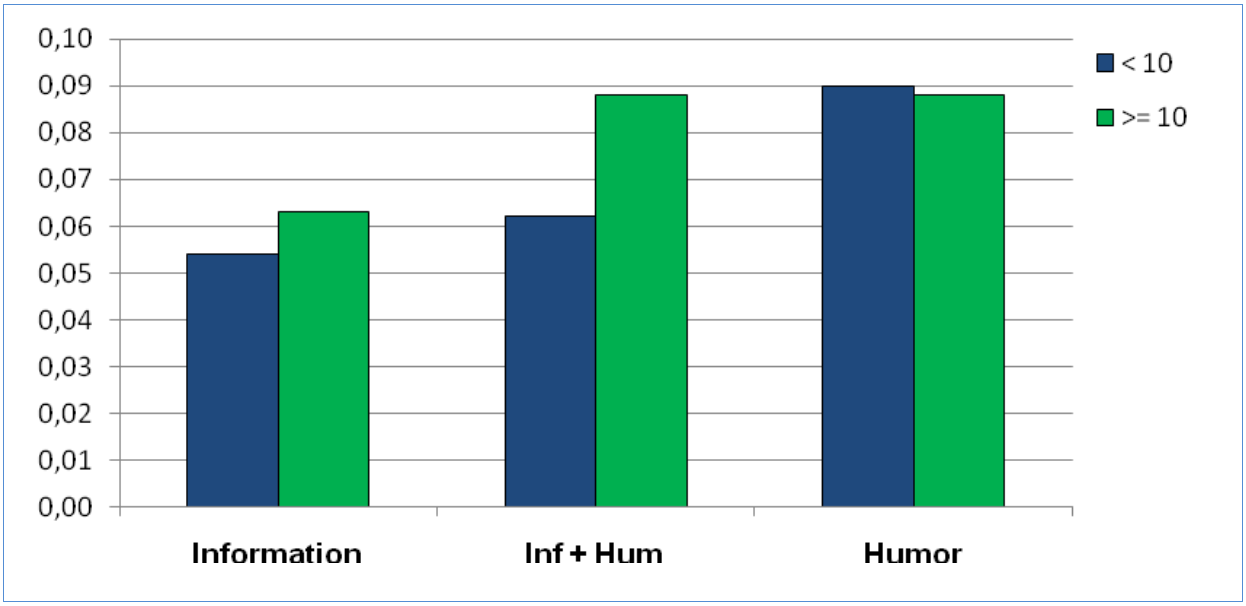

Figure 15. Average rating of messages containing humor, information and both

In longer messages, the order of average scores is still the same, but the differences are much smaller. The average rating of messages containing information is higher and the rating of messages containing humor is lower. Most significantly, the messages containing both types have equal rating with humor.

In general, it seems that in short messages the users prefer humor only and reward such messages with high ratings. However, in long messages the importance of information increases and the most efficient way to transmit information is to increase the message length and combine it with humor.

7.4.4 Analysis

Analysis variable was added to the study to find out if higher levels of information have any effect on the rating received. In a way, analysis is taking knowledge further, using logical reasoning on facts. Messages containing analysis type of information are a subset of messages containing knowledge, due to the relationship between the two types.

Coefficient	Dep.	Variable	Correlation	Significance	N
Pearson	Rating	Analysis	-0.003	0.921	1000

Table 19. Correlation of rating and analysis

No significant correlation was found between messages containing analysis type of information and the rating message received. There is very weak negative non-linear correlation, but it is not statistically significant. Possible correlation was also examined using Kendall's tau_b test, but to no effect. The test was done again using the average message size of 51 as breakpoint, but no correlation was found. Limiting messages to those that contain information revealed nothing either.

The fact that there is no significant negative or positive correlation seems to suggest that the users are impartial to analysis type of information. In other words, it does not affect the votes users give in anyway.

The possible reasons why higher levels of information do not have any effect on rating can be found in the way the Wowhead forum is used. The users state that they prefer Wowhead to other forums because it is well organized and information is easy to find (www.wow.com 2010). This can be interpreted as users wanting a very precise kind of information.

Earlier, it was proved that extra type of information correlates positively with the rating, which further proves that the users of Wowhead forum are after clear facts and therefore not interested in analyzing and evaluating the information. Apparently, they want the exact facts, nothing more, and are impartial to any information that goes beyond that.

7.4.5 Evaluation

Evaluation variable measure the highest form of information in this study, which is forming opinions based on facts and analysis. It was added to find out if the users react to opinions in the messages.

Coefficient	Dep.	Variable	Correlation	Significance	N
Pearson	Rating	Evaluation	-0.022	0.403	1000

Table 20. Correlation of rating and evaluation

No significant correlation was found between evaluation type of information and the rating messages received. A similar type of further tests as with the analysis type of information were conducted, but no correlation was found using any method.

The possible explanations why using evaluation in messages has no effects in the rating it receives, are on the same lines as with analysis. Apparently, opinions in messages do not affect the rating either.

7.4.6 Misinformation

Variable defining if there is misinformation was added to variables to find out how the users react if messages contain invalid information. The misinformation in this study was defined as semantic and / or pragmatic information, which is not usable because it is incorrect.

Coefficient	Dep.	Variable	Correlation	Significance	N
Pearson	Rating	Misinformation	-0.492	0.000	1000

Table 21. Correlation of rating and misinformation

As might be expected, very strong negative linear correlation was found between misinformation and rating.

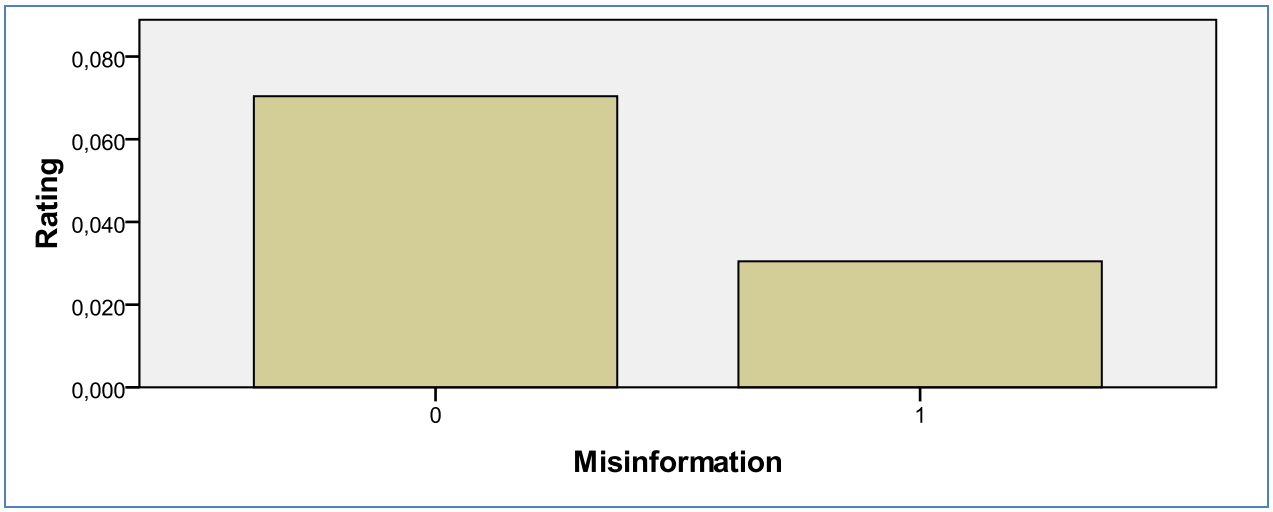

Figure 16. Rating per misinformation

The difference is clearly visible in the average rating 0.07 of all the messages compared to rating 0.03 of messages containing misinformation. The difference is also obvious when comparing the average to rating 0.07 of all the messages containing information.

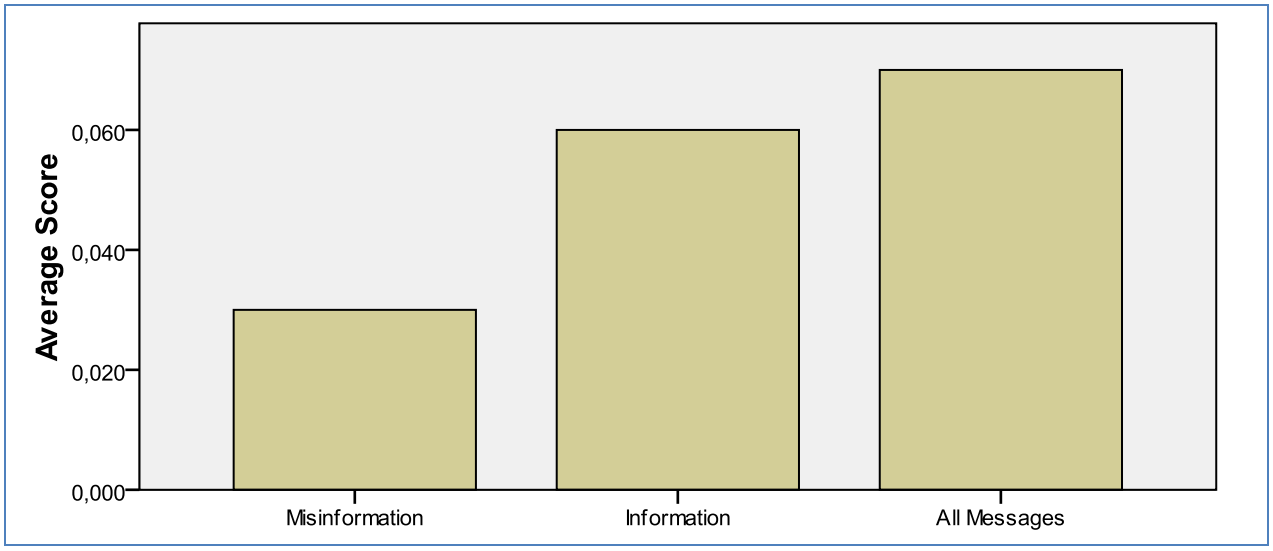

Figure 17. Rating per messages containing misinformation, information and all messages

According to the result, people dislike misinformation strongly. The concept of misinformation is in the very heart of the rating system in Wowhead forums. The original purpose of rating was to flag the messages containing false information to warn users and promote the ones that are most useful.

While classification of the messages were carried out, it was noted that even perfectly formatted and presented message are rated down efficiently, if it contains misinformation. For example, consider the following message:

“Let's add another correction to the already long line. The Night Elves weren't split at the First War. They used magic in the same sense Humans do now, only more recklessly. Meaning some were not users, others were and yet others distrusted the magic users and vice versa. The High Elves at that time were a political entity. The people that wanted certain people to rule the rest because they were just 'better', in this case because of magic. Good old Azshara was the main proponent of this. Her most staunch followers became the Naga in time."

The message contains a lot of knowledge and lore, which is generally well received by the users. It is well formatted and written in good and clear English. However, some of the facts are not correct. The result is that this message receives only rating of two with 14 users voting for and 12 against it. According to this observation, it is of utmost importance to make sure all the facts are correct. If not, otherwise perfectly good information can lose all of its importance.

Strong negative correlation between professor-style writing and misinformation was found (Pearson -0.135 p-value 0.000). Similarly, there is positive correlation between student-style writing and misinformation (Pearson 0.102 p-value 0.001). It appears that badly formatted messages contain misinformation more often than well formatted. Another possibility is that the users of forum deem badly formatted messages as misinformation more easily.

The negative correlation between misinformation and rating messages receive is the strongest negative relationship found in this study. This suggests that users react to misinformation with the largest scale, thus making avoiding giving misinformation the highest priority to everybody transmitting information. According to results, it is even better not to give any information than misinformation, in terms of feedback. The average rating of all the messages containing no information is 0.83 and of messages containing misinformation 0.03.

7.5 Style Variables

In order to find out how the style messages were written in affects the rating it receives, two style variables were added. Professor-style messages are written in fluent, immaculate English and student-style messages in a poorer manner.

7.5.1 Professor

Coefficient	Dep.	Variable	Correlation	Significance	N
Pearson	Rating	Professor	0.106	0.001	1000

Table 22. Correlation of rating and professor-style

Significant linear correlation was found between usage of professor-style writing and rating.

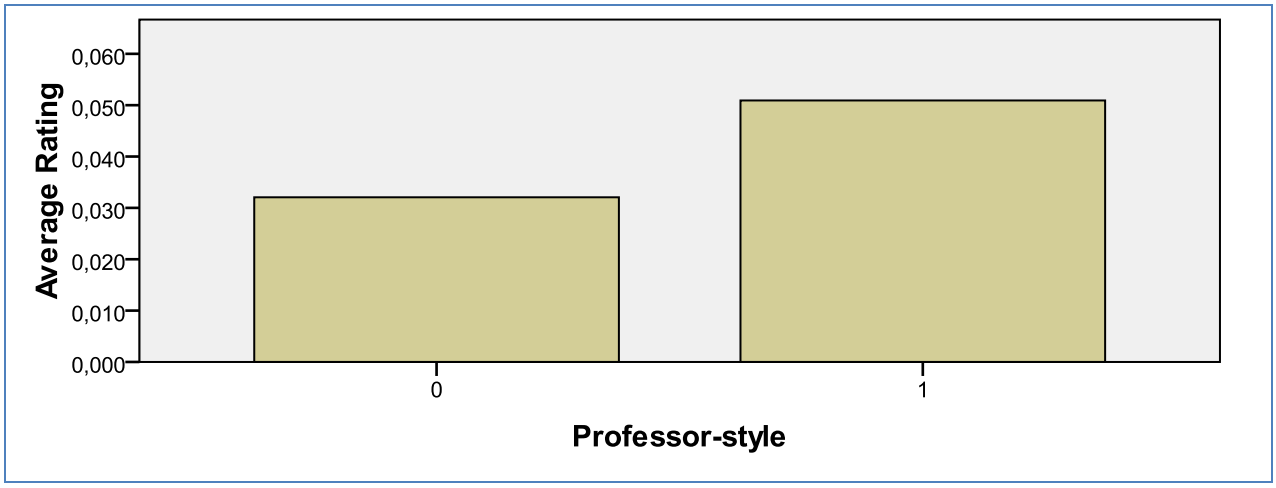

Figure 18. Rating per professor-style. All messages

The correlation proves that the users prefer well-formatted messages to bad ones. The result is expected as reading fluently written messages is pleasant.

Flesh-Kincaid readability test uses total words, total sentences, total syllables and total words of passage to measure the readability (Kincaid, Fishburne, Rogers, Chissom 1975). In the test, as words per sentence and syllables per sentence increase, the passage becomes less legible. Readability was one of the major factors when classifying messages

into professor and student –styles. The effect of well readable messages is clearly visible in the strong correlation between professor-style messages and rating.

It would be interesting to see how Flesh-Kincaid readability test score correlates with the ratings messages receive, but it is outside scope of this study. However, it is highly likely that professor / student classification measures very much the same style issues as Flesh-Kincaid test. Therefore, classification used in this study would be partly redundant with other readability tests.

The popularity of well-written messages is also evident in the linear positive correlation in a number of votes messages receive (Pearson 0.083 p-value 0.009). Messages written using the professor-style receive considerably more votes than student-style messages. The average votes of professor-style messages are 45.76 compared to the average count of student-style messages 31.73. The average of all messages is 44.

Even stronger correlation exists between professor-style messages containing information and rating (Pearson 0.111 p-value 0.003). This suggests that it is even more important to pay attention to readability when transmitting information than in general. For messages not containing information, the correlation is smaller (Pearson 0.103 p-value 0.085). In terms of average rating, the difference is 0.065 for messages written in professor-style and containing information and 0.043 for messages written in student-style.

7.5.2 Student

There is no need to examine the effect of student-variable, as it is a complement variable to the professor. Thus all the results of professor-variable apply in reverse.

7.6 Humor

Humor was separated into two categories: innocent and tendentious, to find out if different kinds correlate with rating. However, no significant difference exists between different types of humor. The existence of any type of humor is a much bigger factor in the rating received than the type of humor, even though the usage of innocent humor receives slightly higher ratings.

7.6.1 Innocent

Coefficient	Dep.	Variable	Correlation	Significance	N
Pearson	Rating	Innocent humor	0.144	0.000	1000

Table 23. Correlation of rating and innocent humor

Significant linear and correlation exists between innocent humor and message rating.

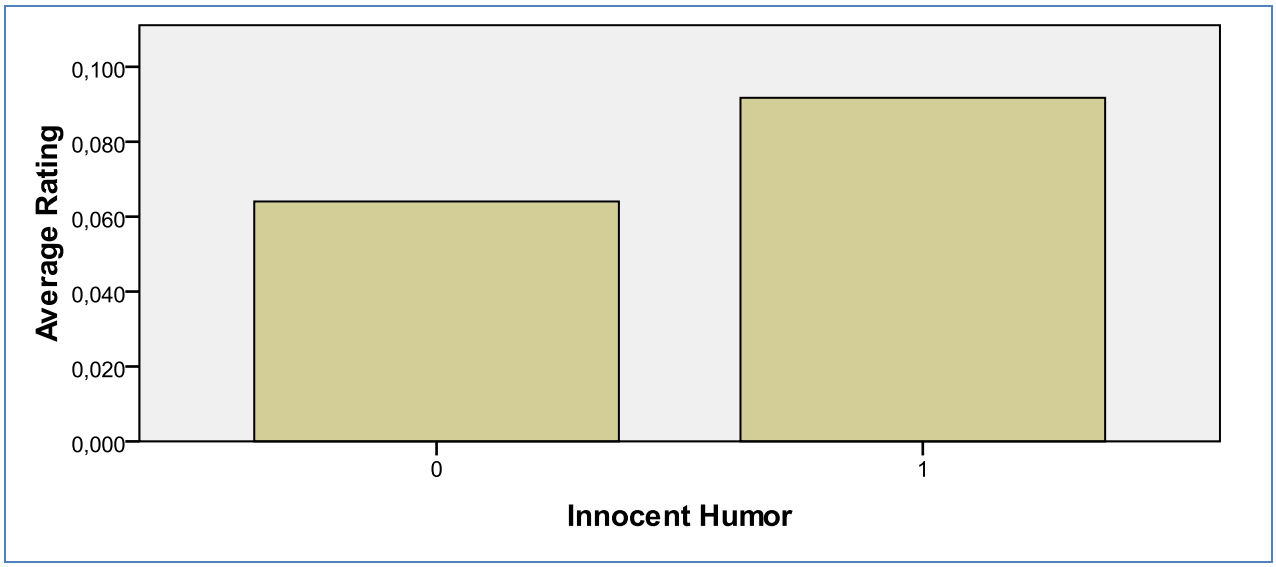

Figure 19. Average rating per innocent humor. All messages

The average rating increases if a message contains innocent humor. The result is expected, as humor is a generally much appreciated and used method of communication in Internet communities. Innocent humor cannot offend anybody and is very likely to receive good ratings.

Negative correlation was found between message length and humor, meaning shorter messages are more likely to contain humor (Pearson -0.173 p-value 0.000). On the other hand, there is positive correlation between message length and information content (Pearson 0.277 p-value 0.000), which is further proof of mutually exclusive nature of information and humor in Wowhead forums.

7.6.2 Tendentious

Coefficient	Dep.	Variable	Correlation	Significance	N
Pearson	Rating	Tend. humor	0.131	0.000	1000

Table 24. Correlation of rating and tendentious humor

Significant linear correlation between tendentious humor and rating of message exists.

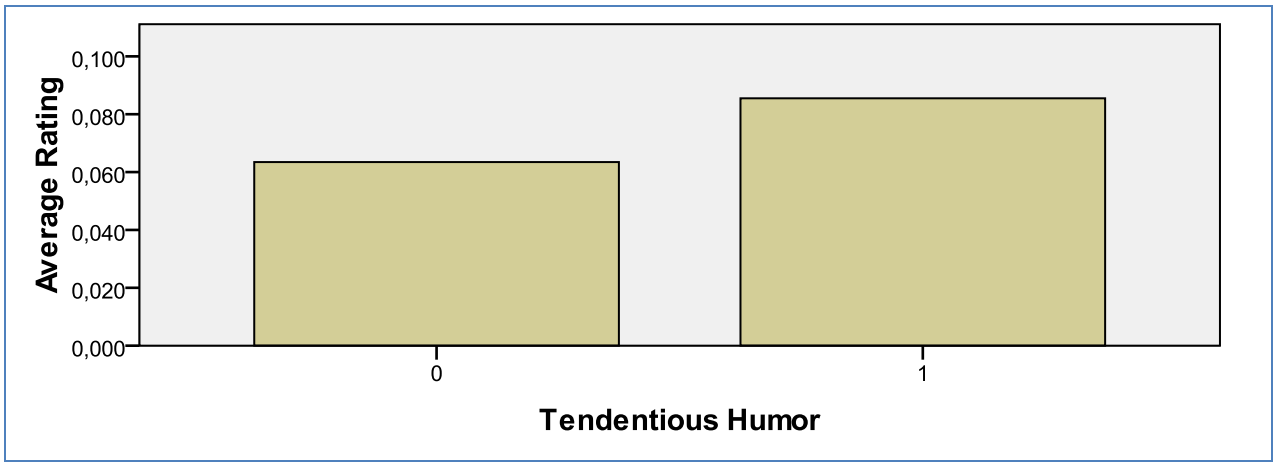

Figure 20. Average rating per tendentious humor. All messages

Altogether, there are 153 messages containing innocent humor and 219 containing tendentious humor. As pointed out earlier, this is the expected result considering the high quality of messages indicating an intelligent user base, combined with the sarcasm being the humor choice of the witty. However, messages containing innocent humor received a slightly higher average rating (0.092) than those containing tendentious humor (0.086).

This suggests that even though tendentious humor is more common in messages, people prefer innocent humor when rating. Perhaps innocent humor is more pleasant to read but tendentious humor more appealing when writing messages.

The difference between the rating given to innocent and tendentious humor is also clearly visible in vote division. Innocent humor gets more plus votes (0.071 in average) than tendentious humor (0.066). When examining the minus votes, the situation naturally changes the other way, even though only slightly (0.0957 for innocent and 0.0961 for tendentious). The result is consistent with the fact that the users seem to prefer innocent

humor and therefore vote against tendentious more than average, which is 0.0954 for all the messages containing humor.

Even thought there is a measurable difference between the rating of messages containing innocent humor and tendentious humor, it is very small. It seems that the usage of humor in general is a much larger factor (average score 0.088) compared to the average score of all messages (0.068) resulting in the average difference of 0.020.

The average difference between rating of messages containing innocent humor and the average of all the messages containing humor is 0.004. The same value for tendentious humor is -0.002. The difference between the importance of having any kind of humor in messages, is roughly 10 times the difference between innocent and tendentious humor.

Figure 21. Effect of different humor types compared to all messages

7.7 Regression Analysis

7.7.1 General

Multiple regression analysis was performed on the data to find out which of the independent variables are together related to dependent variable. The analysis was done in two parts: first by adding all the variables in the model and then by adding generalized variables (information, humor etc). The division was done because the correlation analysis earlier already indicated that, for example, the general existence of information or humor in

messages has more of an impact on rating than individual variables. SPSS Statistics were used to include only the variables with high impact to final model.

Multiple regression analysis is typically used when there is no experiment involved in the study, and the data is collected at the same point in time. Therefore, causal inferences cannot be made and the correlation analysis becomes the best approach (Field 2008). As the material of this study was natural and collected at the same time, all the characteristics of usable correlation analysis were fulfilled.

In the analysis, the confidence interval was set to 95% level, and the use of probability F for entry and removal levels were set to 0.05 and 0.10, respectively. A stepwise method for variable entry was used to ensure that every variable is tested against entry criteria.

7.7.2 All Variables

In individual variables regression analysis, the most accurate model was found to use innocent humor, tendentious humor, professional-style, misinformation and extra information variables. This model explains approximately 7.3% of the variations in rating. Durbin-Watson test result for the final model was 1.6, which is only 0.4 away from optimal value of 2.0. The result means that the model is valid and can be used to explain variations of rating with significant accuracy. The variables left outside the model were length, knowledge, analysis, evaluation and student-style.

Model (Dependent Variable Rating)	R	R Sq.	Adj. R Sq.	Std. Error
Inno	0.144	0.021	0.020	0.069
Inno+Tend	0.216	0.046	0.045	0.069
Inno+Tend+Prof	0.242	0.059	0.056	0.067
Inno+Tend+Prof+Mis	0.261	0.068	0.065	0.067
Inno+Tend+Prof+Mis+Extra	0.271	0.073	0.069	0.067

Table 25. Model summary of Multiple Regression Analysis. All Variables

When individual variables impact in model was examined using coefficient, the order of importance can be found. As seen in the table below, in the final model (last in table) all the variables are statistically significant ($p < 0.05$). The variable having most impact is positively correlated innocent humor, followed closely by tendentious humor. Third is

negatively correlated misinformation. Fourth is, only by a small margin, positively correlated professor-style writing and fifth extra information.

Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.064	0.002		270.140	0.000
	Innocent-humor	0.028	0.006	0.144	40.587	0.000
2	(Constant)	0.057	0.003		210.317	0.000
	Innocent-humor	0.033	0.006	0.174	50.527	0.000
	Tendentious-humor	0.027	0.005	0.164	50.199	0.000
3	(Constant)	0.037	0.006		50.788	0.000
	Innocent-humor	0.034	0.006	0.177	50.657	0.000
	Tendentious-humor	0.028	0.005	0.164	50.250	0.000
	Professor-style	0.023	0.006	0.111	30.598	0.000
4	(Constant)	0.041	0.006		60.330	0.000
	Innocent-humor	0.033	0.006	0.170	50.450	0.000
	Tendentious-humor	0.026	0.005	0.156	40.989	0.000
	Professor-style	0.021	0.006	0.100	30.262	0.001
	Misinformation	-0.031	0.010	-0.099	-30.203	0.001
5	(Constant)	0.039	0.006		60.045	0.000
	Innocent-humor	0.033	0.006	0.174	50.571	0.000
	Tendentious-humor	0.027	0.005	0.161	50.155	0.000
	Professor-style	0.020	0.007	0.095	30.093	0.002
	Misinformation	-0.030	0.010	-0.096	-30.114	0.002
	Extra Information	0.013	0.006	0.070	20.283	0.023

Table 26. Variable Coefficients. All Variables

7.7.3 General Variables

In general variables regression analysis, it was found that the most accurate model uses humor, student-style, misinformation, length and extra information variables. This model explains approximately 7.6% of the variations in rating, which means it is slightly more accurate than the model generated using all variables. Durbin-Watson's test result for the final model was 1.6. The only variable left outside the model was information, which correlates very little with other variables (t-value ranging from 0.032 to 1.251 in the attempted models).

Model (Dependent Variable Rating)	R	R Sq.	Adj. R Sq.	Std. Error
Hum	0.212	0.045	0.044	0.068
Hum+Stu	0.239	0.057	0.055	0.067
Hum+Stu+Mis	0.258	0.067	0.064	0.067
Hum+Stu+Mis+Len	0.268	0.072	0.068	0.067
Hum+Stu+Mis+Len+Ext	0.275	0.076	0.071	0.067

Table 27. Model summary of Multiple Regressions Analysis. General Variables

As seen in the table below, in the final model (last in table) all the variables are statistically significant ($p < 0.05$). The variable having most impact is positively correlated humor. The second negatively correlated student-style writing, followed by positive length, negative misinformation and positive extra information.

Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	0.057	0.003		21.201	0.000
	Humor	0.031	0.004	0.212	6.859	0.000
2	(Constant)	0.060	0.003		21.483	0.000
	Humor	0.031	0.004	0.214	6.965	0.000
	Student	-0.023	0.006	-0.110	-3.571	0.000
3	(Constant)	0.062	0.003		21.781	0.000
	Humor	0.029	0.004	0.204	6.646	0.000
	Student	-0.021	0.006	-0.100	-3.235	0.001
	Misinformation	-0.031	0.010	-0.099	-3.207	0.001
4	(Constant)	0.057	0.003		17.118	0.000
	Humor	0.031	0.004	0.217	6.971	0.000
	Student	-0.021	0.006	-0.097	-3.173	0.002
	Misinformation	-0.031	0.010	-0.099	-3.200	0.001
	Length	0.052	0.022	0.074	2.372	0.018
5	(Constant)	0.056	0.003		15.960	0.000
	Humor	0.032	0.004	0.221	70.084	0.000
	Student	-0.020	0.006	-0.093	-30.033	0.002
	Misinformation	-0.030	0.010	-0.096	-3.123	0.002
	Length	0.046	0.022	0.064	20.053	0.040
	Extra Information	0.011	0.006	0.061	1.971	0.049

Table 28. Variable Coefficients. General Variables

8 Discussion and Conclusions

8.1 General

The rating a message receives is a combination of several important factors, which were identified during the study. Both positive and negative factors were found. In order to write a message that receives high rating it is important to make sure there is no incorrect information, to include some humor, write in fluent style, avoid long messages and bad language.

The most unexpected finding was that there is no benefit in including correct information in the message. In fact, inclusion of information causes a message rating to decrease. This was especially surprising when the purpose of Wowhead forums is taken into account. The forum is used as a means of sharing and searching for information. However, based on the results it seems that, it is in fact used more for amusement purposes, or at least generic kinds of messages are more appreciated.

In this chapter, innocent and tendentious humor is treated as one variable because there is no significant difference between them. Humor itself correlates more with rating than either distinctive type.

An examination of the average length of messages containing different types of semantic information, reveals that the more complicated information is the longer message is. On average, the messages containing knowledge type of information were around 63.51 words long. The same value for messages containing analysis was 93.31 and evaluation type 118.27. The length for all the types of information containing messages was considerably longer than the average length 50.91 of all the messages.

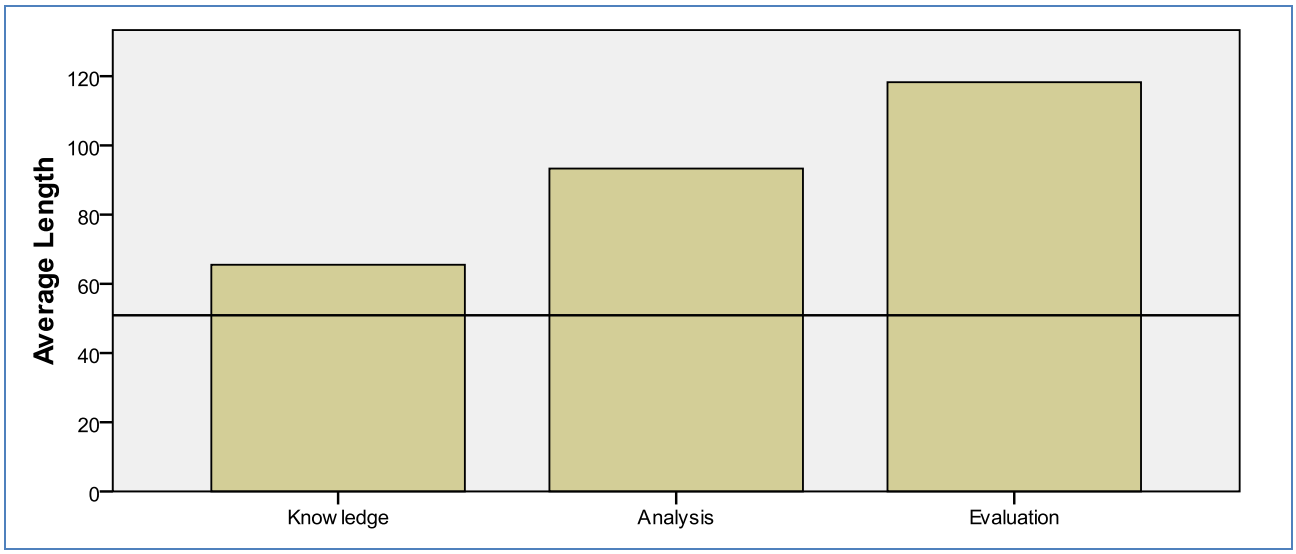

Figure 22. Average length of messages containing semantic information. Reference line marks the average of all messages

The result is inevitable due to the cumulative nature of knowledge -> analysis -> evaluation chain. In order to perform analysis, knowledge (e.g. facts) must be presented. Therefore messages transmitting analysis type of information must use more words than those transmitting knowledge. The same principle works between analysis and evaluation, thus resulting in longer messages as the information transmitted becomes more complicated. The relation of average length between the information types is perfectly linear, with the ratio between types being 1.27.

The result suggests that transmitting information in Wowhead forum requires more complicated messages than what is needed in general discussion. Of course, it is also self-evident that longer messages have more space for different types of information. Which is more important a factor that is unknown and cannot be studied using this material.

Different types of information are also combined into “Information” variable, which signifies that there is any type of information present in message. It was done because the correlation between rating and information in general is stronger than any individual type of information, except extra information that was kept separate.

The correlation given in tables is Pearson correlation except in non-linear case of message length, which shows Spearman’s rho correlation.

To highlight the differences between important attributes between all messages and messages containing information, this chapter was split into two. The first chapter discusses the importance of attributes in all messages and the second in messages containing only information.

8.2 All Messages

8.2.1 Positive Variables

The following table presents the positive correlation found between the message variables and rating in importance order for all the messages. Statistically insignificant variables are omitted off the list. The sample was all 1000 messages.

Ranking	Attribute	Correlation
1.	Humor	0.212
2.	Professor-style	0.106
3.	Extra information	0.065

Table 29. Variables positively correlated to rating in importance order

8.2.2 Negative Variables

The following table presents the negative correlation found between the message attributes and rating in importance order for all the messages. Statistically insignificant variables are omitted off the list.

Ranking	Attribute	Correlation
1.	Information	-0.136
2.	Misinformation	-0.129
3.	Message length	-0.111
4.	Student-style	-0.106

Table 30. Variables negatively correlated to rating in importance order

8.2.3 Average Rating

When different variables are ranked based on an average message rating, the order is slightly different. This suggests that even though the users vote messages containing certain variables, such as the style of writing, more radically, they appreciate other attributes, such as extra information, more in average.

It is also notable that humor is the most important factor both in terms of average rating as well as correlation. Humor is clearly the single most important factor when users give positive votes.

Message length cannot be placed in the table as it is measured in interval scale whereas all the other variables are measured in categorical scale. Thus, it is impossible to convert message length to scale that is compatible with the rest of the data.

Ranking	Attribute	Average rating
1.	Humor	0.088
2.	Extra information	0.078
3.	Professor	0.071
4.	Information	0.067
5.	Student	0.049
6.	Misinformation	0.030

Table 31. Average rating of variables

The messages containing humor, extra information and professor-style writing are rated above average, and information in general, student-style writing and misinformation below. There is a direct relation between messages containing these variables and rating being above or below average.

8.3 Information Messages

Only the messages containing information were examined to find out if the results were different from all the messages. The sample consists of 717 messages containing one or several types of information.

8.3.1 Positive Variables

The following table presents the positive correlation found between the message attributes and rating of the importance order for messages containing information. Statistically insignificant variables are omitted off the list.

Ranking	Attribute	Correlation
1.	Humor	0.157
2.	Extra information	0.114
3.	Professor-style	0.111
4.	Message length	0.103

Table 32. Variables positively correlated to rating in importance order. Messages containing information only

Humor has the strongest correlation to rating also in messages containing information. However, the correlation of extra information increased significantly. This suggests that adding “compressed” information is even more important in messages transmitting information. This kind of information is very quick for users to evaluate and use, and therefore results in a higher rating.

The correlation of professor-style writing also increased, meaning fluent writing becomes more important when messages contain information. When jokes and general chat are the main purpose of message, the writing style is less important. Information transmittal requires more effort and is more prone to errors, but the problems can be tackled by using immaculate language, as the result shows.

The message length correlation changes radically, from non-linear negative to linear positive. Information value typically increases along with message length, and more information can be coded in messages. However, as shown, extra information is an exception to this rule as in this case very compact information can result in big benefits, due to compressed coding. In a way, extra information is a large amount of information very tightly packed, for example in coordinates form. Using it seems to have the same effect as writing longer messages and thus adding more information content.

8.3.2 Negative Variables

The following table presents the negative correlation found between the message attributes and rating in importance order for information messages. Statistically insignificant variables are omitted off the list. As the sample only contains messages with information content, the variable “information” is also omitted.

Ranking	Attribute	Correlation
1.	Misinformation	-0.133
2.	Student-style	-0.111

Table 33. Variables negatively correlated to rating in importance order. Messages containing information only

As expected, the effect of misinformation is even higher than in all the messages. This is to be expected as message containing false information loses its information value and becomes worthless to the user. Therefore, it is clear that they will give such messages even lower ratings when searching for information than in general.

Messages written in bad language are also rated lower than when sample is all messages. The same way as fluency in language helps comprehending information content, bad writing hinders it.

8.3.3 Average Rating

The average rating between different attributes does not change when only messages containing information are examined. However, the ratio between the average rating does change, which indicates there are differences nevertheless.

Message length cannot be placed in the table as it is measured in interval scale whereas all the other variables are measured in categorical scale. Thus, it is impossible to convert message length to scale that is compatible with the rest of the data.

Ranking	Attribute	Average rating
1.	Humor	0.084
2.	Extra information	0.077
3.	Professor	0.065
4.	Information	0.062
5.	Student	0.043
6.	Misinformation	0.030

Table 34. Average rating of variables. Messages containing information only

The chart below shows the differences between all messages and messages containing information in graphical format. Because the sample consists only of messages that contain information, the variable measuring information content is unchanged.

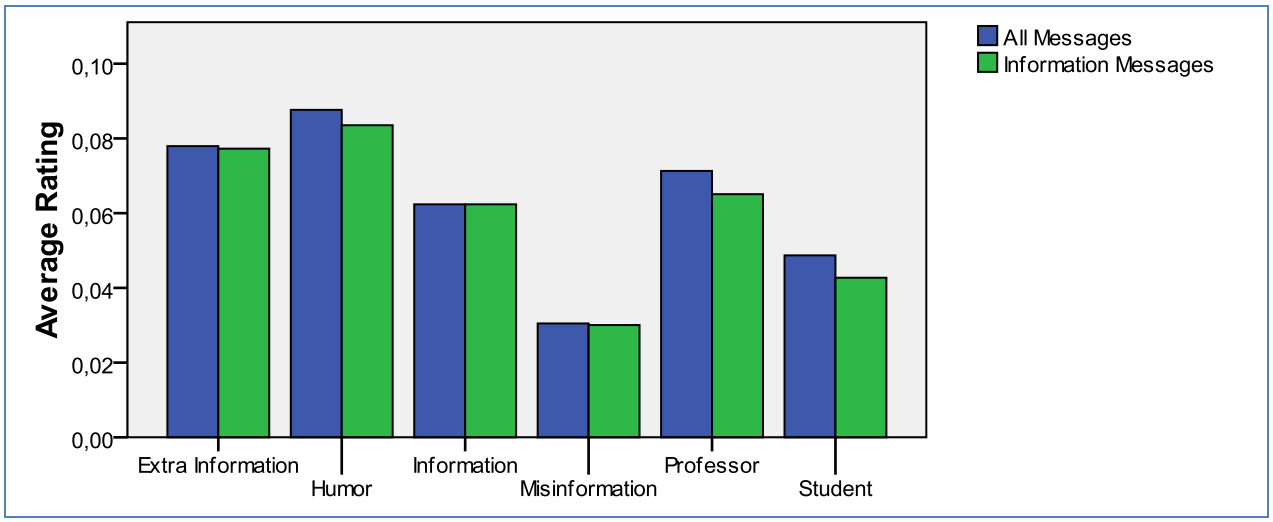

Figure 23. Average rating of attributes in messages containing information compared to all messages

The average rating of messages containing information is consistently lower than that of all messages, because information messages are generally below average rating. The significance of the chart is in the difference in bar heights. The smaller the difference is, the more important is the increase in variable.

The chart shows that there is large drop in the average rating of messages containing humor. This means that the role of humor in messages containing information is considerably smaller than in all messages. However, as information messages rarely

contain humor the sample is very small. Thus, not too much emphasis on this result should be given.

The decrease in professor and student writing styles is exactly an average decrease as one or another style is defined for each message. Extra information decreases only slightly, indicating that it is a very important attribute in messages containing information.

A relatively small difference in the rating of misinformation is caused by messages containing it already receiving extremely bad ratings in all the messages. Therefore, the drop cannot be more significant.

8.4 Regression Analysis

The regression analysis revealed that the variables have a stronger impact in rating together than alone. The strongest impact was found, expectedly, using generalized variables in group. This was already anticipated from correlation analysis results, which indicated clear advantage in grouping variables.

In the most accurate model comprising of humor, student-style, length, misinformation, and extra information (in this importance order), the impact of humor was overwhelming with t-value of 70.1. The rest of the variables are nowhere near as important in explaining the changes in rating.

Multiple regression analysis can also be used to create a formula that predicts the value of dependent variable. It is done using the independent variables found to have an impact on analysis. In this study material, the formula that, according to the study, predicts the rating value in 7.6% of cases with accuracy better than 95%, is the following:

$$Rat = 0.056 + Hum * 0.032 + Stud * -0.020 + Mis * -0.030 + Len * 0.045 + Ext * 0.011$$

Regression analysis proved to be a good tool to find out which of the variables are having the most impact on the rating. An optimal model was found and it can be used to predict

the result and explain interworking of the variables. Information was not included in the important variables in this analysis either.

8.5 Previous Studies

To compare the results of this study to previous ones is very difficult, due to the fact that there does not appear to be any similar studies even in different fields. Apparently, nobody has studied the impact of message attributes on the popularity. However, there are some studies with similar characteristics, which can be used to compare results.

In their study, Gilbert and Dabbagh found that giving proper guidelines were important in order to assist facilitation and evaluation of online discussion (2005). In Wowhead forum, the guidelines are given in form of "Read me first" posting, that every user is expected to examine. In this post, the proper usage of the forum is discussed and a list of rules are outlined. The users obedience of the rules is clearly visible in a high percentage of professor-style writing. According to Gilbert and Dabbagh, the fact that the guidelines are followed enables the forum to be used more effectively.

One of the results of this study was, that the forum messages tend to form long similarly formatted, and content-wise nearly identical threads. A similar effect was found in a study conducted by Hara, Bonk and Angeli, who noticed that the first message was very important for the evolution of message thread (1999). If the first message was of high quality, the thread became more interactive (meaning normally longer) and the quality of messages increased. Therefore the role of the first message was very important. Long threads of similar high quality messages found in this study suggest the same.

In a study conducted by Beuchot and Bullen, they found that 54% of messages in a forum they examined contained information but only 4.1% humor (2005). The information penetration is fairly similar to what was found in this study (71.4%), but the humor is very much smaller (36.6%). The difference is probably caused by different usage of forum. Beuchot and Bullen studied forum of doctoral university program, Wowhead on the other hand is a very informal forum. Unfortunately there was no previous study about informal forum statistics found. However, it is notable that when Beuchot and Bullen divided the humor, they found that in tendentious and innocent the ratio between the types to be

almost identical to the ratio found in Wowhead. Apparently the amount of humor varies, but the types and ratios are similar across different kinds of forums.

The important role of extra information in this study was reflected in a study conducted by Maheswaran and Sternthal. They found that expert users preferred attribute information of products in ads rather than information about benefits (1990). Wowhead users can be described as expert users based on the high quality of posts, which explains why extra information, which is similar to attribute information in ads, is held in such high esteem in Wowhead forum.

The benefit of information provided in a small size and without explanations, which expert users can make themselves, is high. Similar results were obtained by Cho, Schunn and Charney who studied what kind of response in feedback is seen as most beneficial. They found that direct instructions are the best (2006). Direct instructions in Wowhead forum can be seen as for example, coordinates, which form an important part of extra information variable data.

8.6 Afterthought

The rating a message receives is a logical result of a few simple rules which were discovered during this study. The rules of writing a message, which are intended to carry information, are slightly different to those of messages written just for the sake of it. However, the general rules apply to both types.

In both cases, the message needs to be well written, include some humor and it must give information in concise format. The length of generic messages need to be short but for a message carrying information, it can be significantly longer. If the rules are fulfilled, the message will be well received and liked by the readers. There is no magic, just logic.

The role of semantic as well as pragmatic information in messages of Wowhead forum appears to be trivial, no matter what analysis method is used. The important role of humor in messages was proven many times and it cannot be overlooked. Similarly, length and misinformation have a big impact on rating received.

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10 Appendixes

10.1 Classification Study Template

	A	B	C	D	E	F	G	H	I
1	**The message**	**Information (0-1)**				**Writing Style (0-1)**		**Humour (0-1)**	
2		**Extra Information**	**Knowledge**	**Analysis**	**Evaluation**	**Professor**	**Student**	**Innocent**	**Tendencious**
3	GM weapon, spotted on early test								
4	If u never been to ZA and wont be going soon with your guild, ask if u can join a cleared ZA raid. That way u can finish the quests Promises,								
5	Careful with percentages! Working multiplicatively it's 32% more damage (1.2 * 1.1 = 1.32). Not a lot of difference in this case								
6	Interestingly enough, Kel'thuzad's phylactery doesn't even show up in								
7	Not only is the cooldown shorter, but with a 30 yd range it'll be great								
8	Chimaera in WC3 looks almost the same as in WoW. The ones in WC3 seems to have a little more feathers though, and they are a little more								
9	Your interpretation of the 'ppm' mechanic is not entirely correct. In WoW, ppm doesn't represent a true procs-per-minute system, rather it								
10	Main City boss in Darnassus. She is located in the Temple of the Moon on the Balconey straight								
11	That's Illidan, I-l-l-i-d-a-n								
12	Does anyone have an Idea why Blizz is trying to get faster 2h's more and more? :/								

Appendix 1. Classification Study Template