# Extracting exemplars and prototypes

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December 20, 2013

## 1 Fitting a polytomous logistic regression model

Before carrying out the statistical analyses, we need to invoke the polytomous package to make it available within R, having installed the package earlier. As subsequent preliminary steps, we load in the think data frame.

```
> library(polytomous)
> data(think)
```

Next, we transform using the multinomial2logical function the multinomial predictors into dummy predictor variables, which are simply TRUE or FALSE for each categorical value of the selected multinomial variables. The think data frame has three extralinguistic variables that we have decided to exclude from the following statistical modeling, namely Register, Section, and Author (which are columns 25, 26, and 27 in the original data frame). The results of this conversion are stored in the data frame think.logical.

```
> names(think)
 [1] "Lexeme"
                                                                    "Mood"
                          "Polarity"
                                                                    "ClauseEquivalent"
 [5] "Person"
                          "Number"
                                               "Covert"
                          "Patient"
[9] "Agent"
                                               "Manner"
                                                                    "Time"
[13] "Modality1"
                          "Modalitv2"
                                               "Source"
[17] "Quantity"
                          "Location"
                                               "Duration"
                                                                    "Frequency"
[21] "MetaComment"
                          "ReasonPurpose'
                                               "Condition"
                                                                    "CoordinatedVerb"
[25] "Register"
```

> think.logical <- multinomial2logical(data=think, outcome="Lexeme", variables=names(think)[2:24])</p>

With logical predictor variables we need to exclude per each of the original multinomial predictors one variable value so that we will not end up with exact multicollinearity. Often, one ends up excluding those variable values (individual categories/classes) that can be considered the least surprising, or default values. In the case of the think data frame, such default variable values are often either designated as None (i.e. entirely absent) or Other (typically a lump category of the most infrequent variable values). For two multinomial variables, ClauseEquivalent and Overt, with only two fully complementary values in each case, one has to base the choice on one's domain knowledge, thus deciding to exclude ClauseEquivalent.FiniteVerbChain and Overt.Overt (explicit syntactic Subject argument which is not obligatory for FIRST and SECOND person verb forms in Finnish). We also need to leave out the first column with the

dependent outcome variable Lexeme (which has been retained in multinomial form. After the preceding exclusions, we are left with the following 45 logical predictor variables, which we want to incorporate into a formula for the prediction of the outcomeLexeme through a few intermediate stages. Finally, the resultant multivariate formula is stored in think.formula:

The names of all the dummy variables think.logical are the following (excluding the first column with the dependent outcome variable):

```
> names(think.logical)[-1]
 [1] "PolarityOther"
                                          "PolarityNegation"
 [3] "VoiceOther"
                                          "VoicePassive'
 [5] "MoodOther'
                                          "MoodConditional"
                                          "PersonNone'
    "MoodIndicative'
 [7]
[9] "PersonFirst'
                                          "PersonSecond"
[11] "PersonThird"
                                          "NumberOther"
[13] "NumberPlural"
                                          "CovertOvert'
    "CovertCovert"
[15]
                                          "ClauseEquivalentFiniteVerbChain"
     "ClauseEquivalentClauseEquivalent"
[17]
                                          "AgentNone
[19] "AgentGroup"
                                          "AgentIndividual"
[21] "PatientNone'
                                          "PatientAbstraction"
[23] "PatientActivity"
                                          "PatientCommunication'
[25] "PatientDirectOuote"
                                          "Patientetta.CLAUSE'
[27] "PatientIndirectQuestion"
                                          "PatientIndividualGroup'
[29] "PatientInfinitive"
                                          "PatientParticiple'
[31] "MannerNone"
                                          "MannerAgreement'
[331
     "MannerFrame
                                          "MannerGeneric'
[35] "MannerJoint'
                                          "MannerNegative
[37] "MannerPositive'
                                          "TimeNone"
[39] "TimeDefinite"
                                          "TimeIndefinite"
[41] "Modality1None"
                                          "Modality1Necessity"
[43] "Modality1Possibility"
                                          "Modality2None"
[45] "Modality2Accidental"
                                          "Modality2External"
[47] "Modality2Temporal"
                                          "Modality2Volition'
[49] "SourceNone"
                                          "SourceSource"
[51] "GoalNone"
                                          "GoalGoal"
[53] "QuantityNone"
                                          "QuantityQuantity"
[55] "LocationNone"
                                          "LocationLocation'
[57] "DurationNone"
                                          "DurationDuration"
[59] "FrequencyNone"
                                          "FrequencyFrequency"
[61] "MetaCommentNone"
                                          "MetaCommentMetaComment"
[63] "ReasonPurposeNone"
                                          "ReasonPurposeReasonPurpose"
[65] "ConditionNone
                                          "ConditionCondition'
[67] "CoordinatedVerbNone"
                                          "CoordinatedVerbCoordinatedVerb"
```

The names of the non-default dummy variables are the following:

```
grep("(Other) | (None) | (FiniteVerbChain) | (Overt) ",
     names(think.logical)[-1], value=T, invert=T)
[1] "PolarityNegation"
                                           "VoicePassive"
[3] "MoodConditional"
[5] "PersonFirst"
                                           "MoodIndicative'
                                           "PersonSecond"
[7] "PersonThird"
                                           "NumberPlural"
 [9] "CovertCovert"
                                           "ClauseEquivalentClauseEquivalent"
[11] "AgentGroup"
                                           "AgentIndividual"
[13] "PatientAbstraction"
                                           "PatientActivity"
[15] "PatientCommunication"
                                           "PatientDirectQuote"
[17] "Patientetta.CLAUSE"
                                           "PatientIndirectQuestion"
[19] "PatientIndividualGroup"
                                           "PatientInfinitive"
[21] "PatientParticiple"
                                           "MannerAgreement"
[23] "MannerFrame'
                                           "MannerGeneric"
[25] "MannerJoint"
                                           "MannerNegative'
[27] "MannerPositive"
                                           "TimeDefinite"
[29] "TimeIndefinite"
                                           "Modality1Necessity"
[31] "Modality1Possibility"
                                           "Modality2Accidental"
[33] "Modality2External"
                                           "Modality2Temporal"
```

```
[35] "Modality2Volition"
                                                                "SourceSource"
[37] "GoalGoal"
                                                                "QuantityQuantity'
[39] "LocationLocation"
                                                                "DurationDuration'
[41] "FrequencyFrequency"
                                                                "MetaCommentMetaComment'
[43] "ReasonPurposeReasonPurpose"
                                                                "ConditionCondition"
[45] "CoordinatedVerbCoordinatedVerb'
     This character vector can then be transformed into a formula as follows:
> paste(grep("(Other)|(None)|(FiniteVerbChain)|(Overt)",
       names(think.logical)[-1], value=T, invert=T), collapse="")
[1] \ "PolarityNegationVoicePassiveMoodConditionalMoodIndicativePersonFirstPersonSecondPersonThirdNumberPluralCovertifications and the property of the prope
> paste("Lexeme", paste(grep("(Other)|(None)|(FiniteVerbChain)|(Overt)'
        names(think.logical)[-1], value=T, invert=T), collapse=" + "), sep=" ~ ")
[1] "Lexeme ~ PolarityNegation + VoicePassive + MoodConditional + MoodIndicative + PersonFirst + PersonSecond + Pe
> as.formula(paste("Lexeme")
       paste(grep("(Other) | (None) | (FiniteVerbChain) | (Overt) ",
       names(think.logical)[-1],value=T,invert=T),collapse=" + "),sep=" ~ "))
Lexeme ~ PolarityNegation + VoicePassive + MoodConditional +
      MoodIndicative + PersonFirst + PersonSecond + PersonThird +
      NumberPlural + CovertCovert + ClauseEquivalentClauseEquivalent +
      AgentGroup + AgentIndividual + PatientAbstraction + PatientActivity +
      PatientCommunication + PatientDirectQuote + Patientetta.CLAUSE +
      PatientIndirectQuestion + PatientIndividualGroup + PatientInfinitive +
      PatientParticiple + MannerAgreement + MannerFrame + MannerGeneric +
      MannerJoint + MannerNegative + MannerPositive + TimeDefinite -
      TimeIndefinite + Modality1Necessity + Modality1Possibility +
      Modality2Accidental + Modality2External + Modality2Temporal +
      Modality2Volition + SourceSource + GoalGoal + QuantityQuantity +
      LocationLocation + DurationDuration + FrequencyFrequency +
      MetaCommentMetaComment + ReasonPurposeReasonPurpose + ConditionCondition +
      CoordinatedVerbCoordinatedVerb
> think.formula <- as.formula(paste("Lexeme",
       paste(grep("(Other)|(None)|(FiniteVerbChain)|(Overt)",
        names(think.logical)[-1], value=T, invert=T), collapse=" + "), sep=" ~ "))
     Now we can fit a polytomous logistic regression model, the result of which
we assign to the data frame think.polytomous:
> think.polytomous <- polytomous(think.formula, data=think.logical)
> print(summary(think.polytomous), max.print=NA)
Formula:
Lexeme ~ PolarityNegation + VoicePassive + MoodConditional +
      MoodIndicative + PersonFirst + PersonSecond + PersonThird +
      NumberPlural + CovertCovert + ClauseEquivalentClauseEquivalent +
      AgentGroup + AgentIndividual + PatientAbstraction + PatientActivity +
      PatientCommunication + PatientDirectQuote + Patientetta.CLAUSE +
      PatientIndirectQuestion + PatientIndividualGroup + PatientInfinitive +
      PatientParticiple + MannerAgreement + MannerFrame + MannerGeneric +
      MannerJoint + MannerNegative + MannerPositive + TimeDefinite +
      TimeIndefinite + Modality1Necessity + Modality1Possibility +
      Modality2Accidental + Modality2External + Modality2Temporal +
      Modality2Volition + SourceSource + GoalGoal + QuantityQuantity +
      LocationLocation + DurationDuration + FrequencyFrequency +
      MetaCommentMetaComment + ReasonPurposeReasonPurpose + ConditionCondition +
      CoordinatedVerbCoordinatedVerb
Heuristic:
one.vs.rest
Odds:
                                                                                                        pohtia
                                                           ajatella
                                                                         harkita
                                                                                        miettia
                                                               2.177
                                                                                         0.2165
(Intercept)
                                                                           0.0619
                                                                                                          0.124
                                                             0.1952
                                                                                          0.5151
AgentGroupTRUE
                                                                            (1.15)
                                                                                                          4.132
AgentIndividualTRUE
                                                           (0.8071) (0.6853)
                                                                                       (1.009)
                                                                                                          1.665
ClauseEquivalentClauseEquivalentTRUE (1.181)
                                                                          (1.984)
                                                                                          0.5822 (0.8531)
```

CoordinatedVerbCoordinatedVerbTRUE         (0.4856 (0.8283) (2.314 (0.8375) (0.746)           CovertCovertTRUE         (1.098) (0.8045) (1.2) (0.746)           DurationDurationTRUE         0.119 (1.038) 3.414 (1.26)           FrequencyFrequencyTRUE         0.384 (1.749) 1.764 (0.7861)           GoalGoalTRUE         0.2586 0.458 (0.9318) 3.675           LocationLocationTRUE         0.2586 0.458 (0.9318) 3.675           MannerAgreementTRUE         16.61 (1/Inf) 0.0707 0.2786 (1.166)           MannerFrameTRUE         2.577 0.277 0.2786 (1.166)           MannerGenericTRUE         2.577 0.277 0.2786 (1.166)           MannerJointTRUE         0.3716 (1.512) 2.091 (0.7307)           MannerPositiveTRUE         3.984 (0.5963) (0.5536) 0.2184           MannerPositiveTRUE         (0.7149) 1.846 (0.974) (0.8232)           MetaCommentMetaCommentTRUE         (0.8361) 1.624 (1.053) (0.7936)           ModalitylPossibilityTRUE         (1.182) (1.227) (1.055) (0.8118           ModalitylPossibilityTRUE         (1.182) (1.227) (1.055) (0.8118           Modality2TemporalTRUE         0.345 (1.449) 2.025 (0.9376)           Modality2TemporalTRUE         0.345 (1.449) 2.025 (0.9376)           Modality2TemporalTRUE         0.161 (1.160) (0.4212) (0.7142)           Modality2TemporalTRUE         0.1621 (1.1716) (0.4212) (0.7142)           ModOCONICIONALITE	ConditionConditionTRUE	0.457	2.885	(1.228)	(0.564)
DurationDurationTRUE         0.119 (1.038)         3.414 (1.26)           FrequencyFrequencyTRUE         0.384 (1.749)         1.764 (0.7861)           GoalGoalTRUE         3.611 0.2143 (0.5823) (0.5982)           LocationLocationTRUE         0.2586 0.458 (0.9318)         3.675           MannerAgreementTRUE         16.61 (1/Inf) 0.0707 0.225         0.0707 0.2786 (1.166)           MannerGenericTRUE         2.577 0.277 0.2786 (1.166)         (1.1ff)           MannerGenericTRUE         22.4 (1/Inf) 0.149 (1/Inf)         (1.7149) (0.7307)           MannerPositiveTRUE         0.3716 (1.512) 2.091 (0.7307)         (0.7366)           MannerPositiveTRUE         (0.7149) 1.846 (0.974) (0.8232)         (0.2184           MannerPositiveTRUE         (0.7149) 1.846 (0.974) (0.8232)         (0.2184           ModalitylRocssityTRUE         (0.3361) 1.624 (1.053) (0.7936)         (0.2184           ModalitylPossibilityTRUE         (1.182) (1.227) (1.055) (0.8118)         (0.3414)           ModalitylPossibilityTRUE         (1.182) (1.227) (1.055) (0.8118)         (0.414)           Modality2TemporalTRUE         (0.5982) (0.6531) (1.467) (1.222)         (0.7142)           Modality2TemporalTRUE         (0.5982) (0.6531) (1.467) (1.229)         (0.0600)           MoodIndicativeTRUE         (1.93) (0.8237) (0.672) (0.8055)           MoodIn	CoordinatedVerbCoordinatedVerbTRUE	0.4856	(0.8283)	2.314	(0.8375)
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LocationLocationTRUE	FrequencyFrequencyTRUE	0.384	(1.749)	1.764	(0.7861)
MannerAgreementTRUE         16.61         (1/Inf)         0.0707         0.225           MannerFrameTRUE         2.577         0.277         0.2786         (1.166)           MannerGenericTRUE         22.4         (1/Inf)         0.149         (1/Inf)           MannerJointTRUE         0.3716         (1.512)         2.091         (0.7307)           MannerNegativeTRUE         3.984         (0.5963)         (0.5536)         0.2184           MannerDeositiveTRUE         (0.8361)         1.624         (1.053)         (0.7936)           ModalitylNecessityTRUE         0.345         (1.449)         2.025         (0.9376)           ModalitylPossibilityTRUE         (1.182)         (1.227)         (1.055)         (0.8118)           Modality2AccidentalTRUE         5.84         (1/Inf)         (0.4212)         (0.4715)           Modality2TemporalTRUE         0.2612         0.1477         1.766         2.353           Modality2VolitionTRUE         (0.5982)         (0.6531)         (1.467)         (1.229)           MoodIndicativeTRUE         (1.273)         2.323         0.5446         (0.6908)           MoodIndicativeTRUE         (1.54)         (1.211)         0.595         1.548           PatientAbstractionTRUE </td <td>GoalGoalTRUE</td> <td>3.611</td> <td>0.2143</td> <td>(0.5823)</td> <td>(0.5989)</td>	GoalGoalTRUE	3.611	0.2143	(0.5823)	(0.5989)
MannerFrameTRUE         2.577         0.277         0.2786         (1.166)           MannerGenericTRUE         22.4         (1/Inf)         0.149         (1/Inf)           MannerNegativeTRUE         0.3716         (1.512)         2.091         (0.7307)           MannerNegativeTRUE         3.984         (0.5963)         (0.5536)         0.2184           MannerPositiveTRUE         (0.8361)         1.624         (1.053)         (0.7936)           Modality1NecessityTRUE         (0.345         (1.449)         2.025         (0.9376)           Modality1PossibilityTRUE         (1.182)         (1.227)         (1.055)         (0.8118)           Modality2ExternalTRUE         5.84         (1/Inf)         (0.4212)         (0.4715)           Modality2ExternalTRUE         0.2612         0.1477         1.766         2.353           Modality2VolitionTRUE         (0.5982)         (0.6531)         (1.467)         (1.229)           MoodIndicativeTRUE         (1.273)         2.323         0.5446         (0.6908)           Modality2VolitionTRUE         (1.54)         (1.211)         0.595         1.548           Modality2VolitionTRUE         (1.273)         2.323         0.5446         (0.6908)           Modality2Voliti	LocationLocationTRUE	0.2586	0.458	(0.9318)	3.675
MannerGenericTRUE         22.4 (1/Inf)         0.149 (1/Inf)           MannerJointTRUE         0.3716 (1.512)         2.091 (0.7307)           MannerNegativeTRUE         3.984 (0.5963)         (0.5536)         0.2184           MannerPositiveTRUE         (0.7149)         1.846 (0.974) (0.8232)           MetaCommentMetaCommentTRUE         (0.8361)         1.624 (1.053) (0.7936)           ModalityINecessityTRUE         0.345 (1.449)         2.025 (0.9376)           ModalityPossibilityTRUE         (1.182) (1.227) (1.055) (0.8118)           Modality2AccidentalTRUE         5.84 (1/Inf) (0.4212) (0.4715)           Modality2ExternalTRUE         2.584 (0.8987) (0.7864) (0.7142)           Modality2TemporalTRUE         0.2612 (0.1477) (1.766 (2.353)           Modality2VolitionTRUE         (0.5982) (0.6531) (1.467) (1.229)           MoodIndicativeTRUE         (1.273) (2.323) (0.672) (0.8055)           NumberPluralTRUE         (1.273) (2.323) (0.672) (0.8055)           NumberPluralTRUE         (1.154) (1.211) (0.595 (0.672) (0.8055)           NumberPluralTRUE         (1.54) (1.211) (0.595 (0.672) (0.8055)           NumberPluralTRUE         (1.54) (1.211) (0.595 (0.672) (0.8055)           NumberPluralTRUE         (1.154) (1.211) (0.595 (0.7723) (1.744           PatientActivityTRUE         (0.1081) (1.878) (0.7723) (0.7723) (1.744	MannerAgreementTRUE	16.61	(1/Inf)	0.0707	0.225
MannerJointTRUE         0.3716 (1.512) (0.5963) (0.5536) (0.2184           MannerNegativeTRUE         3.984 (0.5963) (0.5536) (0.2184           MannerPositiveTRUE         (0.7149) 1.846 (0.974) (0.8232)           MetaCommentMetaCommentTRUE         (0.8361) 1.624 (1.053) (0.7936)           Modality1NecessityTRUE         0.345 (1.449) 2.025 (0.9376)           Modality2PossibilityTRUE         (1.182) (1.227) (1.055) (0.8118)           Modality2AccidentalTRUE         5.84 (1/Inf) (0.4212) (0.4715)           Modality2ExternalTRUE         2.584 (0.8987) (0.7864) (0.7142)           Modality2TemporalTRUE         0.2612 (0.1477) (1.766 (2.353)           Modality2VolitionTRUE         (0.5982) (0.6531) (1.467) (1.229)           MoodIndicativeTRUE         (1.273) (0.8237) (0.672) (0.8055)           MoodIndicativeTRUE         (1.993) (0.8237) (0.672) (0.8055)           NumberPluralTRUE         (1.154) (1.211) (1.595) (0.595) (0.595)           NumberPluralTRUE         (1.154) (1.211) (1.595) (0.795) (0.8055)           NumberPluralTRUE         (1.154) (1.211) (1.571) (0.672) (0.8055)           NumberPluralTRUE         (0.1374 (9.293) (0.7723) (0.7723) (0.744)           PatientActivityTRUE         (0.1374 (9.293) (0.7723) (0.7723) (0.744)           PatientDirectQuoteTRUE         (0.0921 (1/Inf) (3.172 (3.789) (0.794) (0.3345)           PatientIndividualGroupTRUE         (0.7021	MannerFrameTRUE	2.577	0.277	0.2786	(1.166)
MannerNegativeTRUE         3.984 (0.5963) (0.5536)         0.2184           MannerPositiveTRUE         (0.7149)         1.846 (0.974) (0.8232)           MetaCommentMetaCommentTRUE         (0.8361)         1.624 (1.053) (0.7936)           ModalityNecessityTRUE         0.345 (1.449)         2.025 (0.9376)           Modality2PossibilityTRUE         (1.182) (1.227) (1.055) (0.8118)           Modality2AccidentalTRUE         5.84 (1/Inf) (0.4212) (0.4715)           Modality2ExternalTRUE         0.2612 (0.1477 (0.7864) (0.7142)           Modality2VolitionTRUE         0.2612 (0.1477 (0.7864) (0.7142)           Modality2VolitionTRUE         (0.5982) (0.6531) (1.467) (1.229)           MoodConditionalTRUE         (0.5982) (0.6531) (1.467) (1.229)           MoodIndicativeTRUE         (1.933) (0.8237) (0.672) (0.672) (0.8055)           NumberPluralTRUE         (1.154) (1.211) (0.595 (0.8058)           NumberPluralTRUE         (1.154) (1.211) (0.595 (0.755) (0.8058)           PatientAbstractionTRUE         (0.1374 (0.8237) (0.672) (0.672) (0.8055)           NumberPluralTRUE         (0.1374 (0.923) (0.7723) (0.7723) (0.7723) (0.7723) (0.7723) (0.7723) (0.7723) (0.7724)         1.548           PatientDirectQuoteTRUE         (0.181 (0.878) (0.8492) (0.783) (0.7723) (0.7846)         2.847           PatientIndirectQuestionTRUE         (0.702) (0.8452) (0.8492) (0.8492) (0.8492) (0.8492) (0.8492)	MannerGenericTRUE	22.4	(1/Inf)	0.149	(1/Inf)
MannerPositiveTRUE         (0.7149)         1.846         (0.974)         (0.8232)           MetaCommentMetaCommentTRUE         (0.8361)         1.624         (1.053)         (0.7936)           ModalityINecessityTRUE         0.345         (1.449)         2.025         (0.9376)           ModalityPossibilityTRUE         (1.182)         (1.227)         (1.055)         (0.8118)           ModalityZecternalTRUE         5.84         (1/Inf)         (0.4212)         (0.7142)           Modality2TemporalTRUE         2.584         (0.8987)         (0.7864)         (0.7142)           Modality2TemporalTRUE         0.2612         0.1477         1.766         2.353           Modality2VolitionTRUE         (0.5982)         (0.6531)         (1.467)         (1.229)           MoodIndicativeTRUE         (1.273)         2.323         0.5446         (0.6908)           MoodIndicativeTRUE         1.993         (0.8237)         (0.672)         (0.8055)           NumberPluralTRUE         (1.154)         (1.211)         0.595         1.548           PatientAbstractionTRUE         (1.374         9.293         (0.7723)         1.744           PatientActivityTRUE         (0.1374         9.293         (0.7723)         1.744	MannerJointTRUE	0.3716	(1.512)	2.091	(0.7307)
MetaCommentMetaCommentTRUE         (0.8361)         1.624         (1.053)         (0.7936)           Modality1NecessityTRUE         0.345         (1.449)         2.025         (0.9376)           Modality1PossibilityTRUE         (1.182)         (1.227)         (1.055)         (0.8118)           Modality2AccidentalTRUE         5.84         (1/Inf)         (0.4212)         (0.4715)           Modality2TemporalTRUE         2.584         (0.8987)         (0.7864)         (0.7142)           Modality2TomporalTRUE         0.2612         0.1477         1.766         2.353           Modality2VolitionTRUE         (0.5982)         (0.6531)         (1.467)         (1.229)           MoodIndicativeTRUE         (1.273)         2.323         0.5446         (0.6908)           MoodIndicativeTRUE         (1.154)         (1.211)         0.595         1.548           PatientAbstractionTRUE         (1.154)         (1.211)         0.595         1.548           PatientAbstractionTRUE         0.1374         9.293         (0.7723)         1.744           PatientDirectQuoteTRUE         0.1081         (1.878)         2.68         3.07           PatientDirectQuoteTRUE         0.07091         (0.8492)         4.145         2.847	MannerNegativeTRUE	3.984	(0.5963)	(0.5536)	0.2184
Modality1NecessityTRUE         0.345         (1.449)         2.025         (0.9376)           Modality1PossibilityTRUE         (1.182)         (1.227)         (1.055)         (0.8118)           Modality2AccidentalTRUE         5.84         (1/Inf)         (0.4212)         (0.4715)           Modality2ExternalTRUE         2.584         (0.8987)         (0.7664)         (0.71142)           Modality2TemporalTRUE         0.2612         0.1477         1.766         2.353           Modality2VolitionTRUE         (0.5982)         (0.6531)         (1.467)         (1.229)           MoodConditionalTRUE         (1.273)         2.323         0.5446         (0.6908)           MoodIndicativeTRUE         1.993         (0.8237)         (0.672)         (0.8055)           NumberPluralTRUE         (1.154)         (1.211)         0.595         1.548           PatientAbstractionTRUE         0.2369         (1.077)         1.511         4.383           PatientActivityTRUE         0.1374         9.293         (0.7723)         1.744           PatientDirectQuoteTRUE         0.1081         (1.878)         2.68         3.07           PatientIndivicualGroupTRUE         0.7091         (0.8492)         4.145         2.847 <th< td=""><td>MannerPositiveTRUE</td><td>(0.7149)</td><td>1.846</td><td>(0.974)</td><td>(0.8232)</td></th<>	MannerPositiveTRUE	(0.7149)	1.846	(0.974)	(0.8232)
Modality1PossibilityTRUE         (1.182)         (1.227)         (1.055)         (0.8118)           Modality2AccidentalTRUE         5.84         (1/Inf)         (0.4212)         (0.4715)           Modality2ExternalTRUE         2.584         (0.8987)         (0.7864)         (0.7142)           Modality2TemporalTRUE         0.2612         0.1477         1.766         2.353           Modality2VolitionTRUE         (0.5982)         (0.6531)         (1.467)         (1.229)           MoodConditionalTRUE         (1.273)         2.323         0.5446         (0.6908)           MoodIndicativeTRUE         1.993         (0.8237)         (0.672)         (0.8055)           MoodIndicativeTRUE         1.993         (0.8237)         (0.672)         (0.8055)           MoodIndicativeTRUE         1.993         (0.8237)         (0.672)         (0.8055)           Modality2VolitionTRUE         1.993         (0.8237)         (0.672)         (0.8055)           MoodIndicativeTRUE         1.993         (0.8237)         (0.672)         (0.8055)           MoodIndicativeTRUE         1.993         (0.8237)         (0.672)         (0.8055)         1.548           PatientAbstractionTRUE         0.2369         (1.077)         1.511         4.383 <td>MetaCommentMetaCommentTRUE</td> <td>(0.8361)</td> <td>1.624</td> <td>(1.053)</td> <td>(0.7936)</td>	MetaCommentMetaCommentTRUE	(0.8361)	1.624	(1.053)	(0.7936)
Modality2AccidentalTRUE         5.84         (1/Inf)         (0.4212)         (0.4715)           Modality2ExternalTRUE         2.584         (0.8987)         (0.7864)         (0.7142)           Modality2TemporalTRUE         0.2612         0.1477         1.766         2.353           Modality2VolitionTRUE         (0.5982)         (0.6531)         (1.467)         (1.229)           MoodConditionalTRUE         (1.273)         2.323         0.5446         (0.6908)           MoodIndicativeTRUE         1.993         (0.8237)         (0.672)         (0.8055)           NumberPluralTRUE         (1.154)         (1.211)         0.595         1.548           PatientActivityTRUE         0.2369         (1.077)         1.511         4.383           PatientCommunicationTRUE         0.1081         (1.878)         2.68         3.07           PatientDirectQuoteTRUE         0.1081         (1.878)         2.68         3.07           PatientIndirictQuoteTRUE         0.09921         (1/Inf)         3.172         8.789           PatientIndividualGroupTRUE         2.747         (1.008)         0.3704         0.3345           PatientParticipleTRUE         5.738         (1.024)         (1/Inf)         (0.2253)           Patie	Modality1NecessityTRUE	0.345	(1.449)	2.025	(0.9376)
Modality2ExternalTRUE         2.584 (0.8987)         (0.7864)         (0.7142)           Modality2TemporalTRUE         0.2612 (0.1477 (1.766 (2.353))         (0.7864)         (0.7142)           Modality2TemporalTRUE         (0.5982) (0.6531)         (1.467) (1.229)           MoodIndicativeTRUE         (1.273) (2.323)         0.5446 (0.6908)           MoodIndicativeTRUE         1.993 (0.8237) (0.672) (0.8055)           NumberPluralTRUE         (1.154) (1.211) (0.595 (1.548)           PatientAbstractionTRUE         0.2369 (1.077) (1.511 (4.383)           PatientActivityTRUE         0.1374 (9.293) (0.7723) (0.7723) (1.744)           PatientDirectQuoteTRUE         0.1081 (1.878) (1.878) (2.68 (3.07)           PatientDirectQuoteTRUE         0.00921 (1/Inf) (3.172 (8.789)           PatientIndirectQuestionTRUE         0.07091 (0.8492) (1.716) (3.345)           PatientIndirividualGroupTRUE         2.747 (1.008) (0.3704 (1.716) (0.2253)           PatientParticipleTRUE         5.171 (1.486) (1/Inf) (0.2253)           PatientParticipleTRUE         5.738 (1.024) (1/Inf) (0.2336)           PatientParticipleTRUE         (0.8882) (1.814) (1.731) (0.2754           PersonFeconTruE         (0.654) (1.504) (1.262) (0.9667)           PolarityNegationTRUE         (0.654) (1.504) (1.504) (1.262) (0.9667)           PolarityNegationTRUE         (0.6843) (0.3387 (2.60	Modality1PossibilityTRUE	(1.182)	(1.227)	(1.055)	(0.8118)
Modality2TemporalTRUE         0.2612         0.1477         1.766         2.353           Modality2VolitionTRUE         (0.5982)         (0.6531)         (1.467)         (1.229)           MoodConditionalTRUE         (1.273)         2.323         0.5446         (0.6908)           MoodIndicativeTRUE         1.993         (0.8237)         (0.672)         (0.8055)           NumberPluralTRUE         (1.154)         (1.211)         0.595         1.548           PatientAbstractionTRUE         0.2369         (1.077)         1.511         4.383           PatientActivityTRUE         0.1374         9.293         (0.7723)         1.744           PatientCommunicationTRUE         0.1081         (1.878)         2.68         3.07           PatientDirectQuoteTRUE         0.0921         (1/1f)         3.172         8.789           PatientIndirectQuestionTRUE         0.07091         (0.8492)         4.145         2.847           PatientIndirivdualGroupTRUE         2.747         (1.008)         0.3704         0.3345           PatientParticipleTRUE         5.731         (1.486)         (1/1nf)         (0.2253)           PatientParticipleTRUE         5.738         (1.024)         (1/5nf)         (0.2253)           Perso	Modality2AccidentalTRUE	5.84	(1/Inf)	(0.4212)	(0.4715)
Modality2VolitionTRUE         (0.5982)         (0.6531)         (1.467)         (1.229)           MoodConditionalTRUE         (1.273)         2.323         0.5446         (0.6908)           MoodIndicativeTRUE         1.993         (0.8237)         (0.672)         (0.8055)           NumberPluralTRUE         (1.154)         (1.211)         0.595         1.548           PatientAbstractionTRUE         0.2369         (1.077)         1.511         4.383           PatientActivityTRUE         0.1374         9.293         (0.7723)         1.744           PatientCommunicationTRUE         0.1081         (1.878)         2.68         3.07           PatientDirectQuoteTRUE         0.09921         (1/Inf)         3.172         8.789           PatientIndirectQuestionTRUE         0.07091         (0.8492)         4.145         2.847           PatientIndirictiveTRUE         2.747         (1.008)         0.3704         0.3345           PatientParticipleTRUE         5.738         (1.024)         (1/Inf)         (0.2253)           Patientetta.CLAUSETRUE         2.583         0.2616         0.509         0.5163           PersonFirstTRUE         (0.8882)         (1.814)         (1.731)         0.2754           PersonThirdT	Modality2ExternalTRUE	2.584	(0.8987)	(0.7864)	(0.7142)
MoodConditionalTRUE         (1.273)         2.323         0.5446         (0.6908)           MoodIndicativeTRUE         1.993         (0.8237)         (0.672)         (0.8055)           NumberPluralTRUE         (1.154)         (1.211)         0.595         1.548           PatientAbstractionTRUE         0.2369         (1.077)         1.511         4.383           PatientActivityTRUE         0.1374         9.293         (0.7723)         1.744           PatientCommunicationTRUE         0.1081         (1.878)         2.68         3.07           PatientDirectQuoteTRUE         0.00921         (1/Inf)         3.172         8.789           PatientIndirectQuoteTRUE         0.07091         (0.8492)         4.145         2.847           PatientIndirivetRUE         2.747         (1.008)         0.3704         0.3345           PatientParticipleTRUE         5.711         (1.486)         (1/Inf)         (0.2253)           PatientParticipleTRUE         5.738         (1.024)         (1/Inf)         (0.2336)           PersonFirstTRUE         (0.8882)         (1.814)         (1.731)         0.2754           PersonSecondTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityNegationTRUE	Modality2TemporalTRUE	0.2612	0.1477	1.766	2.353
MoodIndicativeTRUE         1.993 (0.8237) (0.672) (0.8055)           NumberPluralTRUE         (1.154) (1.211) (0.595 (1.548)           PatientAbstractionTRUE         0.2369 (1.077) (1.071) (1.511 (4.383)           PatientActivityTRUE         0.1374 (9.293) (0.7723) (0.7723) (1.744)           PatientCommunicationTRUE         0.1081 (1.878) (1.878) (2.68 (3.07)           PatientDirectQuoteTRUE         0.00921 (1/Inf) (3.172 (8.789)           PatientIndirectQuestionTRUE         0.07091 (0.8492) (1.716) (0.3345)           PatientIndividualGroupTRUE         2.747 (1.008) (0.3704 (0.3345)           PatientParticipleTRUE         5.171 (1.486) (1/Inf) (0.2253)           PatientParticipleTRUE         5.738 (1.024) (1/Inf) (0.3336)           Patientetta.CLAUSETRUE         2.583 (1.024) (1/Inf) (0.3336)           PersonFirstTRUE         (0.8882) (1.814) (1.731) (0.2754           PersonSecondTRUE         (0.654) (1.504) (1.262) (0.9667)           PolarityNegationTRUE         (0.654) (1.504) (1.262) (0.9667)           PolarityQuantityTRUE         (0.6843) (0.3387 (2.607) (0.7461)           ReasonPurposeReasonPurposeTRUE         (0.4337) (1.617) (1.066) (1.239)           SourceSourceTRUE         (0.4039) (0.774) (0.9586) (0.755) (0.2869)           TimeIndefiniteTRUE         (0.4039) (0.774) (0.9586) (0.9751)	Modality2VolitionTRUE	(0.5982)	(0.6531)	(1.467)	(1.229)
NumberPluralTRUE         (1.154)         (1.211)         0.595         1.548           PatientAbstractionTRUE         0.2369         (1.077)         1.511         4.383           PatientActivityTRUE         0.1374         9.293         (0.7723)         1.744           PatientCommunicationTRUE         0.1081         (1.878)         2.68         3.07           PatientDirectQuoteTRUE         0.00921         (1/Inf)         3.172         8.789           PatientIndirectQuestionTRUE         0.07091         (0.8492)         4.145         2.847           PatientIndividualGroupTRUE         2.747         (1.008)         0.3704         0.3345           PatientIndividualGroupTRUE         5.171         (1.486)         (1/Inf)         (0.2253)           PatientParticipleTRUE         5.738         (1.024)         (1/Inf)         (0.233)           Patientetta.CLAUSETRUE         2.583         0.2616         0.509         0.5163           PersonFirstTRUE         (0.8882)         (1.814)         (1.731)         0.2754           PersonThirdTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityNegationTRUE         (2.136         (1.14         0.705         0.4665           QuantityQuan	MoodConditionalTRUE	(1.273)	2.323	0.5446	(0.6908)
PatientAbstractionTRUE         0.2369         (1.077)         1.511         4.383           PatientActivityTRUE         0.1374         9.293         (0.7723)         1.744           PatientCommunicationTRUE         0.1081         (1.878)         2.68         3.07           PatientDirectQuoteTRUE         0.00921         (1/Inf)         3.172         8.789           PatientIndirectQuestionTRUE         0.07091         (0.8492)         4.145         2.847           PatientIndividualGroupTRUE         2.747         (1.008)         0.3704         0.3345           PatientInfinitiveTRUE         5.771         (1.486)         (1/Inf)         (0.2253)           PatientParticipleTRUE         5.738         (1.024)         (1/Inf)         (0.2253)           Patientetta.CLAUSETRUE         2.583         0.2616         0.509         0.5163           PersonFirstTRUE         (0.8882)         (1.814)         (1.731)         0.2754           PersonEcondTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityNegationTRUE         (0.654)         (1.504)         (1.262)         (0.7461)           ReasonPurposeReasonPurposeTRUE         0.4337         (1.617)         (1.066)         (1.239)	MoodIndicativeTRUE	1.993	(0.8237)	(0.672)	(0.8055)
PatientActivityTRUE         0.1374         9.293         (0.7723)         1.744           PatientCommunicationTRUE         0.1081         (1.878)         2.68         3.07           PatientDirectQuoteTRUE         0.00921         (1/Inf)         3.172         8.789           PatientIndirectQuestionTRUE         0.07091         (0.8492)         4.145         2.847           PatientIndividualGroupTRUE         2.747         (1.008)         0.3704         0.3345           PatientInfinitiveTRUE         5.171         (1.486)         (1/Inf)         (0.2253)           PatientParticipleTRUE         5.738         (1.024)         (1/Inf)         (0.3336)           Patientetta.CLAUSETRUE         2.583         0.2616         0.509         0.5163           PersonFirstTRUE         (0.8882)         (1.814)         (1.731)         0.2754           PersonSecondTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityNegationTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityQuantityTRUE         (0.6843)         0.3387         2.607         (0.7461)           ReasonPurposeReasonPurposeTRUE         3.129         (0.1365)         (0.755)         0.2869	NumberPluralTRUE	(1.154)	(1.211)	0.595	1.548
PatientCommunicationTRUE         0.1081         (1.878)         2.68         3.07           PatientDirectQuoteTRUE         0.00921         (1/Inf)         3.172         8.789           PatientIndirectQuestionTRUE         0.07091         (0.8492)         4.145         2.847           PatientIndividualGroupTRUE         2.747         (1.008)         0.3704         0.3345           PatientInfinitiveTRUE         5.171         (1.466)         (1/Inf)         (0.2253)           PatientParticipleTRUE         5.738         (1.024)         (1/Inf)         (0.3336)           Patientetta.CLAUSETRUE         2.583         0.2616         0.509         0.5163           PersonFirstTRUE         (0.8882)         (1.814)         (1.731)         0.2754           PersonSecondTRUE         (0.7091)         (0.6777)         (2.368         0.4054           PersonThirdTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityNegationTRUE         2.136         (1.14)         0.705         0.4665           QuantityQuantityTRUE         (0.6843)         0.3387         2.607         (0.7461)           ReasonPurposeReasonPurposeTRUE         3.129         (0.1365)         (0.755)         0.2869           <	PatientAbstractionTRUE	0.2369	(1.077)	1.511	4.383
PatientDirectQuoteTRUE         0.00921         (1/Inf)         3.172         8.789           PatientIndirectQuestionTRUE         0.07091         (0.8492)         4.145         2.847           PatientIndividualGroupTRUE         2.747         (1.008)         0.3704         0.3345           PatientInfinitiveTRUE         5.171         (1.486)         (1/Inf)         (0.2253)           PatientParticipleTRUE         5.738         (1.024)         (1/Inf)         (0.3336)           Patientetta.CLAUSETRUE         2.583         0.2616         0.509         0.5163           PersonFirstTRUE         (0.8882)         (1.814)         (1.731)         0.2754           PersonSecondTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityNegationTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityQuantityTRUE         (0.6843)         0.3387         2.607         (0.7461)           ReasonPurposeReasonPurposeTRUE         0.4337         (1.617)         (1.066)         (1.239)           SourceSourceTRUE         3.129         (0.1365)         (0.755)         0.2869           TimeDefiniteTRUE         0.4039         (0.774)         (0.9586)         2.254	PatientActivityTRUE	0.1374	9.293	(0.7723)	1.744
PatientIndirectQuestionTRUE         0.07091         (0.8492)         4.145         2.847           PatientIndividualGroupTRUE         2.747         (1.008)         0.3704         0.3345           PatientInfinitiveTRUE         5.171         (1.486)         (1/Inf)         (0.2253)           PatientParticipleTRUE         5.738         (1.024)         (1/Inf)         (0.3336)           Patientetta.CLAUSETRUE         2.583         0.2616         0.509         0.5163           PersonFirstTRUE         (0.8882)         (1.814)         (1.731)         0.2754           PersonSecondTRUE         (0.6791)         (0.6757)         2.368         0.4054           PersonThirdTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityNegationTRUE         2.136         (1.14)         0.705         0.4665           QuantityQuantityTRUE         (0.6843)         0.3387         2.607         (0.7461)           ReasonPurposeReasonPurposeTRUE         3.129         (0.1365)         (0.755)         0.2869           SourceSourceTRUE         3.129         (0.1365)         (0.755)         0.2869           TimeDefiniteTRUE         0.4039         (0.774)         (0.9586)         2.254           TimeI	PatientCommunicationTRUE	0.1081	(1.878)	2.68	3.07
PatientIndividualGroupTRUE         2.747         (1.008)         0.3704         0.3345           PatientInfinitiveTRUE         5.171         (1.486)         (1/Inf)         (0.2253)           PatientParticipleTRUE         5.738         (1.024)         (1/Inf)         (0.3336)           Patientetta.CLAUSETRUE         2.583         0.2616         0.509         0.5163           PersonFirstTRUE         (0.8882)         (1.814)         (1.731)         0.2754           PersonSecondTRUE         (0.7091)         (0.6757)         2.368         0.4054           PersonThirdTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityNegationTRUE         2.136         (1.14)         0.705         0.4665           QuantityQuantityTRUE         (0.6843)         0.3387         2.607         (0.7461)           ReasonPurposeReasonPurposeTRUE         3.129         (0.1365)         (0.755)         0.2869           TimeDefiniteTRUE         0.4039         (0.744)         (0.9586)         2.254           TimeIndefiniteTRUE         0.5772         (1.241)         1.508         (0.9791)	PatientDirectQuoteTRUE	0.00921	(1/Inf)	3.172	8.789
PatientInfinitiveTRUE         5.171         (1.486)         (1/Inf)         (0.2253)           PatientParticipleTRUE         5.738         (1.024)         (1/Inf)         (0.3336)           Patientetta.CLAUSETRUE         2.583         0.2616         0.509         0.5163           PersonFirstTRUE         (0.8882)         (1.814)         (1.731)         0.2754           PersonSecondTRUE         (0.7091)         (0.6757)         2.368         0.4054           PersonThirdTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityNegationTRUE         2.136         (1.14)         0.705         0.4665           QuantityQuantityTRUE         (0.6843)         0.3387         2.607         (0.7461)           ReasonPurposeReasonPurposeTRUE         3.129         (0.1365)         (0.755)         0.2869           SourceSourceTRUE         3.129         (0.1365)         (0.755)         0.2869           TimeDefiniteTRUE         0.4039         (0.744)         (0.9586)         2.254           TimeIndefiniteTRUE         0.5772         (1.241)         1.508         (0.9791)	PatientIndirectQuestionTRUE	0.07091	(0.8492)	4.145	2.847
PatientParticipleTRUE         5.738         (1.024)         (1/Inf)         (0.3336)           Patientetta.CLAUSETRUE         2.583         0.2616         0.509         0.5163           PersonFirstTRUE         (0.8882)         (1.814)         (1.731)         0.2754           PersonSecondTRUE         (0.7091)         (0.6757)         2.368         0.4054           PersonThirdTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityNegationTRUE         2.136         (1.14)         0.705         0.4665           QuantityQuantityTRUE         (0.6843)         0.3387         2.607         (0.7461)           ReasonPurposeReasonPurposeTRUE         0.4337         (1.617)         (1.066)         (1.239)           SourceSourceTRUE         3.129         (0.1365)         (0.755)         0.2869           TimeDefiniteTRUE         0.4039         (0.774)         (0.9586)         2.254           TimeIndefiniteTRUE         0.5772         (1.241)         1.508         (0.9791)	PatientIndividualGroupTRUE	2.747	(1.008)	0.3704	0.3345
Patientetta.CLAUSETRUE         2.583         0.2616         0.509         0.5163           PersonFirstTRUE         (0.8882)         (1.814)         (1.731)         0.2754           PersonSecondTRUE         (0.7091)         (0.6757)         2.368         0.4054           PersonThirdTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityNegationTRUE         2.136         (1.14)         0.705         0.4665           QuantityQuantityTRUE         (0.6843)         0.3387         2.607         (0.7461)           ReasonPurposeReasonPurposeTRUE         3.129         (0.1365)         (0.755)         0.2869           SourceSourceTRUE         0.4039         (0.774)         (0.9586)         2.254           TimeDefiniteTRUE         0.5772         (1.241)         1.508         (0.9791)	PatientInfinitiveTRUE	5.171	(1.486)	(1/Inf)	(0.2253)
PersonFirstTRUE         (0.8882)         (1.814)         (1.731)         0.2754           PersonSecondTRUE         (0.7091)         (0.6757)         2.368         0.4054           PersonThirdTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityNegationTRUE         2.136         (1.14)         0.705         0.4665           QuantityQuantityTRUE         (0.6843)         0.3387         2.607         (0.7461)           ReasonPurposeReasonPurposeTRUE         0.4337         (1.617)         (1.066)         (1.239)           SourceSourceTRUE         3.129         (0.1365)         (0.755)         0.2869           TimeDefiniteTRUE         0.4039         (0.774)         (0.9586)         2.254           TimeIndefiniteTRUE         0.5772         (1.241)         1.508         (0.9791)	PatientParticipleTRUE	5.738	(1.024)	(1/Inf)	(0.3336)
PersonSecondTRUE         (0.7091)         (0.6757)         2.368         0.4054           PersonThirdTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityNegationTRUE         2.136         (1.14)         0.705         0.4665           QuantityQuantityTRUE         (0.6843)         0.3387         2.607         (0.7461)           ReasonPurposeReasonPurposeTRUE         0.4337         (1.617)         (1.066)         (1.239)           SourceSourceTRUE         3.129         (0.1365)         (0.755)         0.2869           TimeDefiniteTRUE         0.4039         (0.774)         (0.9586)         2.254           TimeIndefiniteTRUE         0.5772         (1.241)         1.508         (0.9791)	Patientetta.CLAUSETRUE	2.583	0.2616	0.509	0.5163
PersonThirdTRUE         (0.654)         (1.504)         (1.262)         (0.9667)           PolarityNegationTRUE         2.136         (1.14)         0.705         0.4665           QuantityQuantityTRUE         (0.6843)         0.3387         2.607         (0.7461)           ReasonPurposeReasonPurposeTRUE         0.4337         (1.617)         (1.066)         (1.239)           SourceSourceTRUE         3.129         (0.1365)         (0.755)         0.2869           TimeDefiniteTRUE         0.4039         (0.774)         (0.9586)         2.254           TimeIndefiniteTRUE         0.5772         (1.241)         1.508         (0.9791)	PersonFirstTRUE	(0.8882)	(1.814)	(1.731)	0.2754
PolarityNegationTRUE         2.136         (1.14)         0.705         0.4665           QuantityQuantityTRUE         (0.6843)         0.3387         2.607         (0.7461)           ReasonPurposeReasonPurposeTRUE         0.4337         (1.617)         (1.066)         (1.239)           SourceSourceTRUE         3.129         (0.1365)         (0.755)         0.2869           TimeDefiniteTRUE         0.4039         (0.774)         (0.9586)         2.254           TimeIndefiniteTRUE         0.5772         (1.241)         1.508         (0.9791)	PersonSecondTRUE	(0.7091)	(0.6757)	2.368	0.4054
QuantityQuantityTRUE     (0.6843)     0.3387     2.607     (0.7461)       ReasonPurposeReasonPurposeTRUE     0.4337     (1.617)     (1.066)     (1.239)       SourceSourceTRUE     3.129     (0.1365)     (0.755)     0.2869       TimeDefiniteTRUE     0.4039     (0.774)     (0.9586)     2.254       TimeIndefiniteTRUE     0.5772     (1.241)     1.508     (0.9791)	PersonThirdTRUE	(0.654)	(1.504)	(1.262)	(0.9667)
ReasonPurposeReasonPurposeTRUE       0.4337 (1.617) (1.066) (1.239)         SourceSourceTRUE       3.129 (0.1365) (0.755) 0.2869         TimeDefiniteTRUE       0.4039 (0.774) (0.9586) 2.254         TimeIndefiniteTRUE       0.5772 (1.241) 1.508 (0.9791)	PolarityNegationTRUE	2.136	(1.14)	0.705	0.4665
ReasonPurposeReasonPurposeTRUE       0.4337 (1.617) (1.066) (1.239)         SourceSourceTRUE       3.129 (0.1365) (0.755) 0.2869         TimeDefiniteTRUE       0.4039 (0.774) (0.9586) 2.254         TimeIndefiniteTRUE       0.5772 (1.241) 1.508 (0.9791)	QuantityQuantityTRUE	(0.6843)	0.3387	2.607	(0.7461)
TimeDefiniteTRUE 0.4039 (0.774) (0.9586) 2.254 TimeIndefiniteTRUE 0.5772 (1.241) 1.508 (0.9791)	ReasonPurposeTRUE	0.4337		(1.066)	(1.239)
TimeIndefiniteTRUE 0.5772 (1.241) 1.508 (0.9791)	SourceSourceTRUE	3.129	(0.1365)	(0.755)	0.2869
	TimeDefiniteTRUE	0.4039	(0.774)	(0.9586)	2.254
VoicePassiveTRUE (0.6373) (1.101) (0.8802) 1.84	TimeIndefiniteTRUE	0.5772	(1.241)	1.508	(0.9791)
	VoicePassiveTRUE	(0.6373)	(1.101)	(0.8802)	1.84
Null deviance: 8701 on 13616 degrees of freedom	Null deviance: 8701 on	13616	degrees of	ffreedom	

Null deviance: 8701 on 13616 degrees of freedom Residual (model) deviance: 5981 on 13432 degrees of freedom

R2.likelihood: 0.3125 AIC: 6349 BIC: 7478

The polytomous logistic regression model is the basis of both extracting a set of exemplary exemplars as well as sets of properties (variable values) which are prototypical for each outcome (i.e. Lexeme).

# 2 Extracting exemplars and prototypes

Having fit the polytomous logistic regression model, we can use it as a basis for extracting individual contexts which are most exemplary of the various outcomes, using the function extract.exemplars. This function takes the dataset incorporated in the fitted result and applies *Hierarchical Cluster Analysis* on it with the function hclust, using method="binary" for distance measure and method="ward" for the distance-based clustering:

#### > extract.exemplars(think.polytomous, n.clusters=100) indices outcomes max.probs pohtia 0.7522760 899 286 286 pohtia 0.7197809 pohtia 0.6736778 514 514 1648 miettia 0.7680341 1648 3233 ajatella 0.9905042 3233 3035 3035 ajatella 0.8284270 2637 2637 ajatella 0.8995969 1171 ajatella 0.9813306 1171 3162 pohtia 0.6292819 1991 pohtia 0.6205248 3162 1991 2422 2422 ajatella 0.9384550 121 ajatella 0.6648627 121 255 255 harkita 0.5131767 2015 2015 ajatella 0.9814404 2482 ajatella 0.8895892 2482 19 ajatella 0.9893241 1387 pohtia 0.7458646 19 1387 76 76 ajatella 0.3894004 3112 3112 ajatella 0.7909073 1856 1856 ajatella 0.9842436 1684 1684 ajatella 0.9238340 574 574 ajatella 0.8194565 1521 1521 ajatella 0.9874202 151 151 ajatella 0.9407626 558 558 miettia 0.8239422 1891 1891 ajatella 0.9737094 267 267 ajatella 0.9851833 521 521 ajatella 0.8863296 37 37 ajatella 0.9731117 3013 3013 miettia 0.8588000 1704 1704 ajatella 0.9279253 474 474 pohtia 0.7424814 2711 2711 ajatella 0.9806257 323 323 ajatella 0.9683607 1300 1300 ajatella 0.9257161 2081 2081 ajatella 0.9534887 1765 1765 ajatella 0.9705500 2922 2922 ajatella 0.9906011 230 230 ajatella 0.8357151 52 pohtia 0.7062646 2611 2611 ajatella 0.9803866 2328 2328 ajatella 0.9295380 2163 2163 ajatella 1.0000000 763 harkita 0.5832702 2458 2458 ajatella 0.9517910 2362 2362 miettia 0.8384125 207 207 ajatella 0.8357440 1015 1015 ajatella 0.9886027 1759 1759 ajatella 0.8985800 88 ajatella 0.9688293 88 2369 2369 ajatella 0.9375479 479 479 ajatella 0.9368280 166 166 ajatella 0.6846686 2254 2254 ajatella 0.9328456 540 540 ajatella 0.8310588 894 ajatella 0.8172398 310 pohtia 0.4478400 894 pohtia 0.4478400 310 3278 3278 ajatella 0.9671088 3002 pohtia 0.6181336 3002 1943 miettia 0.7404593 1943 1754 1754 miettia 0.7539501 2168 2168 ajatella 0.9558096 133 133 ajatella 0.8449074 2680 2680 ajatella 0.9098211 2811 ajatella 0.9837570 2811

148 ajatella 0.6943053

148

```
1874
             1874 ajatella 0.9719171
             1613 ajatella 0.5357194
1613
2828
             2828 harkita 0.5458486
               180 ajatella 0.7531416
180
2585
             2585 ajatella 0.6915454
               695 pohtia 0.7891253
695
               194 ajatella 0.9866129
194
204
               204 ajatella 0.8225811
836
               836 pohtia 0.6927355
2069
             2069 ajatella 0.9731780
2122
             2122 ajatella 0.9290423
1619
             1619 miettia 0.8239539
907
               907 ajatella 0.9815937
1687
             1687 ajatella 0.8896726
313
               313 ajatella 0.9198923
560
               560 ajatella 0.8655428
1444
             1444 miettia 0.3592241
818
               818 ajatella 0.8619285
353
               353 ajatella 0.5544356
1009
             1009 ajatella 0.8867894
802
               802 miettia 0.6701509
362
               362 harkita 0.5212785
1161
             1161 ajatella 0.8555719
397
               397 ajatella 0.6337628
1997
             1997 ajatella 0.9591542
                        pohtia 0.3726344
2895
             2895
1261
             1261 ajatella 0.8920517
2722
             2722 ajatella 0.9472946
899
                                                                                                                LocationLocation; Modality2Temporal; MoodIndicati
286
                                                                                                                                 AgentGroup; Modality2Temporal; MoodIndi
514
                                                                                                                            AgentIndividual; MoodIndicative; PatientDi
                                                  AgentIndividual; CovertCovert; Modality1Necessity; MoodIndicative; PatientIndirectQue
1648
3233
                                AgentIndividual; CovertCovert; MannerAgreement; Modality1Possibility; MoodIndicative; Patientet
3035
                         AgentIndividual; CovertCovert; FrequencyFrequency; ModalitylNecessity; MoodIndicative; PatientInfin
2637
                                                                             AgentIndividual; CovertCovert; GoalGoal; Modality2Accidental; MoodInd
1171
                                                                                                                                                                                         MannerG
3162
                                                                                                       LocationLocation; Modality2Temporal; MoodIndicative; P.
1991
                                                                                                AgentGroup; MoodIndicative; NumberPlural; PatientIndirectQ
2422
                                                                                                         AgentIndividual; CovertCovert; MannerGeneric; MoodInd
                                                                                                                                                                              AgentIndividu
121
255
                                                                                                                                                                              ClauseEquival
2015
                                                                AgentIndividual; MannerAgreement; MetaCommentMetaComment; MoodIndicative; Num
                                                                                                                     AgentIndividual; MoodIndicative; Patientetta.C
2482
19
                                                                                                              AgentGroup; LocationLocation; MannerGeneric; MoodI
1387
                                                                                        AgentIndividual; LocationLocation; MannerPositive; MoodIndicati
76
                                                                                                                                                                         ClauseEquivalent
3112 AgentIndividual; CovertCovert; DurationDuration; MannerGeneric; Modality1Necessity; MoodIndicative; PersonThi
                                                                                                                                                              MannerAgreement; MoodI
1856
                                                                                                                    AgentIndividual; ClauseEquivalentClauseEquivale
1684
                                                                                                                       AgentIndividual; CovertCovert; NumberPlural;
574
1521
                                                                                                                           LocationLocation; MannerGeneric; MoodIndica
151
                                                                                               AgentIndividual: CovertCovert: MoodIndicative: PatientParti
558
                                                     AgentIndividual: CovertCovert: DurationDuration: MoodIndicative: PatientIndirectOue
1891
                                                                                                                MetaCommentMetaComment; MoodIndicative; PatientPa
267
                                                                                                       AgentIndividual: CovertCovert: MannerAgreement: MoodCo
521
                                                                                             {\tt AgentIndividual;\ CovertCovert;\ MoodIndicative;\ Patientetta.CovertCovert;\ MoodIndicative;\ Patientetta.CovertCovertCovert;\ MoodIndicative;\ Patientetta.CovertCovertCovertCovert;\ MoodIndicative;\ Patientetta.CovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCovertCov
                                                        AgentIndividual; MannerGeneric; MetaCommentMetaComment; MoodIndicative; NumberPlu
37
3013
                                                   AgentIndividual; CoordinatedVerbCoordinatedVerb; CovertCovert; FrequencyFrequency; P
1704
                                                  AgentIndividual; MetaCommentMetaComment; Modality2Accidental; MoodIndicative; NumberP
474
                                                                                                LocationLocation: MoodIndicative: PatientAbstraction: Reas
2711
                                                                                                                LocationLocation; MannerGeneric; MetaCommentMetaC
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2582

2211

482 1753

655

1579

2582

655

1579

pohtia 0.8507527

pohtia 0.6620441

2211 ajatella 0.8993147 482 ajatella 0.6688125

1753 ajatella 1.0000000 pohtia 0.8493617

1765	AgentIndividual; MannerGeneric; MoodInd
2922	AgentIndividual; MannerGeneric; MetaCommentMetaComment; ModalitylPossibility; MoodConditional; Patientet
230	AgentIndividual; ClauseEquivalent
52	LocationLocation; MetaCommentMetaComment; Modality2Temporal; MoodIndicative; PatientAc
2611	AgentIndividual; MannerGeneric; ModalitylPossibility; MoodIndicat:
2328	AgentIndividual; CovertCovert; Modality2Accidental; MoodIndicat:
2163	AgentIndividual; CovertCovert; MannerGeneric; MoodIndicat
763	AgentIndividual; ConditionCondition; CovertCovert; FrequencyFrequency; Modality1Necessity; MoodIndid
2458	AgentIndividual; MannerGeneric; M
2362	AgentIndividual; CoordinatedVerbCoordinatedVerb; CovertCovert; PatientIndirectQu
207	ClauseEquivalentClauseEquivalent;
1015	AgentIndividual; MannerGeneric; MoodIndicative; NumberP.
1759	AgentIndividual; CovertCovert; MannerNegative; Modality1Necessity; Modality2External; MoodIndicat:
88	AgentIndividual; MannerAgreement; Modality1Necessity; MoodCo
2369	ClauseEquivalentClauseEquivalent; Modality2Accidental
479	AgentIndividual; MetaCommentMetaComment; MoodIndicative; NumberPlural; PatientIndividual
166	AgentIndividual; Cover
2254	AgentIndividual; CovertCovert; MoodIndicative; PatientPa
540	ClauseEqu
894	AgentIndividual; MetaCommentMetaComment; MoodIndicative;
310	
3278	MannerNegative; MoodIndicative; Patientetta
3002	AgentIndividual; MetaCommentMetaComment; Modality2Temporal; MoodIndicative; NumberPlural; PatientAbst:
1943	AgentIndividual; CovertCovert; MoodIndicative; PatientIndivectQuestion; PersonThird; PolarityNegatic
1754	CoordinatedVerbCoordinatedVerb; MetaCommentMetaComment; ModalityNecessity; MoodIndicative; Pati
2168	AgentIndividual; CovertCovert; MannerGeneric; ModalityIPoss
133	
2680	AgentIndividual; CovertCovert; MoodIndicati
2811	AgentIndividual; CoordinatedVerbCoordinatedVerb; MoodIndicated
	MannerGeneric; MetaCommentMetaCom
148	
2582	AgentGroup; LocationLocation; Modality1Possibility; Modality2Temporal; MoodIndicative; Patien
2211	AgentIndividual; CovertCovert; MannerGeneric; Modality1Necessity; MoodIndicat:
482	AgentInd
1753	AgentIndividual; CovertCovert; MannerGeneric; MoodIndicat:
655	AgentGroup; LocationLocation; MoodIndicative; NumberPlu:
1579	AgentIndividual; LocationLocation; MoodIndicative; NumberPlural; I
1874	AgentIndividual; MannerGeneric; MetaCommentMeta
1613	AgentIndividual; Modality2Accidental; MoodIndicative; I
2828	AgentGroup; ClauseEquivalentClauseEquivalent; Patienti
180	
2585	AgentGroup; ClauseEquivalent(
695	LocationLocation; MoodIndicative; PatientAbs
194	ClauseEquivalentClauseEquiva
204	ClauseEquivalentClaus
836	
2069	AgentIndividual; MannerGeneric; MetaCommentMetaComment; MoodIndica
2122	MetaCommentMetaComment; ModalitylPossibility; MoodIndicative; Patientetta
1619	AgentIndividual; CovertCovert; PatientIndirectQuest
907	ClauseEquiva
1687	AgentIndividual; Modality2Accidental; MoodIndicative; PatientAct:
313	AgentIndividual; CovertCovert; GoalGoal; MetaCommentMetaComment; ModalitylPossibility; MoodIndicative;
560	MannerFrame; I
1444	ClauseEquivalent() l
818	AgentIndividual; MoodIndicative; PatientIn
353	Agentine
1009	AgentIndividual; CovertCovert; MoodIndicative; PatientIndividual
802	, 00.00.000,
362	AqentIndividual; ClauseEquivalentClauseEqui
1161	AgentIndividual; ClauseEquiva AgentIndividual; ClauseEquiva
397	Agentindividual, tiauseEquiva. ClauseEquiva.
1997	Ciausezquiva. GoalGoal; MoodIndicati
1991	Guardan; modinatet

AgentIndividual; CovertCovert; MannerAgreement; MetaCommentMetaC

AgentIndividual; CovertCovert; MoodIndicative; NumberPl CoordinatedVerbCoordinate

AgentIndividual; MannerGeneric; MoodIn

AgentIndividual; ClauseEquivalentClauseEquivalent;
AgentGroup; GoalGoal; Modality1Possibility; MoodIndicative;
AgentIndividual; ClauseEquivalentClauseEquivalent; Coordinated

 Even though one could select manually out of the results of the fitted polytomous logistic regression model those properties that together form the abstract prototypes per each outcome Lexeme, we can use the convenience function extra.prototypes to directly get these, sorted in terms of decreasing odds for each outcome.

# > extract.prototypes(think.polytomous) \$ajatella

Şajatella	
	Odds
MannerGenericTRUE	22.402327677
MannerAgreementTRUE	16.612737398
Modality2AccidentalTRUE	5.840152352
PatientParticipleTRUE	5.738414552
PatientInfinitiveTRUE	5.171373435
MannerNegativeTRUE	3.983843673
GoalGoalTRUE	3.611264449
SourceSourceTRUE	3.129202530
PatientIndividualGroupTRUE	2.747133577
Modality2ExternalTRUE	2.583958234
Patientetta.CLAUSETRUE	2.583353952
MannerFrameTRUE	2.577198926
(Intercept)	2.176841163
PolarityNegationTRUE	2.136006848
MoodIndicativeTRUE	1.992772273
TimeIndefiniteTRUE	0.577161840
${\tt Coordinated Verb Coordinated Verb TRUE}$	0.485562629
ConditionConditionTRUE	0.457020168
ReasonPurposeReasonPurposeTRUE	0.433650016
TimeDefiniteTRUE	0.403936351
FrequencyFrequencyTRUE	0.384048480
MannerJointTRUE	0.371588626
Modality1NecessityTRUE	0.345026528
Modality2TemporalTRUE	0.261189628
LocationLocationTRUE	0.258618962
PatientAbstractionTRUE	0.236903291
AgentGroupTRUE	0.195177806
PatientActivityTRUE	0.137437012
DurationDurationTRUE	0.118993611
PatientCommunicationTRUE	0.108109179
PatientIndirectQuestionTRUE	0.070908140
PatientDirectQuoteTRUE	0.009210107
\$harkita	
Od	dds

	ouus
PatientActivityTRUE	9.29309572
ConditionConditionTRUE	2.88457153
MoodConditionalTRUE	2.32344848
MannerPositiveTRUE	1.84576867
${\tt MetaCommentMetaCommentTRUE}$	1.62356351
LocationLocationTRUE	0.45796396
QuantityQuantityTRUE	0.33866227
MannerFrameTRUE	0.27702202
Patientetta.CLAUSETRUE	0.26164699
GoalGoalTRUE	0.21433596
Modality2TemporalTRUE	0.14768111
(Intercept)	0.06189904

### \$miettia

Amieccia	
	Odds
PatientIndirectQuestionTRUE	4.14463728
DurationDurationTRUE	3.41387969
PatientDirectQuoteTRUE	3.17224511
PatientCommunicationTRUE	2.68022996
QuantityQuantityTRUE	2.60735313
PersonSecondTRUE	2.36765400
CoordinatedVerbCoordinatedVerbTRUE	2.31432650
MannerJointTRUE	2.09148209
Modality1NecessityTRUE	2.02479917

Modality2TemporalTRUE	1.76610909
FrequencyFrequencyTRUE	1.76351066
PatientAbstractionTRUE	1.51096183
TimeIndefiniteTRUE	1.50815992
PolarityNegationTRUE	0.70499520
NumberPluralTRUE	0.59504069
${\tt Clause Equivalent Clause Equivalent TRUE}$	0.58219604
MoodConditionalTRUE	0.54458882
AgentGroupTRUE	0.51514830
Patientetta.CLAUSETRUE	0.50895779
PatientIndividualGroupTRUE	0.37043905
MannerFrameTRUE	0.27858938
(Intercept)	0.21650731
MannerGenericTRUE	0.14896994
MannerAgreementTRUE	0.07069893

### \$pohtia

	Odds
PatientDirectQuoteTRUE	8.7891740
PatientAbstractionTRUE	4.3827275
AgentGroupTRUE	4.1324530
LocationLocationTRUE	3.6754374
PatientCommunicationTRUE	3.0701864
${\tt PatientIndirectQuestionTRUE}$	2.8470324
Modality2TemporalTRUE	2.3534923
TimeDefiniteTRUE	2.2542571
VoicePassiveTRUE	1.8401364
PatientActivityTRUE	1.7441448
AgentIndividualTRUE	1.6646172
NumberPluralTRUE	1.5478831
Patientetta.CLAUSETRUE	0.5163393
PolarityNegationTRUE	0.4664671
PersonSecondTRUE	0.4054136
PatientIndividualGroupTRUE	0.3344601
SourceSourceTRUE	0.2869156
PersonFirstTRUE	0.2753850
MannerAgreementTRUE	0.2250194
MannerNegativeTRUE	0.2184115
(Intercept)	0.1240282