Supplementary Material for "Assigning Scores for Ordered Categorical Responses"

ARTICLE HISTORY
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Abstract
Deciding on the best statistical method to apply when the response variable is ordinal is essential because the way the categories are ordered in the data is relevant as it could change the results of the analysis. Although the models for continuous variables have similarities to those for ordinal variables, this paper presents the advantages of the use of the ordering information on the outcomes with methods developed for modeling ordinal data such as the ordered stereotype model. The novelty of this article lies in showing the dangers of assigning equally spaced scores to ordered response categories in statistical analysis, which are illustrated with a simulation study and a case study. We propose a new way to use the score parameters, which incorporates the fitted spacing dictated by the data. Additionally, this article uses score parameter estimates in the ordered stereotype model to propose a new measure to calculate continuous medians in the raw data: the *adjusted c-median*. It benefits the general audience who can easily understand the median as a summary statistic. Supplementary materials for this article are available online.

KEYWORDS
Global odds ratio; linear-by-linear association model; median measure; ordered stereotype model; uneven spacing

1. Floor and ceiling effects

We closely reproduce the "floor" and "ceiling" effects following [1, Section 1.3.1]. They generated two independent covariates from a continuous variable $x \sim \text{Uniform}(0, 100)$ and a binary variable $z \sim \text{Bernoulli}(0.5)$ for each of 100 subjects. Then, the latent response y^* was simulated according to a normal distribution with mean $E[Y^*] = 20 + 0.6x - 40z$ and standard deviation 10, for each subject. After that, this continuous response y^* was coded into five categories to create the ordinal response y as follows:

$$y = \begin{cases} 1 & \text{if } y^* \leq 20 \\ 2 & \text{if } 20 < y^* \leq 40 \\ 3 & \text{if } 40 < y^* \leq 60 \\ 4 & \text{if } 60 < y^* \leq 80 \\ 5 & \text{if } y^* > 80 \end{cases} \tag{1}$$

Figure 1 shows two scatter plots. The left scatterplot shows the data set of the continuous response y^* at given covariate x. It also depicts the fit of the linear regression model using ordinary least square method which estimates the model $E[Y^*] = \beta_0 + \beta_1 x + \beta_2 z$. On the other hand, the right scatterplot shows the 100 observations on the ordinal response y and x. We can observe a "floor effect" in this second plot for the observations

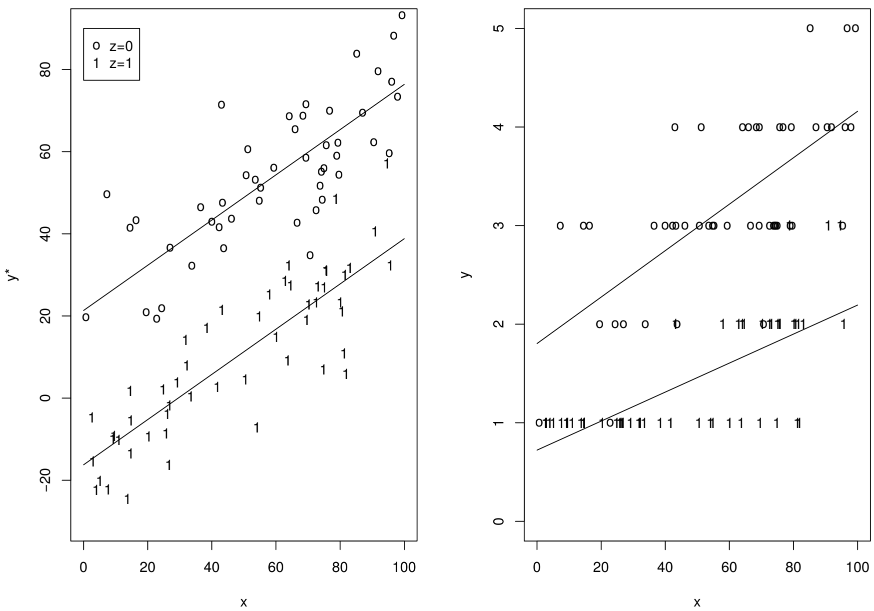

Figure 1.: **Floor effect:** The left scatterplot shows the data y^* generated from a normal main–effects regression model with covariates $x \sim \text{Uniform}(0, 100)$ and $z \sim \text{Bernoulli}(0.5)$. The right scatterplot shows the categorized ordinal response y following eq. (1). The ordinary regression in the ordered categorical data (right plot) suggests interaction effect, because of a "floor effect". The plots were reproduced from [1] with permission.

with $z = 1$ at low levels of x, i.e. the probability for an observation to be allocated in the lowest category of the ordinal variable Y is very high when $x < 50$ and $z = 1$. This second plot also depicts the fit of the linear regression model with an interaction term $E[Y] = \beta_0 + \beta_1 x + \beta_2 z + \beta_{12} xz$, which allows different slopes associating x to the mean of the ordinal variable $E[Y]$ at the two levels of z. The slope when $z = 1$ is half of the slope when $z = 0$. The underlying continuous variable Y^* gets lower when x gets lower. However, because the ordinal variable Y cannot get below the lowest category, it produces this interaction effect due to a "floor effect". [1] affirmed that standard ordinal models can fit the data without requiring for an interaction term. This advantage of ordinal regression models is also shown with real-data examples in sociology (see e.g. [3, Section 4] and [4]) and medicine [2].

2. Example: EPP Feedback

The paper-based and online-based English proficiency program data sets with the responses of 14 students over 85 questions giving feedback is given in Tables 1–4. The histogram of the online-based responses is given in Figure 2, which shows the granularity of the frequencies of the OB form responses. The online-based test seems not to be the continuous latent version of the paper-based test.

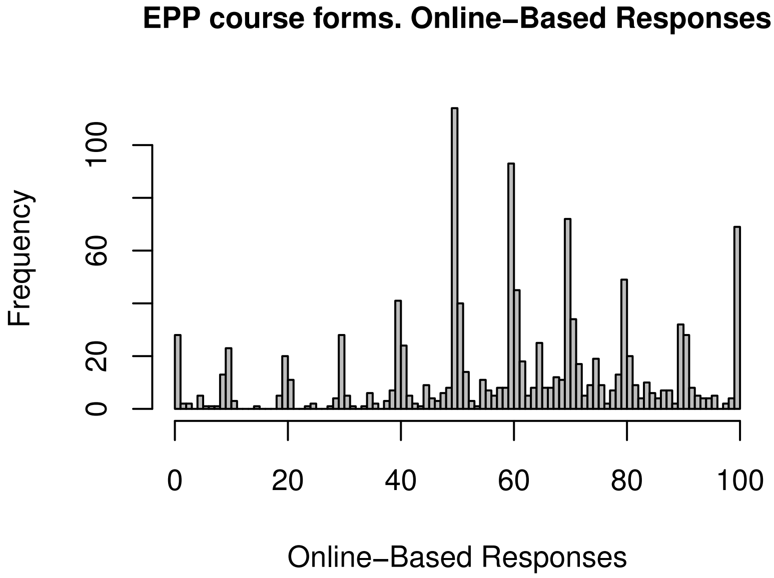

Figure 2.: Histogram of the English proficiency program responses for the online-based forms.

3. Results EPP students paper-based data set

Table 5 shows the computations of the median, c–median and adjusted c–median for each question in the EPP students paper-based data set.

4. Computation of the adjusted c–median

The R code for the computation of the adjusted c–median is as follows:

```
library("MASS")
library("KernSmooth")

# Function to compute F(x), given x and y=f(x)
area <- function(x,y){
a1 <- NULL
a1[1] <- 0
for(i in 1:(length(x)-1)){
     t <- (x[i+1]-x[i])*y[i]
     a1[i+1] <- a1[i]+t
}
a1
}

# English Proficency Program (EPP) data set (used in Section 4)
t1 <- y.paper
nrows <- dim(t1)[1]
```

```
ncols <- dim(t1)[2]


#Calculated the adjusted c--median
# try data with re-scaled scores, by assuming the new score be
(1, 4.279, 6.188, 6.858, 6.983, 6.998, 7).

t2 <- t1
dimnames(t2) <- dimnames(t1)
for (i in 1:nrows) for (j in 1:ncols)
{
if (t2[i,j] <- 2) (t2[i,j] <- 4.2790)
if (t2[i,j] <- 3) (t2[i,j] <- 6.1879)
if (t2[i,j] <- 4) (t2[i,j] <- 6.8584)
if (t2[i,j] <- 5) (t2[i,j] <- 6.9834)
if (t2[i,j] <- 6) (t2[i,j] <- 6.9982)
}

est.v.rows.adj <- apply(t2, MARGIN=1, bkde, bandwidth=0.5,gridsize=1000L)
est.v.cols.adj <- apply(t2, MARGIN=2, bkde, bandwidth=0.5,gridsize=1000L)

cmed.v.rows.adj <- array(NA,dim=nrows)
cmed.v.cols.adj <- array(NA,dim=ncols)
for (i in 1:nrows)
{
  area.rows <- area(est.v.rows.adj[[i]]$x,est.v.rows.adj[[i]]$y)
  cmed.v.rows.adj[i] <-
   est.v.rows.adj[[i]]$x[abs(area.rows-0.5)==min(abs(area.rows-0.5))]
}
for (i in 1:ncols)
{
  area.cols <- area(est.v.cols.adj[[i]]$x,est.v.cols.adj[[i]]$y)
  cmed.v.cols.adj[i] <-
   est.v.cols.adj[[i]]$x[abs(area.cols-0.5)==min(abs(area.cols-0.5))]
}

# Bar diagrams for showing the adjusted c--median

barplot(table(t2[,1]), space=diff.space, las=2,
        names.arg=round(as.numeric(names(table(t2[,1]))),3),
        cex.axis=1.2, cex.names=1.2, col="grey95")
title("Question 1. Adjusted c-median ", cex.main=1.4, cex.lab=1.2)
      #xlab="Adjusted ordinal categories", ylab="Frequencies")
abline(v = all.cols[1,3]+3.0, col = "black", lwd=7, lty="dotted")

barplot(table(t2[10,]), space=diff.space, las=2,
        names.arg=round(as.numeric(names(table(t2[10,]))),3),
        cex.axis=1.2, cex.names=1.2, col="grey95")
title("Student 10. Adjusted c-median ", cex.main=1.4, cex.lab=1.2)
      #xlab="Adjusted ordinal categories", ylab="Frequencies")
```

```
abline(v = all.rows[10,3]+3.25, col = "black", lwd=7, lty="dotted")
```

References

[1] A. Agresti, *Analysis of Ordinal Categorical Data*, 2nd ed., Wiley Series in Probability and Statistics, Wiley, Hoboken, New Jersey, 2010.

[2] T. Hastie, J. Botha, and C. Schnitzler, *Regression with an ordered categorical response*, Statistics in Medicine 8 (1989), pp. 785–794.

[3] R.D. McKelvey and W. Zavoina, *A statistical model for the analysis of ordinal level dependent variables*, Journal of mathematical sociology 4 (1975), pp. 103–120.

[4] C. Winship and R.D. Mare, *Regression models with ordinal variables*, American Sociological Review 49 (1984), pp. 512–525.

Table 1.: English proficiency program responses for the paper-based forms. 14 students (columns), 85 questions (rows) and 7 categories for each question (1/2).

Question	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**	**S10**	**S11**	**S12**	**S13**	**S14**
Q1	7	6	2	4	5	2	4	4	2	5	2	4	2	1
Q2	1	6	5	4	5	4	3	4	4	4	7	1	3	3
Q3	4	6	3	3	2	2	3	6	5	3	5	5	2	6
Q4	1	6	5	6	4	2	6	2	3	2	4	2	5	5
Q5	7	5	7	4	6	7	7	6	4	6	6	6	6	7
Q6	1	7	5	5	4	6	4	5	5	6	6	6	4	7
Q7	7	7	5	4	4	6	4	6	5	7	6	7	6	7
Q8	4	6	5	6	7	6	4	5	6	7	5	7	6	7
Q9	7	6	5	5	3	4	6	6	3	7	5	3	5	4
Q10	7	4	4	6	4	6	4	4	6	5	5	3	5	3
Q11	7	6	6	5	6	4	7	5	6	3	6	6	5	1
Q12	7	5	6	6	4	4	7	6	5	6	6	7	5	6
Q13	7	4	5	5	4	6	4	5	5	5	4	4	4	7
Q14	1	4	6	5	4	6	5	4	5	6	5	4	5	4
Q15	1	4	3	4	4	2	6	4	6	5	4	2	5	4
Q16	4	3	4	5	5	5	6	4	5	3	4	6	4	6
Q17	7	3	5	4	5	5	4	4	3	6	5	4	5	3
Q18	7	3	2	4	6	6	5	5	4	6	5	6	6	5
Q19	7	6	6	5	7	6	6	5	6	6	4	6	6	7
Q20	7	2	6	6	7	6	4	5	6	3	5	7	5	7
Q21	7	6	2	5	7	6	6	3	6	3	5	6	6	7
Q22	7	6	5	6	6	6	4	4	2	5	5	6	5	5
Q23	7	4	5	4	6	4	6	4	4	6	5	2	5	6
Q24	7	5	6	5	6	6	4	4	5	6	5	4	4	6
Q25	7	1	5	5	6	5	5	5	3	6	5	6	6	7
Q26	7	5	6	4	4	6	5	4	5	7	6	4	5	4
Q27	7	6	5	4	5	7	5	5	5	5	6	4	4	7
Q28	6	6	3	5	6	7	5	4	6	6	6	6	5	3
Q29	7	6	4	5	5	7	5	5	3	7	5	4	5	7
Q30	7	2	6	5	5	6	4	3	4	6	6	2	5	5
Q31	7	6	4	3	3	6	6	5	5	5	6	6	5	7
Q32	4	2	7	6	1	4	7	5	5	6	5	4	6	7
Q33	5	6	6	5	6	7	7	6	6	3	6	7	6	5
Q34	5	7	6	5	6	7	7	6	6	5	5	7	7	7
Q35	5	7	6	5	6	7	7	6	6	5	5	7	6	5
Q36	7	7	6	5	6	7	7	5	4	6	4	7	6	3
Q37	7	4	4	5	6	4	4	5	4	2	4	2	6	7
Q38	5	6	5	6	6	7	6	4	5	4	5	4	4	7
Q39	5	7	5	5	6	7	5	4	5	6	4	6	6	7
Q40	4	6	7	6	6	7	4	5	6	5	4	6	6	7
Q41	7	5	7	6	6	7	4	5	4	5	5	4	6	7
Q42	5	7	4	5	5	7	5	4	5	3	4	6	6	1
Q43	4	7	6	6	6	7	5	5	5	4	5	6	6	1

Table 2.: English proficiency program responses for the paper-based forms. 14 students (columns), 85 questions (rows) and 7 categories for each question (2/2).

Question	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**	**S10**	**S11**	**S12**	**S13**	**S14**
Q44	1	7	3	5	4	7	4	4	3	3	5	4	4	2
Q45	3	7	4	6	6	7	6	2	6	6	3	4	4	2
Q46	5	6	6	5	6	7	6	4	5	6	5	6	5	1
Q47	7	5	4	6	5	7	5	3	5	5	4	4	5	6
Q48	6	6	2	5	5	7	5	4	5	3	4	3	4	7
Q49	6	6	2	5	6	7	4	3	4	2	4	4	5	4
Q50	7	7	2	4	6	7	5	4	6	2	4	6	6	3
Q51	7	7	1	5	6	7	6	3	6	2	5	6	6	3
Q52	4	6	1	5	3	7	6	3	2	1	5	5	6	3
Q53	5	7	1	3	2	2	3	3	2	2	4	2	5	1
Q54	4	6	2	4	2	2	3	3	5	2	4	5	5	1
Q55	7	5	7	5	6	2	4	3	6	3	5	4	5	7
Q56	7	5	7	5	3	7	3	4	6	5	5	6	5	7
Q57	7	5	5	5	3	2	5	3	4	6	5	3	3	6
Q58	7	7	4	4	6	7	6	4	3	4	4	4	4	2
Q59	4	7	4	5	6	2	6	3	5	5	4	2	3	5
Q60	5	6	5	5	3	7	5	2	6	6	3	6	3	2
Q61	4	2	4	4	6	2	5	4	6	5	4	4	4	2
Q62	5	2	4	4	6	2	7	4	6	5	4	6	4	2
Q63	5	2	5	4	5	6	6	4	4	5	5	4	5	2
Q64	5	3	6	5	3	2	6	4	5	6	4	4	5	1
Q65	7	3	6	5	3	2	6	2	5	5	4	2	3	1
Q66	7	3	5	6	3	2	4	3	5	7	5	4	6	4
Q67	7	7	5	6	4	2	7	2	6	7	4	2	4	1
Q68	7	4	3	5	5	2	7	3	6	6	4	6	5	5
Q69	4	3	4	5	4	2	4	3	4	6	4	6	4	5
Q70	1	5	3	5	5	2	7	4	6	6	4	6	4	5
Q71	4	3	3	5	5	2	6	4	5	4	5	2	5	4
Q72	4	1	4	5	3	2	7	4	6	4	5	4	6	6
Q73	1	1	5	5	4	2	6	3	5	5	5	4	6	2
Q74	1	1	5	5	4	2	7	4	6	5	5	3	6	5
Q75	1	5	6	5	5	6	4	4	5	6	4	3	4	4
Q76	7	6	5	6	4	6	5	4	6	5	5	6	5	5
Q77	4	2	3	6	2	2	4	3	4	3	4	6	5	2
Q78	7	4	4	5	3	2	4	4	4	2	5	5	5	1
Q79	4	4	5	5	4	2	4	4	4	4	5	3	4	2
Q80	5	6	4	6	4	2	4	3	5	4	5	3	5	2
Q81	7	1	3	5	6	6	5	4	3	3	4	5	5	4
Q82	5	3	5	5	5	6	4	5	4	5	5	4	4	1
Q83	7	6	6	5	4	2	5	3	5	5	7	6	5	5
Q84	7	6	5	6	4	4	5	3	5	6	6	6	4	3
Q85	7	6	5	6	3	4	5	3	5	6	6	4	4	6

Table 3.: English proficiency program responses for the online-based forms. 14 students (columns), 85 questions (rows) and a continuous measure (from 0 to 100) for each question (1/2).

Question	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**	**S10**	**S11**	**S12**	**S13**	**S14**
Q1	82	80	19	60	50	10	50	40	35	60	5	51	70	0
Q2	0	86	35	51	50	10	40	50	40	62	55	21	50	0
Q3	91	86	40	74	20	10	50	80	35	76	65	50	51	100
Q4	0	100	61	78	50	10	50	40	55	84	50	10	50	81
Q5	100	69	90	62	81	90	50	80	40	57	55	71	60	81
Q6	3	69	40	58	61	9	50	61	50	67	65	62	60	91
Q7	100	69	50	50	40	90	60	70	60	91	65	81	60	61
Q8	81	67	70	84	100	100	60	60	60	56	65	80	71	92
Q9	100	75	75	67	31	70	60	90	60	56	65	40	60	30
Q10	100	41	21	84	51	80	50	50	65	79	75	51	79	31
Q11	83	80	81	84	100	65	60	80	70	68	70	80	70	0
Q12	100	85	71	94	60	75	70	70	50	58	80	80	61	31
Q13	38	64	71	66	61	76	70	50	60	87	30	50	51	100
Q14	3	35	60	67	0	90	70	50	60	85	60	41	60	41
Q15	5	49	20	80	61	71	50	60	60	77	55	41	50	19
Q16	6	69	40	67	61	20	60	50	60	64	55	51	61	72
Q17	100	57	50	76	60	80	60	50	65	62	40	30	70	61
Q18	40	74	11	74	100	90	0	70	70	66	65	81	70	92
Q19	52	96	82	46	100	90	50	50	70	55	45	79	60	100
Q20	100	100	80	32	100	90	50	50	70	36	45	70	49	90
Q21	48	100	39	45	100	90	60	59	70	51	35	69	29	100
Q22	81	0	60	61	20	66	70	50	60	52	65	80	39	72
Q23	100	63	7	69	61	80	50	50	65	73	50	51	60	72
Q24	100	68	61	71	71	100	50	51	70	72	40	50	61	40
Q25	100	100	40	82	61	90	50	60	70	78	40	52	60	100
Q26	100	58	71	84	40	100	50	51	70	100	50	52	61	10
Q27	100	94	71	89	40	75	60	50	70	90	30	52	50	81
Q28	51	85	30	78	69	86	50	50	70	55	40	61	61	51
Q29	96	73	70	94	62	66	50	61	65	59	30	51	51	71
Q30	79	60	80	78	60	28	50	51	65	65	40	70	60	52
Q31	92	87	60	80	62	65	50	51	70	61	40	71	80	100
Q32	49	57	91	93	10	91	70	62	70	87	55	51	91	91
Q33	50	100	50	88	91	100	70	92	80	44	50	81	90	71
Q34	93	100	50	76	90	100	70	79	80	47	50	81	60	100
Q35	63	84	70	74	0	100	70	92	75	45	50	82	70	41
Q36	50	88	82	82	92	95	70	69	70	57	50	51	70	62
Q37	88	64	81	96	91	90	60	70	60	42	50	50	81	100
Q38	94	100	70	92	91	100	60	56	70	65	50	41	50	100
Q39	93	100	90	71	90	100	60	41	75	64	50	51	61	100
Q40	50	100	61	95	90	81	60	50	80	68	50	60	61	100
Q41	93	80	71	90	90	91	60	70	65	79	50	51	59	100
Q42	49	100	20	75	90	91	60	41	80	82	50	72	51	0
Q43	39	100	30	90	91	91	61	49	80	81	80	72	61	0

Table 4.: English proficiency program responses for the online-based forms. 14 students (columns), 85 questions (rows) and a continuous measure (from 0 to 100) for each question (2/2).

Question	**S1**	**S2**	**S3**	**S4**	**S5**	**S6**	**S7**	**S8**	**S9**	**S10**	**S11**	**S12**	**S13**	**S14**
Q44	71	100	10	87	51	91	60	68	80	73	50	41	40	20
Q45	50	100	20	85	51	91	60	21	90	78	10	30	51	10
Q46	83	100	30	95	90	91	60	41	70	77	50	72	60	0
Q47	59	82	20	85	90	91	70	46	80	52	30	61	62	91
Q48	61	84	19	93	50	91	70	47	70	66	50	41	51	71
Q49	70	60	41	83	51	91	70	50	70	52	30	51	50	30
Q50	51	100	9	66	81	91	60	48	90	58	50	71	71	21
Q51	0	100	9	75	91	91	60	51	90	53	50	71	70	21
Q52	72	89	10	68	50	90	60	42	70	52	50	62	60	30
Q53	56	90	2	38	40	15	50	20	40	29	30	20	59	0
Q54	75	96	30	67	41	80	50	41	80	36	30	61	50	21
Q55	70	65	98	88	90	60	60	38	80	68	40	61	50	100
Q56	99	84	100	90	20	90	60	58	80	88	50	60	59	0
Q57	48	85	71	58	30	8	60	34	80	67	50	30	60	81
Q58	100	84	63	54	91	100	60	48	80	40	40	62	71	20
Q59	48	87	65	68	50	9	60	30	80	0	20	30	50	92
Q60	50	100	50	57	10	9	50	20	80	1	5	62	51	0
Q61	69	63	42	76	10	25	60	51	70	81	30	71	40	10
Q62	73	64	53	78	10	25	60	51	70	74	30	71	42	10
Q63	79	61	76	65	29	24	60	50	70	72	50	62	51	0
Q64	100	71	80	79	10	51	60	59	80	49	10	50	62	0
Q65	0	62	96	64	50	9	50	11	80	35	5	31	51	0
Q66	99	68	61	82	10	40	50	41	75	58	50	61	62	11
Q67	100	100	71	79	20	41	60	30	75	50	5	61	51	0
Q68	56	53	41	79	61	9	60	45	75	52	20	71	50	10
Q69	55	56	42	78	40	9	60	46	70	74	40	72	50	72
Q70	52	58	39	74	91	9	60	43	80	87	30	72	40	21
Q71	100	60	45	80	61	9	60	48	75	79	30	72	39	10
Q72	45	63	71	83	20	9	70	70	80	88	50	61	71	100
Q73	47	60	50	81	60	9	70	50	75	71	50	51	43	21
Q74	55	66	50	72	49	9	70	52	70	71	40	61	71	40
Q75	2	68	61	75	41	50	60	41	80	68	30	40	41	30
Q76	98	62	40	71	31	71	70	59	75	60	40	61	49	21
Q77	0	56	40	81	19	29	50	45	70	69	20	72	60	10
Q78	70	64	70	76	19	80	60	61	65	72	60	50	60	0
Q79	1	69	52	68	21	45	60	65	65	73	50	62	50	0
Q80	60	60	39	67	21	40	60	50	80	76	70	41	60	10
Q81	99	95	41	86	100	91	60	61	70	46	50	41	60	30
Q82	39	64	68	87	70	91	50	65	75	60	70	51	60	0
Q83	70	74	79	84	60	80	50	40	80	66	80	72	60	52
Q84	100	100	74	79	61	75	50	40	80	76	70	70	55	20
Q85	99	100	61	88	20	65	50	41	80	61	50	61	51	71

Table 5.: Median, c–median, and adjusted c–median for the 85 questions in the EPP students paper-based data set.

Quest.	median	c–median	adj. c–median	Quest.	median	c–median	adj. c–median
Q1	4	3.66	6.28	Q44	4	3.89	6.50
Q2	4	3.89	6.50	Q45	5	4.95	6.67
Q3	3.5	3.72	6.26	Q46	5.5	5.48	6.94
Q4	4	3.98	6.38	Q47	5	5.01	6.89
Q5	6	6.17	6.97	Q48	5	4.74	6.76
Q6	5	5.25	6.90	Q49	4	4.36	6.71
Q7	6	5.99	6.95	Q50	5.5	5.29	6.76
Q8	6	5.90	6.97	Q51	6	5.65	6.75
Q9	5	5.00	6.78	Q52	4.5	4.34	6.46
Q10	4.5	4.59	6.79	Q53	2.5	2.58	3.77
Q11	6	5.62	6.88	Q54	3.5	3.44	6.11
Q12	6	5.82	6.97	Q55	5	5.00	6.79
Q13	5	4.73	6.89	Q56	5	5.36	6.88
Q14	5	4.71	6.86	Q57	5	4.62	6.62
Q15	4	4.00	6.59	Q58	4	4.29	6.75
Q16	4.5	4.54	6.79	Q59	4.5	4.46	6.67
Q17	4.5	4.47	6.74	Q60	5.00	4.98	6.64
Q18	5	5.23	6.85	Q61	4	4.08	6.66
Q19	6	6.00	6.98	Q62	4	4.36	6.70
Q20	6	5.74	6.88	Q63	5	4.64	6.81
Q21	6	5.81	6.83	Q64	4.5	4.46	6.67
Q22	5	5.30	6.92	Q65	3.5	3.67	6.22
Q23	5	4.86	6.85	Q66	4.5	4.50	6.67
Q24	5	5.24	6.93	Q67	4.5	4.68	6.66
Q25	5	5.37	6.90	Q68	5	5.00	6.79
Q26	5	5.01	6.91	Q69	4	4.08	6.67
Q27	5	5.20	6.95	Q70	5	4.75	6.76
Q28	6	5.58	6.88	Q71	4	4.24	6.64
Q29	5	5.21	6.92	Q72	4	4.36	6.71
Q30	5	4.99	6.78	Q73	4.5	4.35	6.57
Q31	5.5	5.47	6.88	Q74	5	4.65	6.69
Q32	5	5.17	6.84	Q75	4.5	4.54	6.79
Q33	6	5.92	6.95	Q76	5	5.35	6.97
Q34	6	6.22	7.00	Q77	3.5	3.46	6.15
Q35	6	5.91	7.00	Q78	4	4.10	6.61
Q36	6	5.99	6.92	Q79	4	3.99	6.64
Q37	4	4.41	6.77	Q80	4	4.25	6.64
Q38	5	5.25	6.93	Q81	4.5	4.46	6.67
Q39	5.5	5.54	6.97	Q82	5	4.60	6.81
Q40	6	5.80	6.95	Q83	5	5.19	6.88
Q41	5.5	5.55	6.95	Q84	5.00	5.14	6.83
Q42	5	4.90	6.84	Q85	5	5.14	6.83
Q43	5.5	5.47	6.92				