

選舉民意調查資料分析報告

高嘉好、柯堯城、吳承恩、趙友誠

2024/10/6

目录

Brief introduction to the data	1
Preprocessing	2
Descriptive statistic	2
候選人3的知名度與支持度(分區、年齡層、性別): 後面三個還沒做	4
年齡分層	5
1. 分析所有候選人的知名度、支持度	
2. 請提供3號候選人的競選策略(需在何地、對何人進行拉票)	
3. 請建立3號候選人支持率的預測模式	

Brief introduction to the data

This is a complete data with no actual missing value while some might be labeled as missing. Dimension of the Data : 1671 samples × 15 columns

Variables	Explanation	remark
V1、V2、V3	District and Li	
V4_1~V4_8	Popularity	
V5	Support level	
V6	Age	1:20到29歲,2:30到39歲,3:40到49歲,4:50到59歲,5:60歲以上
V7	Education level	1:小學, 2:國中, 3:高中, 4:專科, 5:大學以上
V8	Sex	1:male, 2:female

Variables	Missing
V1	98,99
V2、V3	44,98,99
V4_1~V4_8	98,99
V5	98,99
V6	6,99
V7	95,99
V8	99

There is some potential encoding error which some value is coded into 91. We treat it as the same as 98,99.

```
library(haven)
library(Hmisc)
pollsav <- read_sav("poll.sav")
write.csv(pollsav, file = "poll.csv", row.names = FALSE)
pollcsv <- read.csv("poll.csv")
```

Preprocessing

First, we replace 44,91,95,98,99 by 0 and then converted variables from numeric format to factor one. As the graph shown below, there is no missing value in this data.

```
str(pollcsv)
pollcsv <- data.frame(
  t(apply(pollcsv, MARGIN = 1, FUN = function(row){
    row[row==99 | row==98 | row==91 | row==95 | row==44 | row[13]==6] <- 0
    return(row)
  })))
)
pollcsv[] <- lapply(pollcsv, function(item) return(as.factor(item)))
n <- dim(pollcsv)[1]
```

Descriptive statistic

This chunk is for the convenience of analysis, so it will not be shown here.

```
latex(describe(pollcsv, "Public Opinion"), file = "", size = "normalsize")
```

The definition of the popularity of a candidate in this analysis is the number of appearance of a candidate that a participant answered in the 4th question. And the definition of the support level of a candidate is the number of appearance of a candidate in 5th question divided by the number of the participants who specifically choose a name in 5th question. That is, participants who did not actually answered the question are removed from the calculation.

```
# 1~10
count4 <- unlist(lapply(factor(1:10), function(x){
  return(length(unlist(apply(pollcsv[,4:11], MARGIN = 1, function(row) if(x %in% row) return (TRUE))))
})))

# 1~10 5
count5 <- unlist(lapply(factor(0:10), function(x){
  return(sum(pollcsv$v5==x))
} ))

n_prime <- n-count5[1]

# = /sample size
p <- data.frame(factor(1:10), popularity=round(count4/n,3), count4)
```

Popularity				Support level		
	candidate	rate	count	candidate	rate	count
1	3	0.244	407	3	0.243	205
2	7	0.203	339	7	0.230	194
3	1	0.196	327	1	0.186	157
4	6	0.139	232	6	0.116	98
5	4	0.099	166	4	0.094	79
6	5	0.075	126	10	0.063	53
7	10	0.069	116	5	0.039	33
8	8	0.014	23	2	0.011	9
9	9	0.014	24	9	0.010	8
10	2	0.007	11	8	0.007	6

```
# = /(sample size- )
s <- data.frame(factor(1:10), `support level`=round(count5[2:11]/n_prime,3), count5[2:11])

#
p <- p[order(p$popularity, decreasing = TRUE ),]
s <- s[order(s$support.level, decreasing = TRUE ),]

latex(data.table::data.table(cbind(p,s)),title="",file = "", booktabs = TRUE, cgroup = c('Popularity'))
```

Then we calculate the popularity and the support level grouped by district.

```
# Dist1 Dist2
Dist1 <-subset(pollcsv,pollcsv$v1==1)
Dist2 <-subset(pollcsv,pollcsv$v1==2)
n1 <- dim(Dist1)[1]
n2 <- dim(Dist2)[1]

#
#
count4_1 <- unlist(lapply(factor(1:10), function(x){
  return(length(unlist(apply(Dist1[,4:11], MARGIN = 1, function(row) if(x %in% row) return (TRUE))))))
}))
# 5
count5_1 <- unlist(lapply(factor(0:10),function(x){
  return(sum(Dist1$v5==x))
} ))

n1_prime <- n1-count5_1[1]

# = /sample size
p_1 <- data.frame(factor(1:10), popularity=round(count4_1/n1,3), count4_1)

# = /(sample size- )
s_1 <- data.frame(factor(1:10), `support level`=round(count5_1[2:11]/n1_prime,3), count5_1[2:11])

#
p_1 <- p_1[order(p_1$popularity, decreasing = TRUE ),]
```

Popularity				Support level		
	candidate	rate	count	candidate	rate	count
1	3	0.293	317	3	0.297	163
2	7	0.228	247	7	0.259	142
3	6	0.180	195	6	0.151	83
4	1	0.160	173	1	0.100	55
5	4	0.098	106	4	0.058	32
6	5	0.089	96	10	0.055	30
7	10	0.064	69	5	0.053	29
8	8	0.014	15	2	0.013	7
9	9	0.013	14	9	0.007	4
10	2	0.006	7	8	0.005	3

```
s_1 <- s_1[order(s_1$support.level, decreasing = TRUE ),]

latex(data.table::data.table(cbind(p_1,s_1)),title="",file = "", booktabs = TRUE, cgroup = c('Popularity', 'Support level'))

#
#
count4_2 <- unlist(lapply(factor(1:10), function(x){
  return(length(unlist(apply(Dist2[,4:11], MARGIN = 1, function(row) if(x %in% row) return (TRUE))))))
}))

# 5
count5_2 <- unlist(lapply(factor(0:10),function(x){
  return(sum(Dist2$v5==x))
} ))

n2_prime <- n2-count5_2[1]

# = /sample size
p_2 <- data.frame(factor(1:10), popularity=round(count4_2/n2,3), count4_2)

# = /(sample size- )
s_2 <- data.frame(factor(1:10), `support level`=round(count5_2[2:11]/n2_prime,3), count5_2[2:11])

#
p_2 <- p_2[order(p_2$popularity, decreasing = TRUE ),]
s_2 <- s_2[order(s_2$support.level, decreasing = TRUE ),]

latex(data.table::data.table(cbind(p_2,s_2)),title="",file = "", booktabs = TRUE, cgroup = c('Popularity', 'Support level'))
```

候選人3的知名度與支持度(分區、年齡層、性別): 後面三個還沒做

```
#1 +2
p[1,2]
```

```
[1] 0.244
```

Popularity				Support level		
	candidate	rate	count	candidate	rate	count
1	1	0.282	154	1	0.347	102
2	7	0.168	92	7	0.177	52
3	3	0.165	90	4	0.160	47
4	4	0.110	60	3	0.143	42
5	10	0.086	47	10	0.078	23
6	6	0.068	37	6	0.051	15
7	5	0.055	30	5	0.014	4
8	9	0.018	10	9	0.014	4
9	8	0.015	8	8	0.010	3
10	2	0.007	4	2	0.007	2

```
s[1,2]
```

```
[1] 0.243
```

```
#1
p_1[1,2]
```

```
[1] 0.293
```

```
s_1[1,2]
```

```
[1] 0.297
```

```
#2
p_2[1,2]
```

```
[1] 0.282
```

```
s_2[1,2]
```

```
[1] 0.347
```

年齡分層

```
#
known3 <- apply(pollcsv[,4:11], 1, function(row){
  if("3" %in% row){
    return(1)
  }else{return(0)}
})
knownC3 <- data.frame(
  yes_no = known3,
  age = pollcsv$v6
)

#
```

```

poll3 <- unlist(lapply(pollcsv[,12], function(x){
  if(x=="3"){
    return(1)
  }else{return(0)}
}))
pollC3 <- data.frame(
  yes_no = poll3,
  age = pollcsv$v6
)
Age_Stratified <- data.frame(
  num_known = t(table(knownC3))[,2],
  num_support = t(table(pollC3))[,2],
  num_total = table(pollcsv$v6)
)
Age_Stratified[,3] <- NULL
Age_Stratified

```

	num_known	num_support	num_total	Freq
0	0	0	0	42
1	6	5	5	52
2	23	12	12	94
3	62	31	31	201
4	100	52	52	336
5	216	105	105	946

```

# v4_1~v4_10 3 True False
pollcsv$has_3 <- apply(pollcsv[, 4:11], 1, function(row) any(row == 3))
library(dplyr)

```

```
'dplyr'
```

```
'package:Hmisc':
```

```
src, summarize
```

```
'package:stats':
```

```
filter, lag
```

```
'package:base':
```

```
intersect, setdiff, setequal, union
```

```

library(ggplot2)
#
north_number<-pollcsv%>%
  count(v2)
north_number<-subset(north_number,v2!=0)

#
west_number<-pollcsv%>%
  count(v3)
west_number<-subset(west_number,v3!=0)

```

```

#
result1_3_2 <- pollcsv%>%
  filter(has_3 == TRUE)%>%
  count(v2)
result1_3_2 <- subset(result1_3_2, v2 != 0)

#
result1_3_3 <-pollcsv%>%
  filter(has_3==TRUE)%>%
  count(v3)
result1_3_3 <- subset(result1_3_3,v3!=0)

#
resultv5_v2 <-pollcsv%>%
  filter(v5 ==3)%>%
  count(v2)
resultv5_v2 <- subset(resultv5_v2,v2!=0)

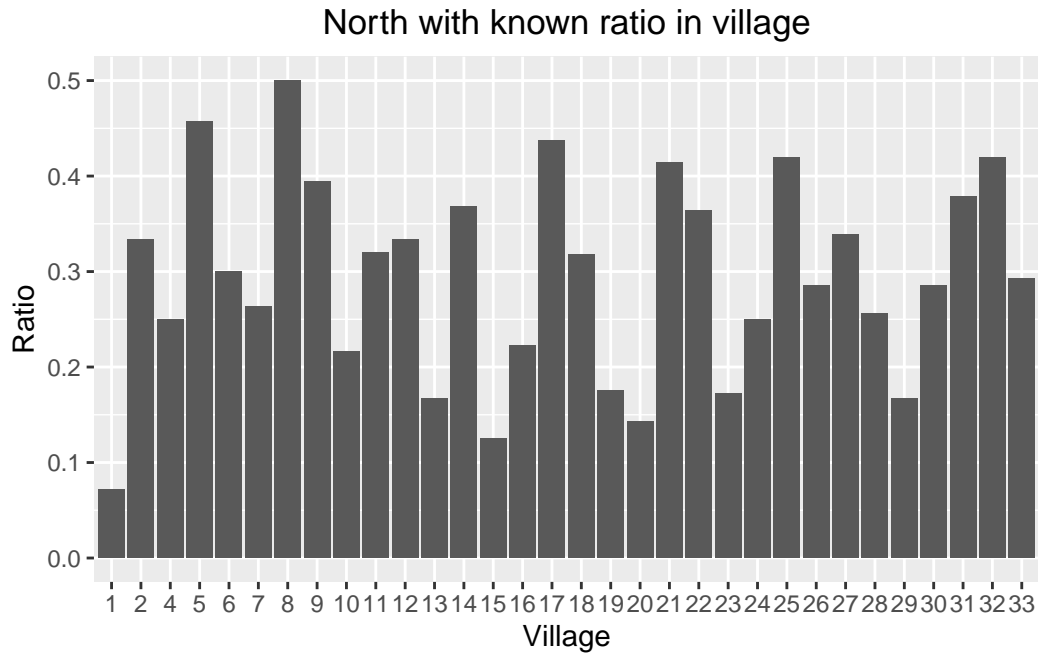
#
resultv5_v3 <-pollcsv%>%
  filter(v5 ==3)%>%
  count(v3)
resultv5_v3 <- subset(resultv5_v3,v3!=0)

#
merged_north <- merge(north_number, result1_3_2, by = "v2", suffixes = c("_north", "_known"))
merged_north <- merge(merged_north, resultv5_v2, by = 'v2')

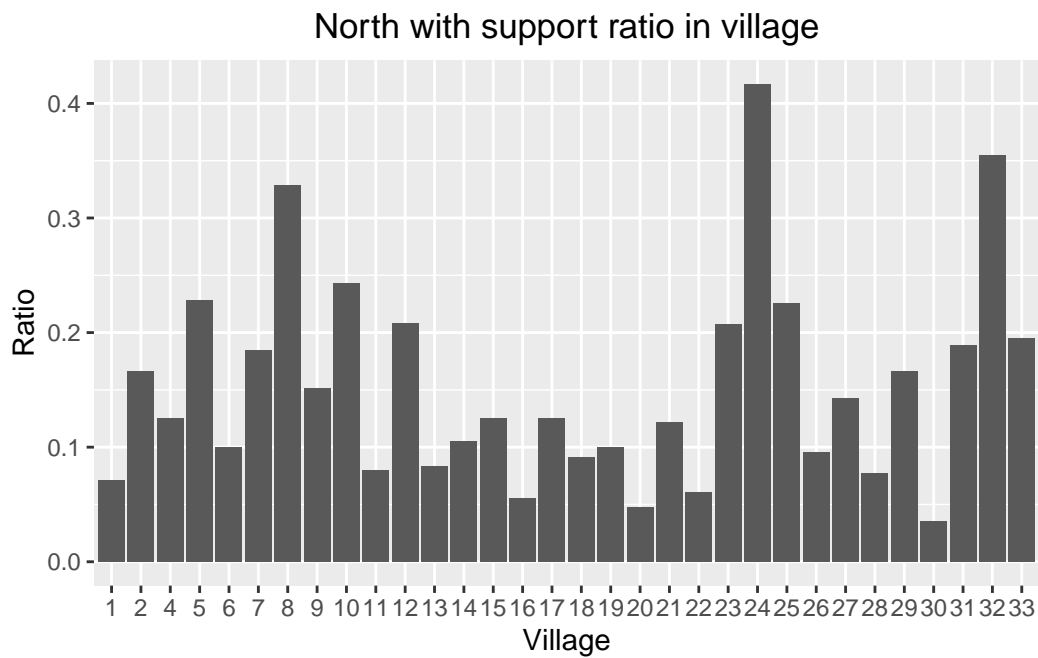
merged_north$ratio_known <- merged_north$n_known / merged_north$n_north
merged_north$ratio_support <- merged_north$n / merged_north$n_north

ggplot(merged_north, aes(x = v2, y = ratio_known))+
  geom_bar(stat = 'identity')+
  scale_x_discrete(breaks = 1:44)+
  labs(title = 'North with known ratio in village', x = 'Village', y = 'Ratio')+
  theme(plot.title = element_text(hjust = 0.5))

```



```
ggplot(merged_north, aes(x = v2, y = ratio_support))+
  geom_bar(stat = 'identity')+
  scale_x_discrete(breaks = 1:44)+
  labs(title = 'North with support ratio in village', x = 'Village', y = 'Ratio')+
  theme(plot.title = element_text(hjust = 0.5))
```



	VillageinMiddle west	Totalnumber	Known	Support	ratioknown	ratiosupport
1	1	17	2	1	0.1176470588235294	0.0588235294117647
2	10	15	4	1	0.2666666666666667	0.0666666666666667
3	11	9	2	2	0.2222222222222222	0.2222222222222222
4	12	29	6	2	0.2068965517241379	0.0689655172413793
5	13	34	7	1	0.2058823529411765	0.0294117647058824
6	14	17	2	1	0.1176470588235294	0.0588235294117647
7	16	18	2	1	0.1111111111111111	0.0555555555555556
8	17	43	11	8	0.2558139534883721	0.1860465116279070
9	18	20	5	1	0.2500000000000000	0.0500000000000000
10	19	34	6	5	0.1764705882352941	0.1470588235294118
11	2	25	8	1	0.3200000000000000	0.0400000000000000
12	4	51	4	5	0.0784313725490196	0.0980392156862745
13	5	42	8	4	0.1904761904761905	0.0952380952380952
14	7	14	3	2	0.2142857142857143	0.1428571428571428

```
#
merged_west <- merge(west_number, result1_3_3, by = "v3", suffixes = c("_west", "_known"))
merged_west <- merge(merged_west, resultv5_v3, by = 'v3')

merged_west$ratio_known <- merged_west$n_known / merged_west$n_west
merged_west$ratio_support <- merged_west$n / merged_west$n_west

# west_table
west_table<-merged_west%>%
  rename(
    'VillageinMiddle west'='v3',
    'Totalnumber'='n_west',
    'Known'='n_known',
    'Support'='n',
    'ratiosupport'="ratio_support",
    "ratioknown"="ratio_known"
  )
west_table$supportknown <-west_table$ratiosupport/west_table$ratioknown
latex(data.table::data.table(west_table),title="",file = "")

# north table
north_table<-merged_north%>%
  rename(
    'VillageinNorth'='v2',
    'Totalnumber'='n_north',
    'Known'='n_known',
    'Support'='n',
    'ratiosupport'="ratio_support",
    "ratioknown"="ratio_known"
  )
north_table$supportknown <-north_table$ratiosupport/north_table$ratioknown
latex(data.table::data.table(north_table),title="",file = "")
```

	VillageinNorth	Totalnumber	Known	Support	ratioknown	ratiosupport	s
1	1	14	1	1	0.0714285714285714	0.0714285714285714	1.00
2	10	37	8	9	0.2162162162162162	0.2432432432432433	1.12
3	11	25	8	2	0.3200000000000000	0.0800000000000000	0.25
4	12	24	8	5	0.3333333333333333	0.2083333333333333	0.62
5	13	12	2	1	0.1666666666666667	0.0833333333333333	0.50
6	14	19	7	2	0.3684210526315789	0.1052631578947368	0.28
7	15	32	4	4	0.1250000000000000	0.1250000000000000	1.00
8	16	18	4	1	0.2222222222222222	0.0555555555555556	0.25
9	17	16	7	2	0.4375000000000000	0.1250000000000000	0.28
10	18	22	7	2	0.3181818181818182	0.0909090909090909	0.28
11	19	40	7	4	0.1750000000000000	0.1000000000000000	0.57
12	2	12	4	2	0.3333333333333333	0.1666666666666667	0.50
13	20	21	3	1	0.1428571428571428	0.0476190476190476	0.33
14	21	41	17	5	0.4146341463414634	0.1219512195121951	0.29
15	22	33	12	2	0.3636363636363636	0.0606060606060606	0.16
16	23	29	5	6	0.1724137931034483	0.2068965517241379	1.20
17	24	12	3	5	0.2500000000000000	0.4166666666666667	1.66
18	25	31	13	7	0.4193548387096774	0.2258064516129032	0.53
19	26	42	12	4	0.2857142857142857	0.0952380952380952	0.33
20	27	56	19	8	0.3392857142857143	0.1428571428571428	0.42
21	28	39	10	3	0.2564102564102564	0.0769230769230769	0.30
22	29	12	2	2	0.1666666666666667	0.1666666666666667	1.00
23	30	28	8	1	0.2857142857142857	0.0357142857142857	0.12
24	31	37	14	7	0.3783783783783784	0.1891891891891892	0.50
25	32	31	13	11	0.4193548387096774	0.3548387096774194	0.84
26	33	41	12	8	0.2926829268292683	0.1951219512195122	0.66
27	4	8	2	1	0.2500000000000000	0.1250000000000000	0.50
28	5	35	16	8	0.4571428571428571	0.2285714285714286	0.50
29	6	10	3	1	0.3000000000000000	0.1000000000000000	0.33
30	7	38	10	7	0.2631578947368421	0.1842105263157895	0.70
31	8	70	35	23	0.5000000000000000	0.3285714285714286	0.65
32	9	33	13	5	0.3939393939393939	0.1515151515151515	0.38

```

sex1 <-subset(pollcsv,pollcsv$v8==1)#
sex2 <-subset(pollcsv,pollcsv$v8==2)#
n3 <- dim(sex1)[1]
n4 <- dim(sex2)[1]

#
count4_sex1 <- unlist(lapply(factor(1:10), function(x){
  return(length(unlist(apply(sex1[,4:11], MARGIN = 1, function(row) if(x %in% row) return (TRUE))))))
}))

count5_sex1 <- unlist(lapply(factor(0:10),function(x){
  return(sum(sex1$v5==x))
} ))

n3_prime <- n3-count5_sex1[1]

# = /sample size
p_sex1 <- data.frame(factor(1:10), popularity=round(count4_sex1/n3,3), count4_sex1)

# = /(sample size- )
s_sex1 <- data.frame(factor(1:10), `support level`=round(count5_sex1[2:11]/n3_prime,3), count5_sex1[2:11])

#
#
count4_sex2 <- unlist(lapply(factor(1:10), function(x){
  return(length(unlist(apply(sex2[,4:11], MARGIN = 1, function(row) if(x %in% row) return (TRUE))))))
}))

# 5
count5_sex2 <- unlist(lapply(factor(0:10),function(x){
  return(sum(sex2$v5==x))
} ))

n4_prime <- n4-count5_sex2[1]

# = /sample size
p_sex2 <- data.frame(factor(1:10), popularity=round(count4_sex2/n4,3), count4_sex2)

# = /(sample size- )
s_sex2 <- data.frame(factor(1:10), `support level`=round(count5_sex2[2:11]/n4_prime,3), count5_sex2[2:11])

data1=data.frame(
  sex=c('male','female'),
  total = c(n3,n4),
  popularity_count=c(count4_sex1[3],count4_sex2[3]),
  popularity_ratio=c(round(count4_sex1[3]/n3,2),round(count4_sex2[3]/n4,2)),
  support_count=c(count5_sex1[4],count5_sex2[4]),
  support_ratio=c(round(count5_sex1[4]/n3,2),round(count5_sex2[4]/n4,2)),
  change_ratio=c(round(count5_sex1[4]/count4_sex1[3],2),round(count5_sex2[4]/count4_sex2[3],2))
)
latex(data1,title="",file = "", booktabs = TRUE,colheads = c('sex','total','popularitycount','popularityratio'))

```

	sex	total	popularitycount	popularityratio	supportcount	supportratio	changeratio
1	male	668	190	0.28	88	0.13	0.46
2	female	961	217	0.23	117	0.12	0.54

可以發現3號候選人在男性選民中的知名度是大於女性選民的，但男性選民的支持度卻小於女性選民，在所有認識3號候選人

```
pollcsv$support <- ifelse(pollcsv$v5==3,1,0)
pollcsv$known3 <- known3
str(pollcsv)
```

```
'data.frame': 1671 obs. of 18 variables:
 $ v1      : Factor w/ 3 levels "0","1","2": 3 3 3 2 2 3 2 3 3 2 ...
 $ v2      : Factor w/ 34 levels "0","1","2","3",...: 1 1 1 10 8 1 11 1 1 10 ...
 $ v3      : Factor w/ 21 levels "0","1","2","3",...: 6 12 6 1 1 1 1 2 1 1 ...
 $ v4_1    : Factor w/ 11 levels "0","1","2","3",...: 1 2 5 4 1 1 1 1 4 1 ...
 $ v4_2    : Factor w/ 10 levels "0","2","3","4",...: 1 4 1 10 1 1 1 1 1 1 ...
 $ v4_3    : Factor w/ 9 levels "0","3","4","5",...: 1 6 1 1 1 1 1 1 1 ...
 $ v4_4    : Factor w/ 8 levels "0","4","5","6",...: 1 8 1 1 1 1 1 1 1 ...
 $ v4_5    : Factor w/ 7 levels "0","5","6","7",...: 1 1 1 1 1 1 1 1 1 ...
 $ v4_6    : Factor w/ 6 levels "0","6","7","8",...: 1 1 1 1 1 1 1 1 1 ...
 $ v4_7    : Factor w/ 5 levels "0","7","8","9",...: 1 1 1 1 1 1 1 1 1 ...
 $ v4_8    : Factor w/ 3 levels "0","8","10": 1 1 1 1 1 1 1 1 1 ...
 $ v5      : Factor w/ 11 levels "0","1","2","3",...: 1 8 7 8 1 11 8 1 8 1 ...
 $ v6      : Factor w/ 6 levels "0","1","2","3",...: 6 6 6 6 6 6 6 6 4 ...
 $ v7      : Factor w/ 6 levels "0","1","2","3",...: 2 3 6 3 3 4 3 6 2 4 ...
 $ v8      : Factor w/ 3 levels "0","1","2": 3 2 3 3 3 2 3 2 3 ...
 $ has_3   : logi FALSE FALSE FALSE TRUE FALSE FALSE ...
 $ support : num 0 0 0 0 0 0 0 0 0 0 ...
 $ known3  : num 0 0 0 1 0 0 0 0 1 0 ...
```

```
fit <-glm(factor(support)~v2+v3+v6+v7+v8+factor(known3),family=binomial(),data=pollcsv)
```

Warning: glm.fit:

```
summary(fit)
```

Call:

```
glm(formula = factor(support) ~ v2 + v3 + v6 + v7 + v8 + factor(known3),
     family = binomial(), data = pollcsv)
```

Coefficients: (1 not defined because of singularities)

	Estimate	Std. Error	z value	Pr(> z)
(Intercept)	-18.56607	1006.46498	-0.018	0.985282
v21	0.13733	1.08008	0.127	0.898822
v22	0.79648	0.85201	0.935	0.349877
v23	-16.17730	2923.75999	-0.006	0.995585
v24	0.20236	1.15317	0.175	0.860701
v25	0.68072	0.49586	1.373	0.169807
v26	-0.16827	1.12807	-0.149	0.881426
v27	0.73596	0.51150	1.439	0.150200
v28	1.25253	0.37229	3.364	0.000767 ***
v29	0.25140	0.56917	0.442	0.658707

v210	1.15133	0.47851	2.406	0.016126	*
v211	-0.37614	0.80319	-0.468	0.639569	
v212	0.86504	0.59432	1.456	0.145526	
v213	0.12480	1.09644	0.114	0.909382	
v214	-0.02020	0.81096	-0.025	0.980125	
v215	0.71051	0.61034	1.164	0.244375	
v216	-0.59547	1.07894	-0.552	0.581013	
v217	0.24108	0.83235	0.290	0.772098	
v218	-0.28030	0.81492	-0.344	0.730882	
v219	0.24807	0.59983	0.414	0.679189	
v220	-0.48621	1.06709	-0.456	0.648646	
v221	-0.03627	0.55491	-0.065	0.947882	
v222	-0.75026	0.79056	-0.949	0.342608	
v223	1.20219	0.54108	2.222	0.026295	*
v224	2.14807	0.67122	3.200	0.001373	**
v225	0.77727	0.52491	1.481	0.138671	
v226	-0.11306	0.60354	-0.187	0.851408	
v227	0.28912	0.47362	0.610	0.541564	
v228	-0.30123	0.66974	-0.450	0.652878	
v229	0.93850	0.83471	1.124	0.260870	
v230	-1.10747	1.06776	-1.037	0.299650	
v231	0.65613	0.50787	1.292	0.196387	
v232	1.52893	0.47687	3.206	0.001345	**
v233	0.78576	0.48547	1.619	0.105545	
v31	-0.14641	1.08687	-0.135	0.892843	
v32	-0.94791	1.06703	-0.888	0.374343	
v33	0.37687	1.07681	0.350	0.726346	
v34	0.40139	0.54552	0.736	0.461853	
v35	0.15777	0.59613	0.265	0.791275	
v36	-16.25771	1362.98504	-0.012	0.990483	
v37	0.61872	0.84243	0.734	0.462679	
v38	-16.21903	1272.60229	-0.013	0.989831	
v39	-15.65403	2243.23018	-0.007	0.994432	
v310	-0.38779	1.08567	-0.357	0.720948	
v311	1.07494	0.88046	1.221	0.222132	
v312	-0.15421	0.78732	-0.196	0.844720	
v313	-1.21641	1.05761	-1.150	0.250083	
v314	-0.26620	1.07922	-0.247	0.805172	
v315	-16.09552	2535.82274	-0.006	0.994936	
v316	-0.25436	1.08256	-0.235	0.814236	
v317	0.79196	0.48584	1.630	0.103086	
v318	-0.77208	1.07747	-0.717	0.473643	
v319	0.67185	0.56159	1.196	0.231561	
v320	-15.92459	1685.78447	-0.009	0.992463	
v61	0.12498	1545.42903	0.000	0.999935	
v62	0.11523	1545.42899	0.000	0.999941	
v63	0.22121	1545.42896	0.000	0.999886	
v64	0.10044	1545.42896	0.000	0.999948	
v65	-0.06362	1545.42895	0.000	0.999967	
v71	15.58387	1172.76549	0.013	0.989398	
v72	16.04095	1172.76549	0.014	0.989087	
v73	15.86977	1172.76548	0.014	0.989203	
v74	16.04636	1172.76549	0.014	0.989083	
v75	15.44313	1172.76548	0.013	0.989494	

```

v81          -0.08516    0.17045   -0.500  0.617319
v82              NA         NA       NA       NA
factor(known3)1  1.55358    0.17129    9.070   < 2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

```

(Dispersion parameter for binomial family taken to be 1)

```

Null deviance: 1244.0  on 1670  degrees of freedom
Residual deviance: 1027.2  on 1605  degrees of freedom
AIC: 1159.2

```

Number of Fisher Scoring iterations: 17

```

#
support3toedulevel <- pollcsv[pollcsv$v5 == 3,"v7"]
summary(support3toedulevel)

```

```

0  1  2  3  4  5
0 27 26 64 31 57

```

```

plot(support3toedulevel,
     type = "h",
     main = "      ",
     xlab = "  ",
     ylab = "  ",
     )

```

Warning in plot.window(xlim, ylim, log = log, ...): "type"

Warning in axis(if (horiz) 2 else 1, at = at.l, labels = names.arg, lty = axis.lty, : "type"

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...): "type"

```

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e6>
dot

```

```

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <94>
dot

```

```

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <af>
dot

```

```

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e6>
dot

```

```

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <8c>
dot

```

```

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <81>

```

```

dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e4>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <b8>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <89>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e8>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <99>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <9f>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e5>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <80>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <99>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e9>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <81>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <b8>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e4>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <ba>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <ba>
dot

```

```

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e4>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <b8>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <ad>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e6>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <95>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <99>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e8>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <82>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <b2>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e7>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <a8>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <8b>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e5>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <ba>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <a6>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e8>

```



```

dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <88>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <87>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e4>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <ba>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <ba>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e6>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <95>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <b8>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e9>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <97>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <9c>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e4>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <bf>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <82>
dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e6> dot

```

```

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <95> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <99> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <e8> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <82> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <b2> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <e7> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <a8> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <8b> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <e5> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <ba> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <a6> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <e4> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <ba> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <ba> dot

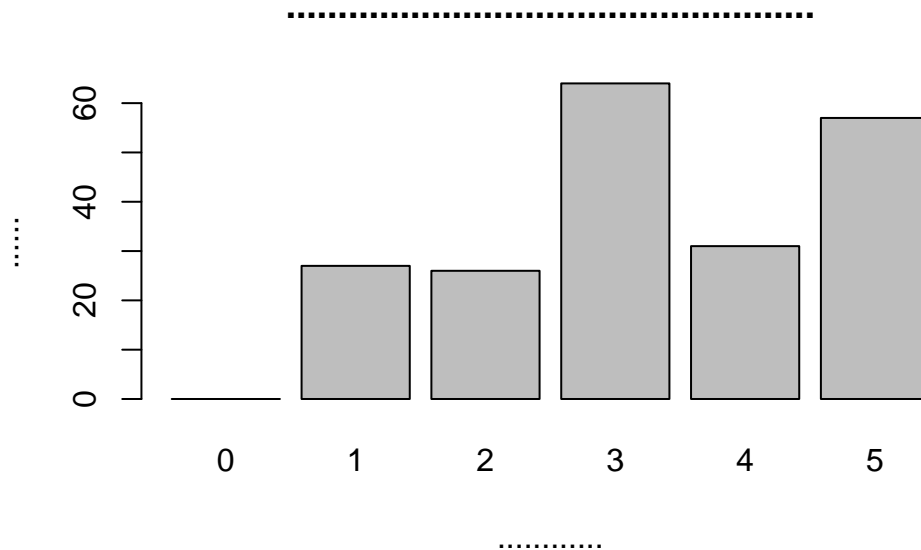
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <e6> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <95> dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <b8> dot

Warning in axis(if (horiz) 1 else 2, cex.axis = cex.axis, ...):      "type"

```



```
#
known3toedulevel <- apply(pollcsv[,4:11],1,function(row)any(row==3))
k32edu <- pollcsv[known3toedulevel,14]
summary(k32edu)
```

```
0  1  2  3  4  5
1 51 40 121 53 141
```

```
plot(k32edu,
     main = "      ",
     xlab = "  ",
     ylab = " ")
```

```
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e7>
```

```
dot
```

```
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <9f>
```

```
dot
```

```
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <a5>
```

```
dot
```

```
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e9>
```

```
dot
```

```
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <81>
```

```
dot
```

```

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <93>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e4>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <b8>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <89>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e8>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <99>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <9f>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e5>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <80>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <99>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e9>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <81>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <b8>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e4>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <ba>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):

```

```

'mbcsToSbcs'      '      '      <ba>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e4>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <b8>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <ad>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e6>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <95>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <99>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e8>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <82>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <b2>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e7>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <a8>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <8b>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e5>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <ba>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <a6>
dot

```

```

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e8>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <88>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <87>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e4>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <ba>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <ba>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e6>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <95>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <b8>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e9>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <97>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <9c>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <e4>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <bf>
dot

Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      '      '      <82>
dot

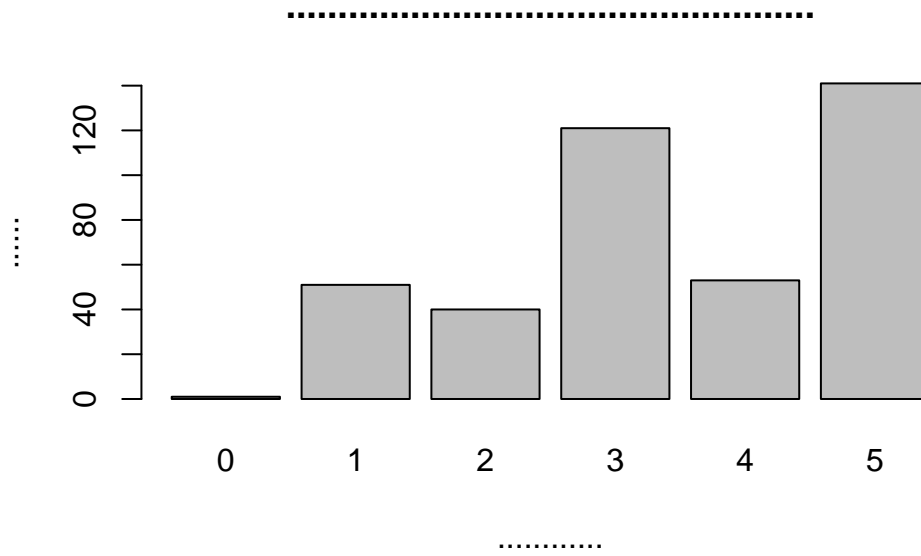
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):

```

```

'mbcsToSbcs'      ' '      <e6>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <95>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <99>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <e8>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <82>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <b2>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <e7>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <a8>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <8b>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <e5>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <ba>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <a6>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <e4>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <ba>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <ba>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <e6>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <95>  dot
Warning in title(main = main, sub = sub, xlab = xlab, ylab = ylab, ...):
'mbcsToSbcs'      ' '      <b8>  dot

```



3() 5()