An Investigation of Children's Development of Fairness

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Study Design

Children are collected from a variety of sources (museums, children's events, etc)

Experiment is conducted in 3 stages

- ❏ Warm-up and scale introduction
- ❏ Act evaluation (16 randomized images)
- ❏ Forced choice classification

Plan to introduce **harm** as a new factor

The Data (Original Study)

Tips for reading it in:

Many online converters from .sav to .csv exist but some will change variable values and toss out metadata. R has a couple of useful libraries to get around this.

- read.spss() in package “foreign”
- read_sav() in package “haven”

The Data (Original Study)

Numeric: Age (in years and months)
Ordinal: Card Responses
Categorical: StudyID, Gender, Forced Choice(s) Results
Other: Averaged Card Responses

AgeinMonths	Gender	MoralHit	MoralPush	MoralPullHair	MoralTear
72.7	1	9	9	9	
74.9	1	9	9	9	
74.8	1	6	6	4	
82.5	1	9	9	9	
73.8	1	9	6	9	

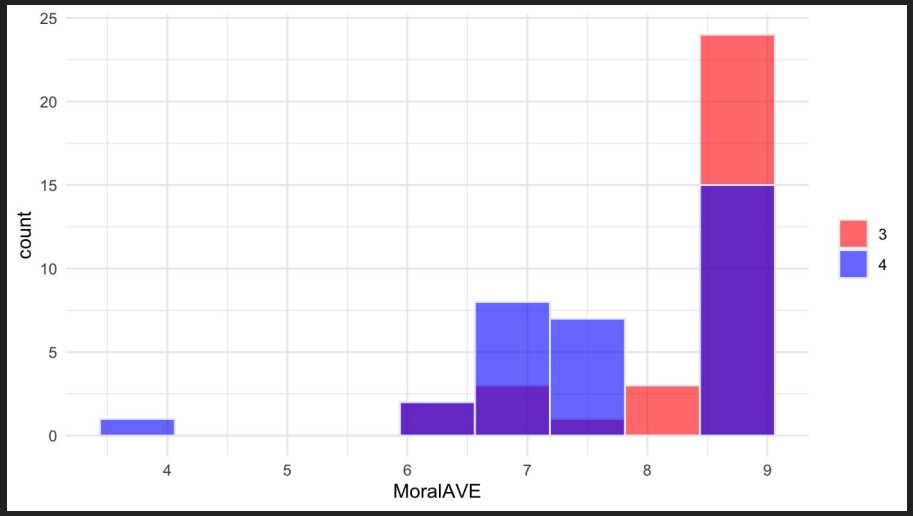
Summary Statistics

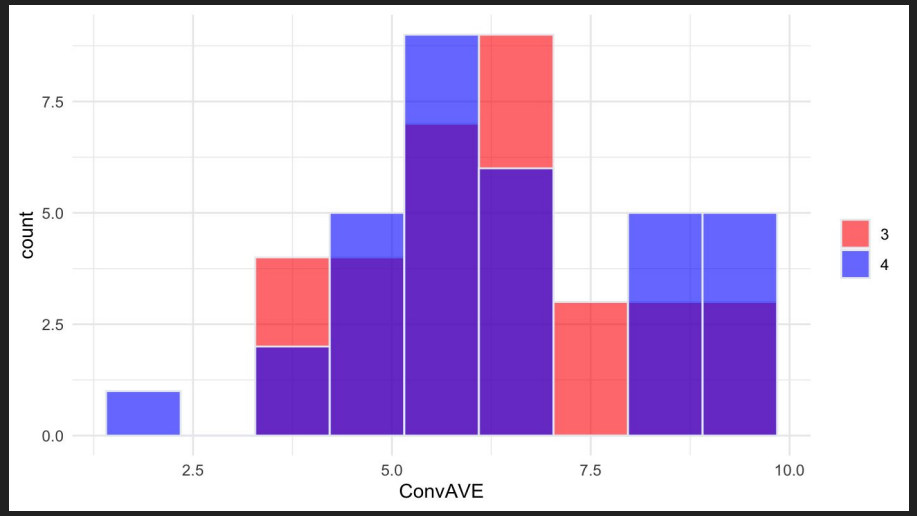
	MoralAVE	FairAVE	ConvAVE	ControlAVE
nbr.val	33.0000000	33.0000000	33.0000000	33.00000000
nbr.null	0.0000000	0.0000000	0.0000000	0.00000000
nbr.na	0.0000000	0.0000000	0.0000000	0.00000000
min	6.0000000	4.5000000	3.5000000	1.00000000
max	9.0000000	9.0000000	9.0000000	3.25000000
range	3.0000000	4.5000000	5.5000000	2.25000000
sum	280.0000000	243.5000000	205.7500000	44.50000000
median	9.0000000	7.7500000	6.2500000	1.00000000
mean	8.4848485	7.3787879	6.2348485	1.34848485
SE.mean	0.1561323	0.2437964	0.2717655	0.09543275
CI.mean.0.95	0.3180311	0.4965971	0.5535681	0.19439015
var	0.8044508	1.9614110	2.4372633	0.30054451
std.dev	0.8969118	1.4005038	1.5611737	0.54821940
coef.var	0.1057075	0.1898013	0.2503948	0.40654472

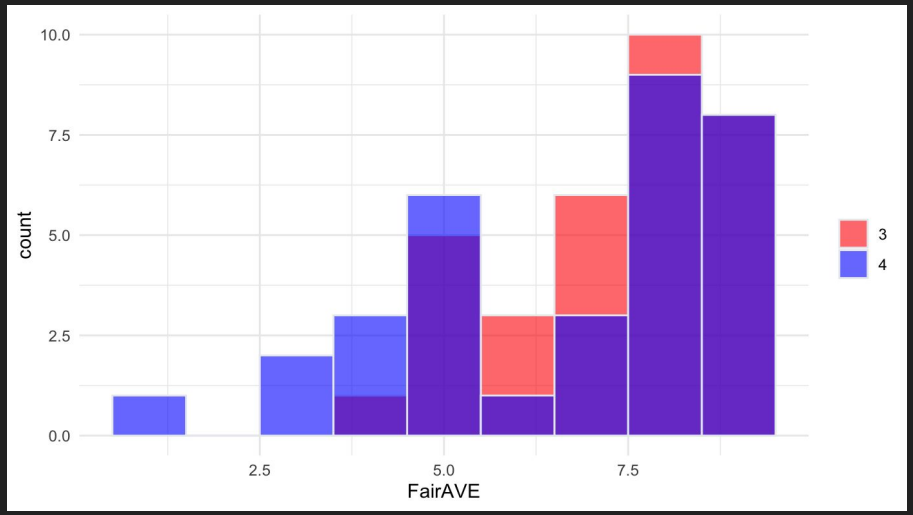
6 Years

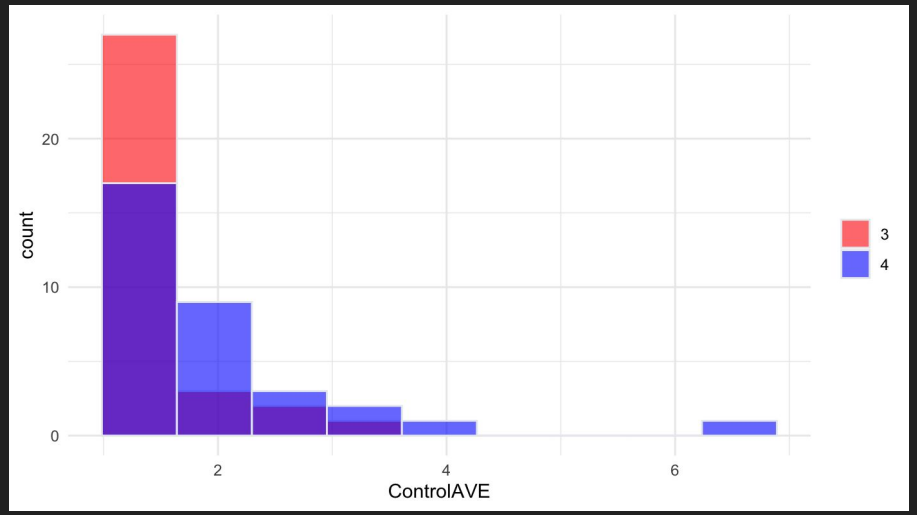
	MoralAVE	FairAVE	ConvAVE	ControlAVE
nbr.val	33.0000000	33.0000000	33.0000000	33.0000000
nbr.null	0.0000000	0.0000000	0.0000000	0.0000000
nbr.na	0.0000000	0.0000000	0.0000000	0.0000000
min	4.0000000	1.0000000	1.5000000	1.0000000
max	9.0000000	9.0000000	9.0000000	6.2500000
range	5.0000000	8.0000000	7.5000000	5.2500000
sum	257.2500000	221.2500000	207.0000000	59.7500000
median	7.7500000	7.7500000	5.7500000	1.2500000
mean	7.7954545	6.7045455	6.2727273	1.8106061
SE.mean	0.2074188	0.3752295	0.3284497	0.1949378
CI.mean.0.95	0.4224983	0.7643175	0.6690302	0.3970753
var	1.4197443	4.6463068	3.5600142	1.2540246
std.dev	1.1915302	2.1555294	1.8868000	1.1198324
coef.var	0.1528494	0.3215027	0.3007942	0.6184848

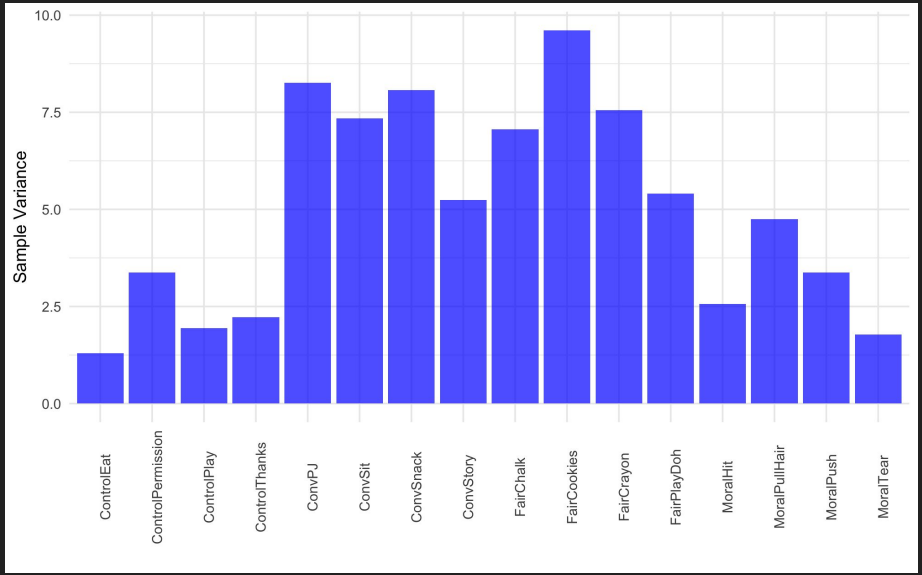
3-4 Years

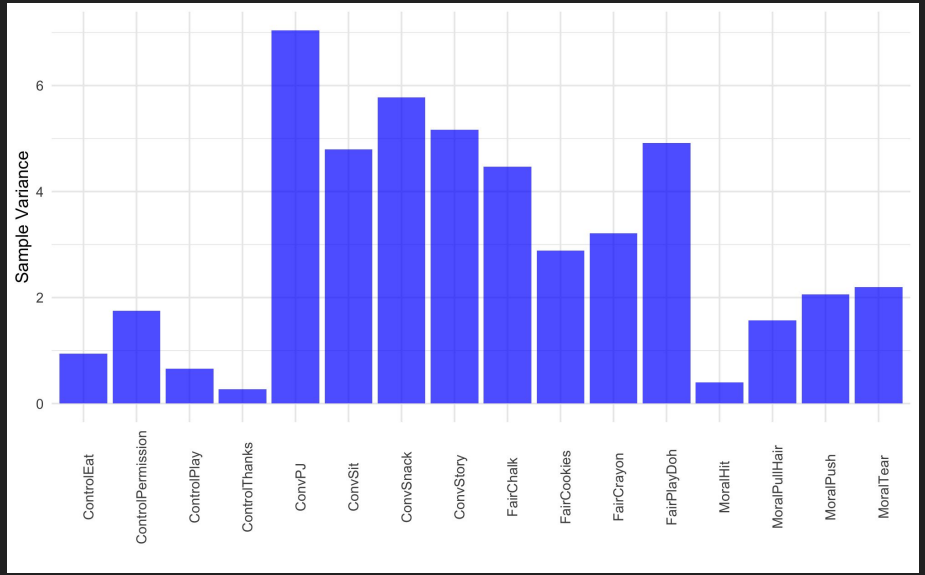

count
MoralAVE
3
4

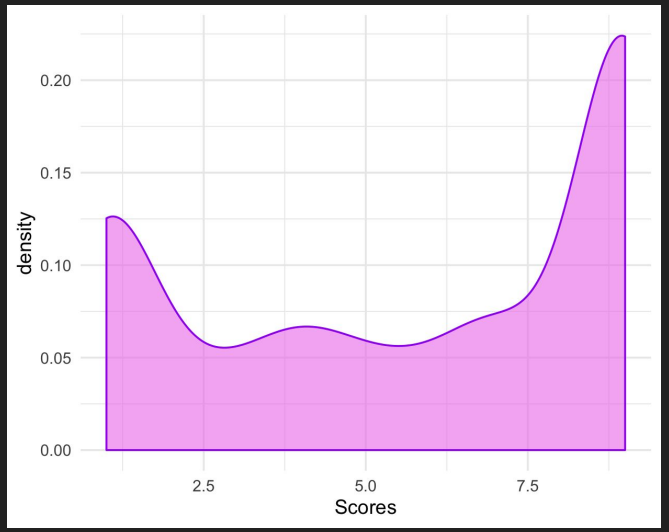

count
ConvAVE
3
4

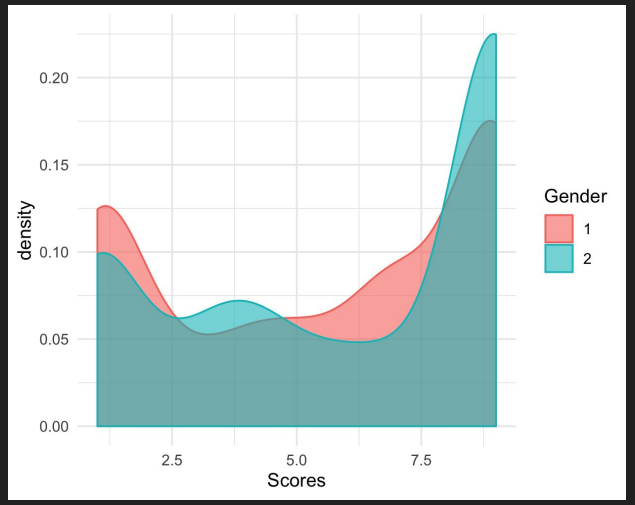

count
FairAVE
3
4

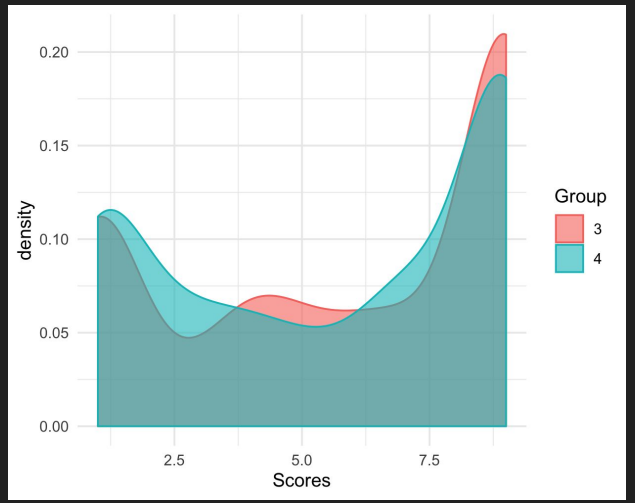

count
ControlAVE
3
4

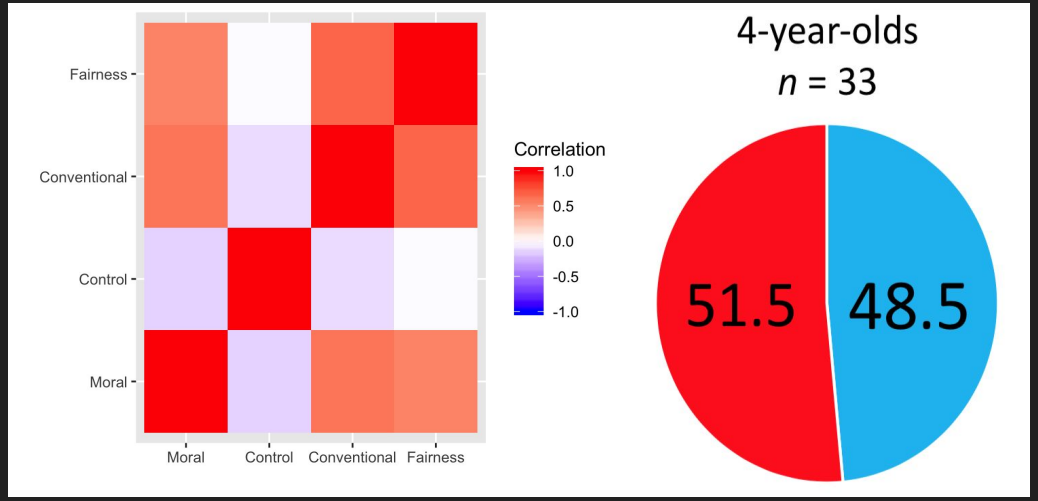

Sample Variance
10.0
7.5
5.0
2.5
0.0
ControlEat
ControlPermission
ControlPlay
ControlThanks
ConvPJ
ConvSit
ConvSnack
ConvStory
FairChalk
FairCookies
FairCrayon
FairPlayDoh
MoralHit
MoralPullHair
MoralPush
MoralTear

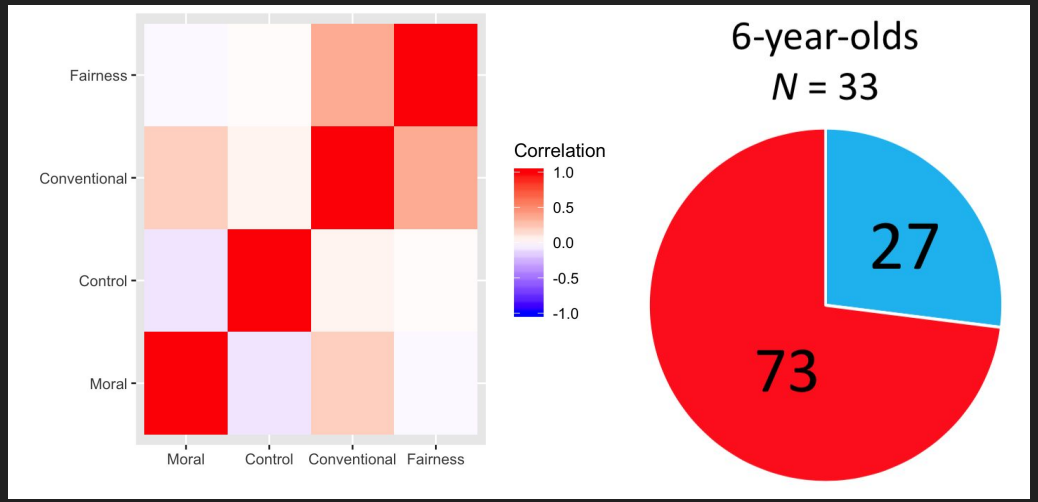

Sample Variance
6
4
2
0
ControlEat
ControlPermission
ControlPlay
ControlThanks
ConvPJ
ConvSit
ConvSnack
ConvStory
FairChalk
FairCookies
FairCrayon
FairPlayDoh
MoralHit
MoralPullHair
MoralPush
MoralTear


density
0.20
0.15
0.10
0.05
0.00
2.5
5.0
7.5
Scores


density
0.20
0.15
0.10
0.05
0.00
2.5
5.0
7.5
Scores
Gender
1
2

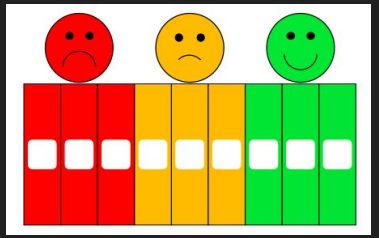

density
0.20
0.15
0.10
0.05
0.00
2.5
5.0
7.5
Scores
Group
3
4


Fairness
Conventional
Control
Moral
Moral
Control
Conventional
Fairness
Correlation
1.0
0.5
0.0
-0.5
-1.0
4-year-olds
n = 33
51.5
48.5


Fairness
Conventional
Control
Moral
Moral
Control
Conventional
Fairness
Correlation
1.0
0.5
0.0
-0.5
-1.0
6-year-olds
N = 33
27
73

Discussion

- Main Questions
  - What is the sample size necessary for the study?
    - The equation associated with the sample size is:
    - $$n = \frac{2(Z_\alpha + Z_{1-\beta})^2 \sigma^2}{D^2}$$
  - What is the analysis plan?



- Things to Consider
  - Is the likert scale a reliable measure? (Should it be treated linearly)
  - Is the linear mixed effects model the best model, or are there other ways to analyze the difference between harm vs. no harm?
    - “Multilevel” models are used to model data with hierarchical groups that might be dependent (longitudinal data)
  - Potential new experimental designs?

Groups

Group 1	Group 2	Group 3	Group 4
Haoyu Wang Leo Jiahui Liao Adam Simon Sophie Youk	Jeff Niznik Madeline McCombe Cameron Rangecroft Oliver Knocklein	Yanxi Lu Max Zhai Hongxuan Lou Andrew Shao	Yubo Jiang Ken Brunson Yuqi Lin Lai Zhao
Group 5	**Group 6**	**Group 7**	**Group 8**
Shawn Anand Bo Li Shenghao Ye Yameng Zhang	Zheng Chen Shuxuan Huang Shulei Yang Xu Zhu	Yisha He Yingyu Cheng Luoyu Liang Xingchen Zhou	Haotian Jiang Jingze Diao Shijie Xiu Zeren Miao Haoran Zhu

Our Approach

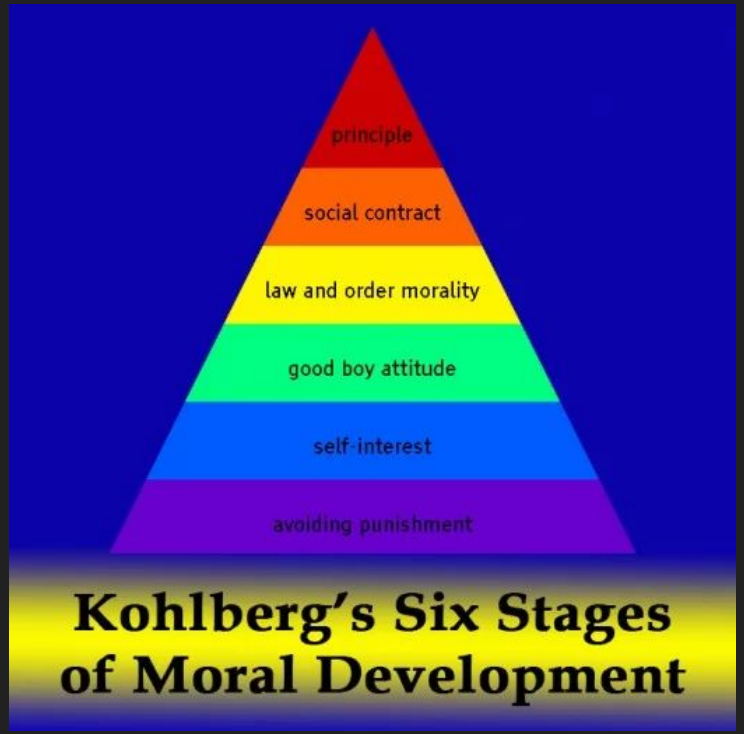
- What is the sample size necessary for the study?
  - Significance level
  - Difference
  - Standard deviation
  - Calculate sample size n
- What is the sample size necessary for the study?
  - Bootstrapping
  - Nested ANOVA
  - If start out a new study?

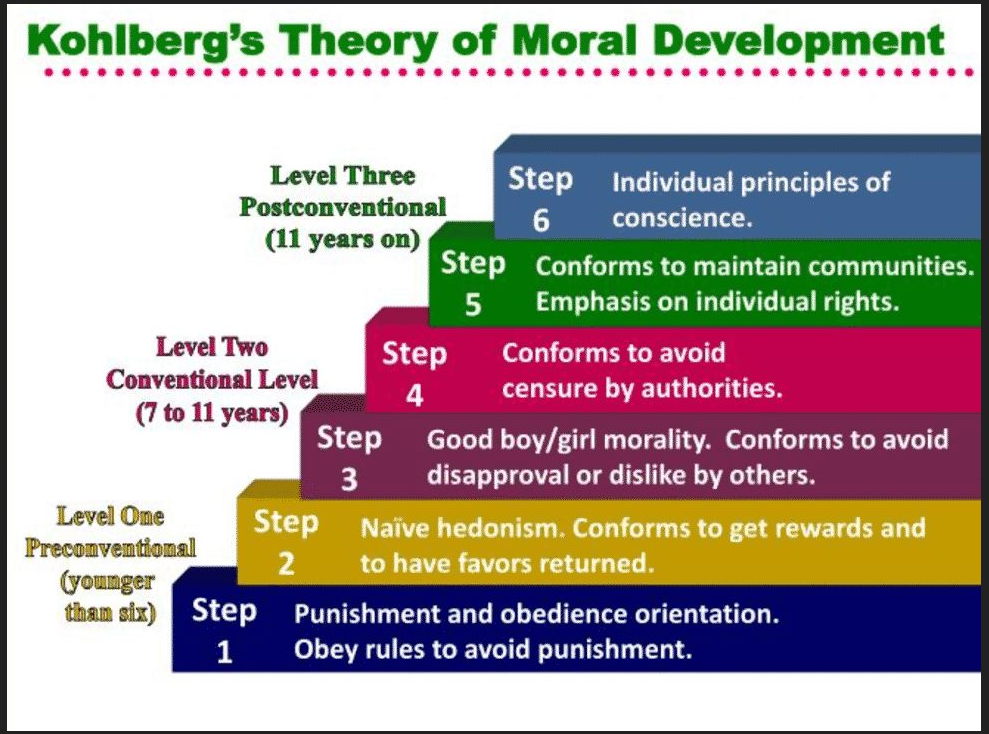
$$n = \frac{2(Z_\alpha + Z_{1-\beta})^2 \sigma^2}{D^2}$$

Further Considerations

- Likert scale problems?
- Comprehensibility of the cards?
- Reasoning behind the classification task?
- Kohlberg?

Kohlberg, 1984





Thank you