PSY2014 - Kvantitativ metode

Skriftlig skoleeksamen onsdag 23. mai, 09:00 (3 timer).

Kalkulator uten grafisk display og tekstlagringsfunksjon er tillatt. En liste av relevante formler og en tabell av t-fordelingen er gitt på slutten av oppgaven. Forsøk å besvare alle oppgavene.

Tegne på papir:
Du mulighet til å levere digital håndtegning. Du bruker skisseark du får utdelt. Det er anledning til å bruke flere ark per oppgave.
Du må bruke **blå** eller **svart penn**.
Se instruksjon for utfylling av skisseark på pult.
Det blir IKKE gitt ekstratid for å fylle ut informasjonsboksene på skisseark (engangskoder, kand.nr. o.l.).

1 Oppgave 1: Sjenerthet hos barn (55%)

I denne oppgaven skal vi se på ulike forklaringsvariabler for sjenerthet hos barn. Du finner SPSS-utskrift fra fire regresjonsmodeller i det vedlagte pdf-dokumentet.

SJENERT: Høyere skåre indikerer mer selvrapportert sjenerthet. Dette vil være den avhengige variabelen i alle analysene i denne oppgaven.

Følgende uavhengige variabler vil bli brukt i regresjonsanalysene:
SØSKEN: Antall søsken barnet har.
KJØNN: Jenter kodet 0, gutter kodet 1.
ALDER: Barnets alder i år.
IQ: En skåre på intelligens.
HØYDE: Barnets høyde i cm.
FØDSELSVEKT: Barnets fødselsvekt i gram.
TILKNYTNING: Høyere skåre indikerer økt grad av sikker tilknytning til foreldre.

a) Både lineær regresjon og Pearson korrelasjon kan brukes til å kaste lys på sammenhengen mellom variabler. Diskuter kort forskjeller og likheter mellom hva du kan lære om sammenhengen mellom variabler gjennom korrelasjon og multippel regresjon.

b) I modell 1 er SØSKEN den eneste uavhengige variabelen i modellen.

1. Hvordan vil du oppsummere sammenhengen mellom SJENERT og SØSKEN på bakgrunn av modell 1?
2. Hva er den forventede skåren på sjenerthet for et barn som har 2 søsken?

Skriv ditt svar her...

Format

Words: 0

Maks poeng: 10

Knytte håndtegninger til denne oppgaven?
Bruk følgende kode:

X X X X X X X

2 c) I modell 2 blir de uavhengige variablene KJØNN og ALDER lagt til.

1. Forklar kort hva vi mener med en *konfunderende variabel* (confounder), og hvorfor multippel regresjon kan være til hjelp i situasjoner med konfunderende variabler.
2. Er det grunn til å tro at en av variablene KJØNN og/eller ALDER konfunderer forholdet mellom SØSKEN og SJENERTHET?

d) I modell 3 blir de uavhengige variablene IQ og HØYDE lagt til.

1. Vis at R^2 (R square) for modell 3 er 0.123.
2. Hvordan vil du forklare endringene i R^2 og justert R^2 fra modell 2 til modell 3?

Skriv ditt svar her...

Format | B I U x_2 x^2 | I_x | | | | Ω | | | Σ | ABC | |

Words: 0

Maks poeng: 10

Knytte håndtegninger til denne oppgaven?
Bruk følgende kode:

X X X X X X X

3 e) I modell 4 blir de uavhengige variablene FØDSELSVEKT og TILKNYTNING lagt til.

1. Hvordan vil du gå frem for å vurdere hvilken av variablene FØDSELSVEKT og TILKNYTNING som er *sterkest* assosiert med sjenerthet? (Begrunn svaret)
2. Hvilke partielle regresjonskoeffisienter i modell 4 er statistisk signifikant på et 0.05 nivå?

f) Vi må gjøre flere antagelser for at resultatene fra en lineær regresjonsanalyse skal være valide. I det vedlagte pdf-dokumentet finner du figurer av residualene for tre modeller der en viktig antagelse er blitt brutt. Forklar kort hvilken antagelse som har blitt brutt i hver av modellene.

Skriv ditt svar her...

Format | B I U x_2 x^2 | I_x | | | | Ω | | | Σ | ABC | |

Words: 0

Maks poeng: 10

Knytte håndtegninger til denne oppgaven?
Bruk følgende kode:

X X X X X X X

4 **Oppgave 2: Hukommelse for drømmer; Effekten av stress og alder (25%)**

En forsker er interessert i om hvor godt man husker sine drømmer henger sammen med alder og stress, og 60 deltagere blir rekruttert til en studie for å vurdere dette. Deltagerne hadde opplevde enten; 1: Ingen stress, 2: Arbeidsrelatert stress (stor arbeidsbelastning), eller 3: Emosjonell stress (samlivsproblemer).
Videre var halvparten av deltagerne under 40 år (1: yngre), mens den andre halvparten var over 50 (2: eldre).

a) Først ble det gjennomført en enveis variansanalyse av hukommelse for drømmer over faktoren stress. Du finner SPSS-utskriften fra modell 1 øverst i det vedlagte PDF-dokumentet.

1. Angi hvilke tall som er sladdet i tabellen.
2. Hva ville du konkludert med vedrørende forholdet mellom stress og hukommelse for drømmer?

Skriv ditt svar her...

Format | B I U x_2 x^2 I_x | Ω | ∑ | ABC

Words: 0

Maks poeng: 10

Knytte håndtegninger til denne oppgaven?
Bruk følgende kode:

X X X X X X X

5 b) I neste omgang ble det gjennomført en toveis variansanalyse med faktorene stress og alder. Du finner resultatene i det vedlagte PDF-dokumentet.

1. Forklar med egne ord hva vi mener med en *interaksjonseffekt*.
2. Hvordan ville du oppsummere resultatene fra toveis variansanalysen?

Skriv ditt svar her...

Format

Words: 0

Maks poeng: 10

Knytte håndtegninger til denne oppgaven?
Bruk følgende kode:

X X X X X X X

6 Oppgave 3: Sammenhengen mellom kjæledyr og favoritt filmsjanger (20%)

I denne oppgaven skal vi se på om folks foretrukne filmsjanger (komedie, thriller, drama) henger sammen med typen kjæledyr de har (katt, hund, hamster).

1. Er lineær regresjon egnet for å studere sammenhengen mellom disse variablene? (Begrunn svaret)
2. Vi sier at «samplingfordelingen til kji-kvadrat statistikken følger en kji-kvadrat fordeling under H0». Forklar med egne ord hva vi mener med dette.
3. Hva ville du konkludert med vedrørende forholdet mellom kjæledyr og foretrukket filmsjanger ut ifra den vedlagte SPSS-utskriften?

Skriv ditt svar her...

Format

Words: 0

Maks poeng: 10

Knytte håndtegninger til denne oppgaven?
Bruk følgende kode:

X X X X X X X

Question 1
Attached

Correlations

		SJENERT	SØSKEN	KJØNN	ALDER	IQ	HØYDE	FØDSELSVEKT	TILKNYTNING
SJENERT	Pearson Correlation	1	-,185**	,052	-,338**	,004	,045	-,202**	-,118*
	Sig. (2-tailed)		,001	,372	,000	,951	,440	,000	,040
	N	300	300	300	300	300	300	300	300
SØSKEN	Pearson Correlation	-,185**	1	,026	,346**	,094	-,013	,105	,112
	Sig. (2-tailed)	,001		,653	,000	,106	,819	,069	,053
	N	300	300	300	300	300	300	300	300
KJØNN	Pearson Correlation	,052	,026	1	,005	-,018	,013	-,063	,038
	Sig. (2-tailed)	,372	,653		,928	,755	,818	,279	,514
	N	300	300	300	300	300	300	300	300
ALDER	Pearson Correlation	-,338**	,346**	,005	1	-,017	-,073	,059	-,048
	Sig. (2-tailed)	,000	,000	,928		,766	,208	,308	,407
	N	300	300	300	300	300	300	300	300
IQ	Pearson Correlation	,004	,094	-,018	-,017	1	-,002	,010	,045
	Sig. (2-tailed)	,951	,106	,755	,766		,967	,862	,433
	N	300	300	300	300	300	300	300	300
HØYDE	Pearson Correlation	,045	-,013	,013	-,073	-,002	1	-,035	,095
	Sig. (2-tailed)	,440	,819	,818	,208	,967		,541	,100
	N	300	300	300	300	300	300	300	300
FØDSELSVEKT	Pearson Correlation	-,202**	,105	-,063	,059	,010	-,035	1	-,029
	Sig. (2-tailed)	,000	,069	,279	,308	,862	,541		,613
	N	300	300	300	300	300	300	300	300
TILKNYTNING	Pearson Correlation	-,118*	,112	,038	-,048	,045	,095	-,029	1
	Sig. (2-tailed)	,040	,053	,514	,407	,433	,100	,613	
	N	300	300	300	300	300	300	300	300

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,185[a]	,034	,031	4,241804304
2	,350[b]	,123	,114	4,056896580
3	[redacted]		,108	4,069609637
4	,414[d]	,172	,152	3,968602153

a. Predictors: (Constant), SØSKEN

b. Predictors: (Constant), SØSKEN, KJØNN, ALDER

c. Predictors: (Constant), SØSKEN, KJØNN, ALDER, HØYDE, IQ

d. Predictors: (Constant), SØSKEN, KJØNN, ALDER, HØYDE, IQ, FØDSELSVEKT, TILKNYTNING

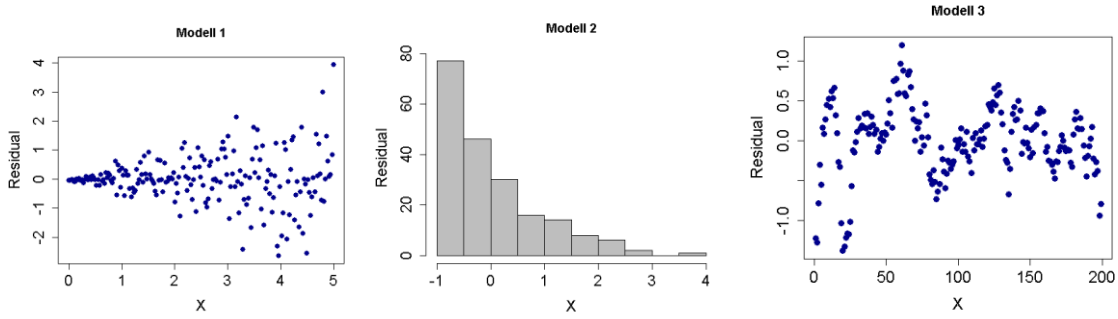
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	190,830	1	190,830	10,606	,001[b]
	Residual	5361,885	298	17,993		
	Total	5552,715	299			
2	Regression	681,026	3	227,009	13,793	,000[c]
	Residual	4871,689	296	16,458		
	Total	5552,715	299			
3	Regression	683,569	5	136,714	8,255	,000[d]
	Residual	4869,146	294	16,562		
	Total	5552,715	299			
4	Regression	953,773	7	136,253	8,651	,000[e]
	Residual	4598,942	292	15,750		
	Total	5552,715	299			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	12,207	,432		28,232	,000	11,356	13,058
	SØSKEN	-,588	,181	-,185	-3,257	,001	-,943	-,233
2	(Constant)	13,254	,538		24,652	,000	12,196	14,312
	SØSKEN	-,251	,184	-,079	-1,365	,173	-,614	,111
	ALDER	-,333	,062	-,311	-5,358	,000	-,455	-,211
	KJØNN	,478	,470	,055	1,018	,310	-,446	1,403
3	(Constant)	11,892	3,756		3,166	,002	4,499	19,285
	SØSKEN	-,255	,186	-,080	-1,371	,171	-,620	,111
	ALDER	-,331	,063	-,309	-5,285	,000	-,454	-,208
	KJØNN	,477	,471	,055	1,012	,312	-,451	1,405
	IQ	,003	,024	,007	,124	,901	-,044	,050
	HØYDE	,008	,022	,020	,372	,710	-,035	,052
4	(Constant)	21,793	4,442		4,906	,000	13,051	30,535
	SØSKEN	-,137	,184	-,043	[redacted]		[redacted]	
	ALDER	-,340	,061	-,317	-5,545	[redacted]		
	KJØNN	,417	[redacted]				-,490	1,325
	IQ	,005	[redacted]	,011	,209	[redacted]		
	HØYDE	,011	,022	,027	,508	,612	-,031	,053
	FØDSELSVEKT	-,002	,001	-,179	-3,336	,001	-,004	-,001
	TILKNYTNING	-,292	[redacted]	-,139	[redacted]			-,068

a. Dependent Variable: SJENERT


Modell 1
Residual
X
Modell 2
Residual
X
Modell 3
Residual
X

Formelark for PSY2014

Gjennomsnitt: $\bar{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$

Varians: $s_X^2 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})^2}{n-1}$

Standardavvik: $s_X = \sqrt{s_X^2}$

Kovarians: $s_{XY} = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{n-1}$

Pearson Korrelasjon: $r = \frac{s_{XY}}{s_X s_Y}$

Minste kvadraters estimater i bivariat regresjon. $\hat{b}_0 = \bar{Y} - \hat{b}_1 \cdot \bar{X}$ $\hat{b}_1 = \frac{\sum_{i=1}^{n}(X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sum_{i=1}^{n}(X_i - \bar{X})^2} = \frac{cov_{XY}}{s_X^2}$

Standardfeilen til estimatet av b_1 i en bivariat regresjon. $SE(\hat{b}_1) = \frac{s}{\sqrt{\sum(X_i - \bar{X})^2}}$ $s = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n-p-1}}$

Standardisert regresjonskoeffisient $\beta_i = b_i \frac{s_X}{s_Y}$

Sums of squares: $\sum(Y_i - \bar{Y})^2 = \sum(\hat{Y}_i - \bar{Y})^2 + \sum(Y_i - \hat{Y}_i)^2$

r^2: $r^2 = 1 - \frac{SS_{Residual}}{SS_{Total}}$ $Justert\ r^2 = 1 - \frac{(n-1)(1-r^2)}{n-p-1}$

Z-skåre: $Z = \frac{X - \mu}{\sigma_X}$

F-ratio: $F = \frac{MS_{Regression}}{MS_{Residual}}$, er i en multippel regresjonsanalyse fordelt F(df_1=p, df_2=n-p-1) under H_0.

T-test: $t = \frac{\hat{b}_i}{SE(\hat{b}_i)}$, er i en multippel regresjonsanalyse fordelt t(df=n-p-1) under H_0.

Kji-kvadrat: $\chi^2 = \sum \frac{(O-E)^2}{E}$, fordelt $\chi^2(df = (Rader - 1)(Kol - 1))\ under\ H_0$ $E_{kol\ i,radj} = \frac{R_j \times C_i}{n}$

$$standardisert\ \chi^2\ residual = \frac{O - E}{\sqrt{E\ (1 - rad\ proporsjon)(1 - kolonne\ proporsjon)}}$$

Enveis Anova (mellom-gruppe design):

$SS_{between}$: $SS_b = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(\bar{y}_j - \bar{y})^2 = \sum_{j=1}^{g} n_j(\bar{y}_j - \bar{y})^2$ $df_b = g - 1$

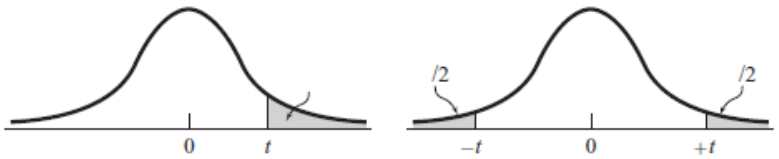
SS_{within} : $SS_w = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(y_{ij} - \bar{y}_j)^2$ $df_w = n - g$

For "standardfeilen" (SE) til en differanse mellom to gjennomsnitt bruker vi:

$SE_{diff} = \sqrt{\frac{2\ MSS_w}{n}}$ (der *n* er antall personer innad i hver gruppe).

$t = \frac{x_1 - x_2}{SE_{diff}}$, med frihetsgrader (df) fra MSSw

Appendix *t*: Percentage Points of the *t* Distribution



One-tailed test Two-tailed test

	Level of Significance for One-Tailed Test								
	0.25	*0.20*	*0.15*	*0.10*	*0.05*	*0.025*	*0.01*	*0.005*	*0.0005*
	Level of Significance for Two-Tailed Test								
df	*0.50*	*0.40*	*0.30*	*0.20*	*0.10*	*0.05*	*0.02*	*0.01*	*0.001*
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.620
2	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.599
3	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	12.924
4	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	5.408
8	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.768
24	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
50	0.679	0.849	1.047	1.299	1.676	2.009	2.403	2.678	3.496
100	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.390
∞	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.291

Source: The entries in this table were computed by the author.

Question 1
Attached

Correlations

		SJENERT	SØSKEN	KJØNN	ALDER	IQ	HØYDE	FØDSELSVEKT	TILKNYTNING
SJENERT	Pearson Correlation	1	-,185**	,052	-,338**	,004	,045	-,202**	-,118*
	Sig. (2-tailed)		,001	,372	,000	,951	,440	,000	,040
	N	300	300	300	300	300	300	300	300
SØSKEN	Pearson Correlation	-,185**	1	,026	,346**	,094	-,013	,105	,112
	Sig. (2-tailed)	,001		,653	,000	,106	,819	,069	,053
	N	300	300	300	300	300	300	300	300
KJØNN	Pearson Correlation	,052	,026	1	,005	-,018	,013	-,063	,038
	Sig. (2-tailed)	,372	,653		,928	,755	,818	,279	,514
	N	300	300	300	300	300	300	300	300
ALDER	Pearson Correlation	-,338**	,346**	,005	1	-,017	-,073	,059	-,048
	Sig. (2-tailed)	,000	,000	,928		,766	,208	,308	,407
	N	300	300	300	300	300	300	300	300
IQ	Pearson Correlation	,004	,094	-,018	-,017	1	-,002	,010	,045
	Sig. (2-tailed)	,951	,106	,755	,766		,967	,862	,433
	N	300	300	300	300	300	300	300	300
HØYDE	Pearson Correlation	,045	-,013	,013	-,073	-,002	1	-,035	,095
	Sig. (2-tailed)	,440	,819	,818	,208	,967		,541	,100
	N	300	300	300	300	300	300	300	300
FØDSELSVEKT	Pearson Correlation	-,202**	,105	-,063	,059	,010	-,035	1	-,029
	Sig. (2-tailed)	,000	,069	,279	,308	,862	,541		,613
	N	300	300	300	300	300	300	300	300
TILKNYTNING	Pearson Correlation	-,118*	,112	,038	-,048	,045	,095	-,029	1
	Sig. (2-tailed)	,040	,053	,514	,407	,433	,100	,613	
	N	300	300	300	300	300	300	300	300

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,185[a]	,034	,031	4,241804304
2	,350[b]	,123	,114	4,056896580
3	[redacted]		,108	4,069609637
4	,414[d]	,172	,152	3,968602153

a. Predictors: (Constant), SØSKEN

b. Predictors: (Constant), SØSKEN, KJØNN, ALDER

c. Predictors: (Constant), SØSKEN, KJØNN, ALDER, HØYDE, IQ

d. Predictors: (Constant), SØSKEN, KJØNN, ALDER, HØYDE, IQ, FØDSELSVEKT, TILKNYTNING

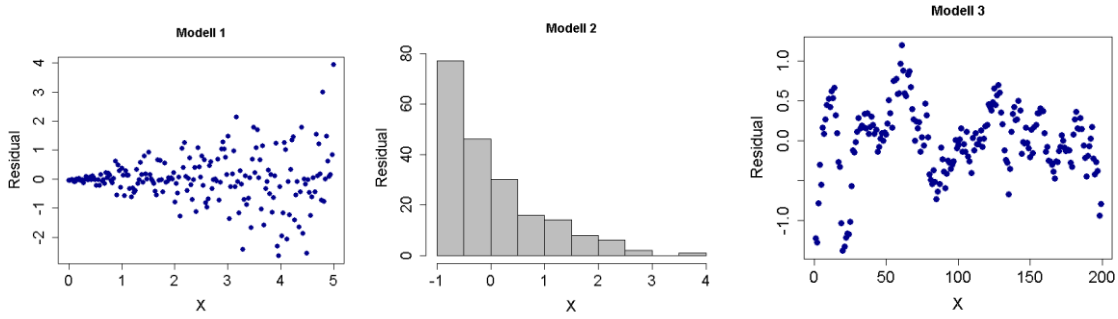
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	190,830	1	190,830	10,606	,001[b]
	Residual	5361,885	298	17,993		
	Total	5552,715	299			
2	Regression	681,026	3	227,009	13,793	,000[c]
	Residual	4871,689	296	16,458		
	Total	5552,715	299			
3	Regression	683,569	5	136,714	8,255	,000[d]
	Residual	4869,146	294	16,562		
	Total	5552,715	299			
4	Regression	953,773	7	136,253	8,651	,000[e]
	Residual	4598,942	292	15,750		
	Total	5552,715	299			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	12,207	,432		28,232	,000	11,356	13,058
	SØSKEN	-,588	,181	-,185	-3,257	,001	-,943	-,233
2	(Constant)	13,254	,538		24,652	,000	12,196	14,312
	SØSKEN	-,251	,184	-,079	-1,365	,173	-,614	,111
	ALDER	-,333	,062	-,311	-5,358	,000	-,455	-,211
	KJØNN	,478	,470	,055	1,018	,310	-,446	1,403
3	(Constant)	11,892	3,756		3,166	,002	4,499	19,285
	SØSKEN	-,255	,186	-,080	-1,371	,171	-,620	,111
	ALDER	-,331	,063	-,309	-5,285	,000	-,454	-,208
	KJØNN	,477	,471	,055	1,012	,312	-,451	1,405
	IQ	,003	,024	,007	,124	,901	-,044	,050
	HØYDE	,008	,022	,020	,372	,710	-,035	,052
4	(Constant)	21,793	4,442		4,906	,000	13,051	30,535
	SØSKEN	-,137	,184	-,043	[redacted]		[redacted]	
	ALDER	-,340	,061	-,317	-5,545	[redacted]		
	KJØNN	,417	[redacted]				-,490	1,325
	IQ	,005	[redacted]	,011	,209	[redacted]		
	HØYDE	,011	,022	,027	,508	,612	-,031	,053
	FØDSELSVEKT	-,002	,001	-,179	-3,336	,001	-,004	-,001
	TILKNYTNING	-,292	[redacted]	-,139	[redacted]			-,068

a. Dependent Variable: SJENERT


Modell 1
Residual
X
Modell 2
Residual
X
Modell 3
Residual
X

Formelark for PSY2014

Gjennomsnitt: $\bar{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$

Varians: $s_X^2 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})^2}{n-1}$

Standardavvik: $s_X = \sqrt{s_X^2}$

Kovarians: $s_{XY} = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{n-1}$

Pearson Korrelasjon: $r = \frac{s_{XY}}{s_X s_Y}$

Minste kvadraters estimater i bivariat regresjon. $\hat{b}_0 = \bar{Y} - \hat{b}_1 \cdot \bar{X}$ $\hat{b}_1 = \frac{\sum_{i=1}^{n}(X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sum_{i=1}^{n}(X_i - \bar{X})^2} = \frac{cov_{XY}}{s_X^2}$

Standardfeilen til estimatet av b_1 i en bivariat regresjon. $SE(\hat{b}_1) = \frac{s}{\sqrt{\sum(X_i - \bar{X})^2}}$ $s = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n-p-1}}$

Standardisert regresjonskoeffisient $\beta_i = b_i \frac{s_X}{s_Y}$

Sums of squares: $\sum(Y_i - \bar{Y})^2 = \sum(\hat{Y}_i - \bar{Y})^2 + \sum(Y_i - \hat{Y}_i)^2$

r^2: $r^2 = 1 - \frac{SS_{Residual}}{SS_{Total}}$ $Justert\ r^2 = 1 - \frac{(n-1)(1-r^2)}{n-p-1}$

Z-skåre: $Z = \frac{X - \mu}{\sigma_X}$

F-ratio: $F = \frac{MS_{Regression}}{MS_{Residual}}$, er i en multippel regresjonsanalyse fordelt F(df_1=p, df_2=n-p-1) under H_0.

T-test: $t = \frac{\hat{b}_i}{SE(\hat{b}_i)}$, er i en multippel regresjonsanalyse fordelt t(df=n-p-1) under H_0.

Kji-kvadrat: $\chi^2 = \sum \frac{(O-E)^2}{E}$, fordelt $\chi^2(df = (Rader - 1)(Kol - 1))\ under\ H_0$ $E_{kol\ i,radj} = \frac{R_j \times C_i}{n}$

$$standardisert\ \chi^2\ residual = \frac{O - E}{\sqrt{E\ (1 - rad\ proporsjon)(1 - kolonne\ proporsjon)}}$$

Enveis Anova (mellom-gruppe design):

$SS_{between}$: $SS_b = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(\bar{y}_j - \bar{y})^2 = \sum_{j=1}^{g} n_j(\bar{y}_j - \bar{y})^2$ $df_b = g - 1$

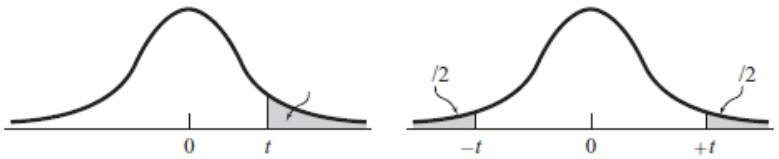
SS_{within} : $SS_w = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(y_{ij} - \bar{y}_j)^2$ $df_w = n - g$

For "standardfeilen" (SE) til en differanse mellom to gjennomsnitt bruker vi:

$SE_{diff} = \sqrt{\frac{2\ MSS_w}{n}}$ (der *n* er antall personer innad i hver gruppe).

$t = \frac{x_1 - x_2}{SE_{diff}}$, med frihetsgrader (df) fra MSSw

Appendix *t*: Percentage Points of the *t* Distribution



One-tailed test Two-tailed test

	Level of Significance for One-Tailed Test								
	0.25	*0.20*	*0.15*	*0.10*	*0.05*	*0.025*	*0.01*	*0.005*	*0.0005*
	Level of Significance for Two-Tailed Test								
df	*0.50*	*0.40*	*0.30*	*0.20*	*0.10*	*0.05*	*0.02*	*0.01*	*0.001*
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.620
2	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.599
3	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	12.924
4	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	5.408
8	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.768
24	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
50	0.679	0.849	1.047	1.299	1.676	2.009	2.403	2.678	3.496
100	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.390
∞	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.291

Source: The entries in this table were computed by the author.

Question 2
Attached

Correlations

		SJENERT	SØSKEN	KJØNN	ALDER	IQ	HØYDE	FØDSELSVEKT	TILKNYTNING
SJENERT	Pearson Correlation	1	-,185**	,052	-,338**	,004	,045	-,202**	-,118*
	Sig. (2-tailed)		,001	,372	,000	,951	,440	,000	,040
	N	300	300	300	300	300	300	300	300
SØSKEN	Pearson Correlation	-,185**	1	,026	,346**	,094	-,013	,105	,112
	Sig. (2-tailed)	,001		,653	,000	,106	,819	,069	,053
	N	300	300	300	300	300	300	300	300
KJØNN	Pearson Correlation	,052	,026	1	,005	-,018	,013	-,063	,038
	Sig. (2-tailed)	,372	,653		,928	,755	,818	,279	,514
	N	300	300	300	300	300	300	300	300
ALDER	Pearson Correlation	-,338**	,346**	,005	1	-,017	-,073	,059	-,048
	Sig. (2-tailed)	,000	,000	,928		,766	,208	,308	,407
	N	300	300	300	300	300	300	300	300
IQ	Pearson Correlation	,004	,094	-,018	-,017	1	-,002	,010	,045
	Sig. (2-tailed)	,951	,106	,755	,766		,967	,862	,433
	N	300	300	300	300	300	300	300	300
HØYDE	Pearson Correlation	,045	-,013	,013	-,073	-,002	1	-,035	,095
	Sig. (2-tailed)	,440	,819	,818	,208	,967		,541	,100
	N	300	300	300	300	300	300	300	300
FØDSELSVEKT	Pearson Correlation	-,202**	,105	-,063	,059	,010	-,035	1	-,029
	Sig. (2-tailed)	,000	,069	,279	,308	,862	,541		,613
	N	300	300	300	300	300	300	300	300
TILKNYTNING	Pearson Correlation	-,118*	,112	,038	-,048	,045	,095	-,029	1
	Sig. (2-tailed)	,040	,053	,514	,407	,433	,100	,613	
	N	300	300	300	300	300	300	300	300

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,185[a]	,034	,031	4,241804304
2	,350[b]	,123	,114	4,056896580
3	[redacted]		,108	4,069609637
4	,414[d]	,172	,152	3,968602153

a. Predictors: (Constant), SØSKEN

b. Predictors: (Constant), SØSKEN, KJØNN, ALDER

c. Predictors: (Constant), SØSKEN, KJØNN, ALDER, HØYDE, IQ

d. Predictors: (Constant), SØSKEN, KJØNN, ALDER, HØYDE, IQ, FØDSELSVEKT, TILKNYTNING

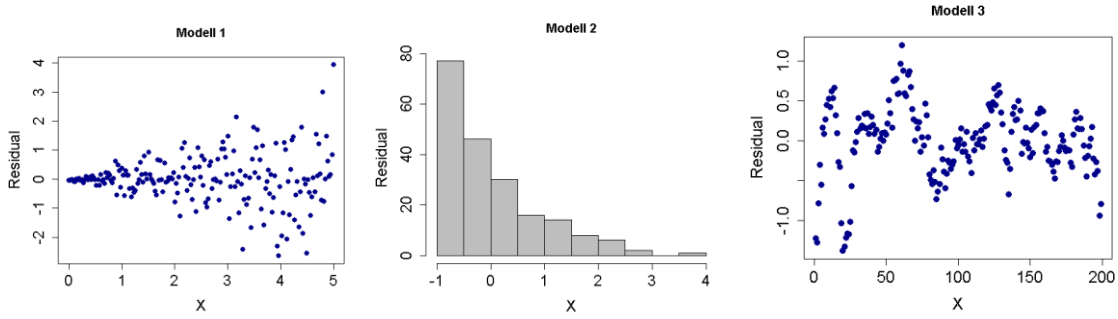
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	190,830	1	190,830	10,606	,001[b]
	Residual	5361,885	298	17,993		
	Total	5552,715	299			
2	Regression	681,026	3	227,009	13,793	,000[c]
	Residual	4871,689	296	16,458		
	Total	5552,715	299			
3	Regression	683,569	5	136,714	8,255	,000[d]
	Residual	4869,146	294	16,562		
	Total	5552,715	299			
4	Regression	953,773	7	136,253	8,651	,000[e]
	Residual	4598,942	292	15,750		
	Total	5552,715	299			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	12,207	,432		28,232	,000	11,356	13,058
	SØSKEN	-,588	,181	-,185	-3,257	,001	-,943	-,233
2	(Constant)	13,254	,538		24,652	,000	12,196	14,312
	SØSKEN	-,251	,184	-,079	-1,365	,173	-,614	,111
	ALDER	-,333	,062	-,311	-5,358	,000	-,455	-,211
	KJØNN	,478	,470	,055	1,018	,310	-,446	1,403
3	(Constant)	11,892	3,756		3,166	,002	4,499	19,285
	SØSKEN	-,255	,186	-,080	-1,371	,171	-,620	,111
	ALDER	-,331	,063	-,309	-5,285	,000	-,454	-,208
	KJØNN	,477	,471	,055	1,012	,312	-,451	1,405
	IQ	,003	,024	,007	,124	,901	-,044	,050
	HØYDE	,008	,022	,020	,372	,710	-,035	,052
4	(Constant)	21,793	4,442		4,906	,000	13,051	30,535
	SØSKEN	-,137	,184	-,043	[redacted]		[redacted]	
	ALDER	-,340	,061	-,317	-5,545	[redacted]		
	KJØNN	,417	[redacted]				-,490	1,325
	IQ	,005	[redacted]	,011	,209	[redacted]		
	HØYDE	,011	,022	,027	,508	,612	-,031	,053
	FØDSELSVEKT	-,002	,001	-,179	-3,336	,001	-,004	-,001
	TILKNYTNING	-,292	[redacted]	-,139	[redacted]			-,068

a. Dependent Variable: SJENERT


Modell 1
Residual
X
Modell 2
Residual
X
Modell 3
Residual
X

Formelark for PSY2014

Gjennomsnitt: $\bar{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$

Varians: $s_X^2 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})^2}{n-1}$

Standardavvik: $s_X = \sqrt{s_X^2}$

Kovarians: $s_{XY} = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{n-1}$

Pearson Korrelasjon: $r = \frac{s_{XY}}{s_X s_Y}$

Minste kvadraters estimater i bivariat regresjon. $\hat{b}_0 = \bar{Y} - \hat{b}_1 \cdot \bar{X}$ $\hat{b}_1 = \frac{\sum_{i=1}^{n}(X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sum_{i=1}^{n}(X_i - \bar{X})^2} = \frac{cov_{XY}}{s_X^2}$

Standardfeilen til estimatet av b_1 i en bivariat regresjon. $SE(\hat{b}_1) = \frac{s}{\sqrt{\sum(X_i - \bar{X})^2}}$ $s = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n-p-1}}$

Standardisert regresjonskoeffisient $\beta_i = b_i \frac{s_X}{s_Y}$

Sums of squares: $\sum(Y_i - \bar{Y})^2 = \sum(\hat{Y}_i - \bar{Y})^2 + \sum(Y_i - \hat{Y}_i)^2$

r^2: $r^2 = 1 - \frac{SS_{Residual}}{SS_{Total}}$ $Justert\ r^2 = 1 - \frac{(n-1)(1-r^2)}{n-p-1}$

Z-skåre: $Z = \frac{X - \mu}{\sigma_X}$

F-ratio: $F = \frac{MS_{Regression}}{MS_{Residual}}$, er i en multippel regresjonsanalyse fordelt F(df_1=p, df_2=n-p-1) under H_0.

T-test: $t = \frac{\hat{b}_i}{SE(\hat{b}_i)}$, er i en multippel regresjonsanalyse fordelt t(df=n-p-1) under H_0.

Kji-kvadrat: $\chi^2 = \sum \frac{(O-E)^2}{E}$, fordelt $\chi^2(df = (Rader - 1)(Kol - 1))\ under\ H_0$ $E_{kol\ i,radj} = \frac{R_j \times C_i}{n}$

$$standardisert\ \chi^2\ residual = \frac{O - E}{\sqrt{E\ (1 - rad\ proporsjon)(1 - kolonne\ proporsjon)}}$$

Enveis Anova (mellom-gruppe design):

$SS_{between}$: $SS_b = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(\bar{y}_j - \bar{y})^2 = \sum_{j=1}^{g} n_j(\bar{y}_j - \bar{y})^2$ $df_b = g - 1$

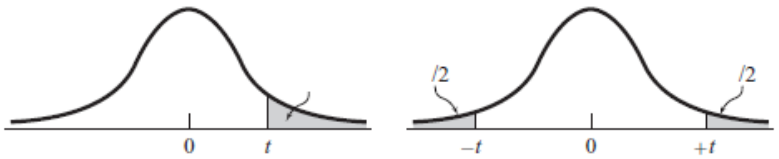
SS_{within} : $SS_w = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(y_{ij} - \bar{y}_j)^2$ $df_w = n - g$

For "standardfeilen" (SE) til en differanse mellom to gjennomsnitt bruker vi:

$SE_{diff} = \sqrt{\frac{2\ MSS_w}{n}}$ (der *n* er antall personer innad i hver gruppe).

$t = \frac{x_1 - x_2}{SE_{diff}}$, med frihetsgrader (df) fra MSSw

Appendix *t*: Percentage Points of the *t* Distribution



One-tailed test Two-tailed test

	Level of Significance for One-Tailed Test								
	0.25	*0.20*	*0.15*	*0.10*	*0.05*	*0.025*	*0.01*	*0.005*	*0.0005*
	Level of Significance for Two-Tailed Test								
df	*0.50*	*0.40*	*0.30*	*0.20*	*0.10*	*0.05*	*0.02*	*0.01*	*0.001*
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.620
2	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.599
3	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	12.924
4	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	5.408
8	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.768
24	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
50	0.679	0.849	1.047	1.299	1.676	2.009	2.403	2.678	3.496
100	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.390
∞	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.291

Source: The entries in this table were computed by the author.

Question 2
Attached

Correlations

		SJENERT	SØSKEN	KJØNN	ALDER	IQ	HØYDE	FØDSELSVEKT	TILKNYTNING
SJENERT	Pearson Correlation	1	-,185**	,052	-,338**	,004	,045	-,202**	-,118*
	Sig. (2-tailed)		,001	,372	,000	,951	,440	,000	,040
	N	300	300	300	300	300	300	300	300
SØSKEN	Pearson Correlation	-,185**	1	,026	,346**	,094	-,013	,105	,112
	Sig. (2-tailed)	,001		,653	,000	,106	,819	,069	,053
	N	300	300	300	300	300	300	300	300
KJØNN	Pearson Correlation	,052	,026	1	,005	-,018	,013	-,063	,038
	Sig. (2-tailed)	,372	,653		,928	,755	,818	,279	,514
	N	300	300	300	300	300	300	300	300
ALDER	Pearson Correlation	-,338**	,346**	,005	1	-,017	-,073	,059	-,048
	Sig. (2-tailed)	,000	,000	,928		,766	,208	,308	,407
	N	300	300	300	300	300	300	300	300
IQ	Pearson Correlation	,004	,094	-,018	-,017	1	-,002	,010	,045
	Sig. (2-tailed)	,951	,106	,755	,766		,967	,862	,433
	N	300	300	300	300	300	300	300	300
HØYDE	Pearson Correlation	,045	-,013	,013	-,073	-,002	1	-,035	,095
	Sig. (2-tailed)	,440	,819	,818	,208	,967		,541	,100
	N	300	300	300	300	300	300	300	300
FØDSELSVEKT	Pearson Correlation	-,202**	,105	-,063	,059	,010	-,035	1	-,029
	Sig. (2-tailed)	,000	,069	,279	,308	,862	,541		,613
	N	300	300	300	300	300	300	300	300
TILKNYTNING	Pearson Correlation	-,118*	,112	,038	-,048	,045	,095	-,029	1
	Sig. (2-tailed)	,040	,053	,514	,407	,433	,100	,613	
	N	300	300	300	300	300	300	300	300

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,185[a]	,034	,031	4,241804304
2	,350[b]	,123	,114	4,056896580
3	[redacted]		,108	4,069609637
4	,414[d]	,172	,152	3,968602153

a. Predictors: (Constant), SØSKEN

b. Predictors: (Constant), SØSKEN, KJØNN, ALDER

c. Predictors: (Constant), SØSKEN, KJØNN, ALDER, HØYDE, IQ

d. Predictors: (Constant), SØSKEN, KJØNN, ALDER, HØYDE, IQ, FØDSELSVEKT, TILKNYTNING

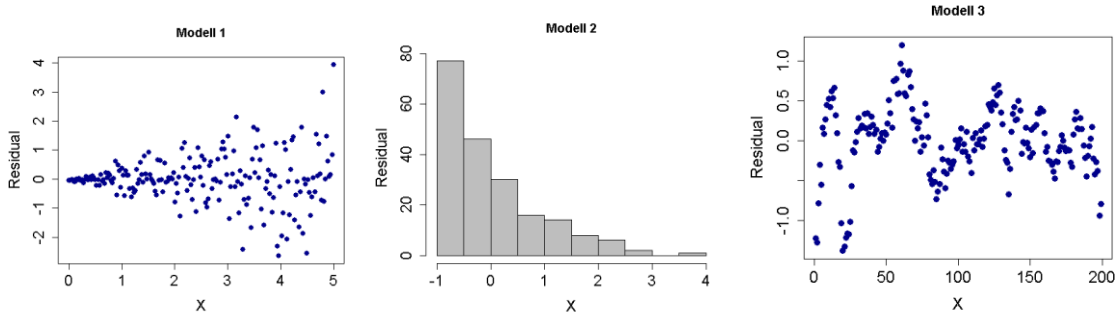
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	190,830	1	190,830	10,606	,001[b]
	Residual	5361,885	298	17,993		
	Total	5552,715	299			
2	Regression	681,026	3	227,009	13,793	,000[c]
	Residual	4871,689	296	16,458		
	Total	5552,715	299			
3	Regression	683,569	5	136,714	8,255	,000[d]
	Residual	4869,146	294	16,562		
	Total	5552,715	299			
4	Regression	953,773	7	136,253	8,651	,000[e]
	Residual	4598,942	292	15,750		
	Total	5552,715	299			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	12,207	,432		28,232	,000	11,356	13,058
	SØSKEN	-,588	,181	-,185	-3,257	,001	-,943	-,233
2	(Constant)	13,254	,538		24,652	,000	12,196	14,312
	SØSKEN	-,251	,184	-,079	-1,365	,173	-,614	,111
	ALDER	-,333	,062	-,311	-5,358	,000	-,455	-,211
	KJØNN	,478	,470	,055	1,018	,310	-,446	1,403
3	(Constant)	11,892	3,756		3,166	,002	4,499	19,285
	SØSKEN	-,255	,186	-,080	-1,371	,171	-,620	,111
	ALDER	-,331	,063	-,309	-5,285	,000	-,454	-,208
	KJØNN	,477	,471	,055	1,012	,312	-,451	1,405
	IQ	,003	,024	,007	,124	,901	-,044	,050
	HØYDE	,008	,022	,020	,372	,710	-,035	,052
4	(Constant)	21,793	4,442		4,906	,000	13,051	30,535
	SØSKEN	-,137	,184	-,043	[redacted]		[redacted]	
	ALDER	-,340	,061	-,317	-5,545	[redacted]		
	KJØNN	,417	[redacted]				-,490	1,325
	IQ	,005	[redacted]	,011	,209	[redacted]		
	HØYDE	,011	,022	,027	,508	,612	-,031	,053
	FØDSELSVEKT	-,002	,001	-,179	-3,336	,001	-,004	-,001
	TILKNYTNING	-,292	[redacted]	-,139	[redacted]			-,068

a. Dependent Variable: SJENERT


Modell 1
Residual
X
Modell 2
Residual
X
Modell 3
Residual
X

Formelark for PSY2014

Gjennomsnitt: $\bar{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$

Varians: $s_X^2 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})^2}{n-1}$

Standardavvik: $s_X = \sqrt{s_X^2}$

Kovarians: $s_{XY} = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{n-1}$

Pearson Korrelasjon: $r = \frac{s_{XY}}{s_X s_Y}$

Minste kvadraters estimater i bivariat regresjon. $\hat{b}_0 = \bar{Y} - \hat{b}_1 \cdot \bar{X}$ $\hat{b}_1 = \frac{\sum_{i=1}^{n}(X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sum_{i=1}^{n}(X_i - \bar{X})^2} = \frac{cov_{XY}}{s_X^2}$

Standardfeilen til estimatet av b_1 i en bivariat regresjon. $SE(\hat{b}_1) = \frac{s}{\sqrt{\sum(X_i - \bar{X})^2}}$ $s = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n-p-1}}$

Standardisert regresjonskoeffisient $\beta_i = b_i \frac{s_X}{s_Y}$

Sums of squares: $\sum(Y_i - \bar{Y})^2 = \sum(\hat{Y}_i - \bar{Y})^2 + \sum(Y_i - \hat{Y}_i)^2$

r^2: $r^2 = 1 - \frac{SS_{Residual}}{SS_{Total}}$ $Justert\ r^2 = 1 - \frac{(n-1)(1-r^2)}{n-p-1}$

Z-skåre: $Z = \frac{X - \mu}{\sigma_X}$

F-ratio: $F = \frac{MS_{Regression}}{MS_{Residual}}$, er i en multippel regresjonsanalyse fordelt F(df_1=p, df_2=n-p-1) under H_0.

T-test: $t = \frac{\hat{b}_i}{SE(\hat{b}_i)}$, er i en multippel regresjonsanalyse fordelt t(df=n-p-1) under H_0.

Kji-kvadrat: $\chi^2 = \sum \frac{(O-E)^2}{E}$, fordelt $\chi^2(df = (Rader - 1)(Kol - 1))\ under\ H_0$ $E_{kol\ i,radj} = \frac{R_j \times C_i}{n}$

$$standardisert\ \chi^2\ residual = \frac{O - E}{\sqrt{E\ (1 - rad\ proporsjon)(1 - kolonne\ proporsjon)}}$$

Enveis Anova (mellom-gruppe design):

$SS_{between}$: $SS_b = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(\bar{y}_j - \bar{y})^2 = \sum_{j=1}^{g} n_j(\bar{y}_j - \bar{y})^2$ $df_b = g - 1$

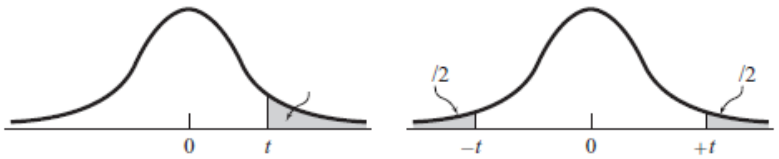
SS_{within} : $SS_w = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(y_{ij} - \bar{y}_j)^2$ $df_w = n - g$

For "standardfeilen" (SE) til en differanse mellom to gjennomsnitt bruker vi:

$SE_{diff} = \sqrt{\frac{2\ MSS_w}{n}}$ (der *n* er antall personer innad i hver gruppe).

$t = \frac{x_1 - x_2}{SE_{diff}}$, med frihetsgrader (df) fra MSSw

Appendix *t*: Percentage Points of the *t* Distribution



One-tailed test Two-tailed test

	Level of Significance for One-Tailed Test								
	0.25	*0.20*	*0.15*	*0.10*	*0.05*	*0.025*	*0.01*	*0.005*	*0.0005*
	Level of Significance for Two-Tailed Test								
df	*0.50*	*0.40*	*0.30*	*0.20*	*0.10*	*0.05*	*0.02*	*0.01*	*0.001*
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.620
2	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.599
3	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	12.924
4	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	5.408
8	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.768
24	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
50	0.679	0.849	1.047	1.299	1.676	2.009	2.403	2.678	3.496
100	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.390
∞	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.291

Source: The entries in this table were computed by the author.

Question 3
Attached

Correlations

		SJENERT	SØSKEN	KJØNN	ALDER	IQ	HØYDE	FØDSELSVEKT	TILKNYTNING
SJENERT	Pearson Correlation	1	-,185**	,052	-,338**	,004	,045	-,202**	-,118*
	Sig. (2-tailed)		,001	,372	,000	,951	,440	,000	,040
	N	300	300	300	300	300	300	300	300
SØSKEN	Pearson Correlation	-,185**	1	,026	,346**	,094	-,013	,105	,112
	Sig. (2-tailed)	,001		,653	,000	,106	,819	,069	,053
	N	300	300	300	300	300	300	300	300
KJØNN	Pearson Correlation	,052	,026	1	,005	-,018	,013	-,063	,038
	Sig. (2-tailed)	,372	,653		,928	,755	,818	,279	,514
	N	300	300	300	300	300	300	300	300
ALDER	Pearson Correlation	-,338**	,346**	,005	1	-,017	-,073	,059	-,048
	Sig. (2-tailed)	,000	,000	,928		,766	,208	,308	,407
	N	300	300	300	300	300	300	300	300
IQ	Pearson Correlation	,004	,094	-,018	-,017	1	-,002	,010	,045
	Sig. (2-tailed)	,951	,106	,755	,766		,967	,862	,433
	N	300	300	300	300	300	300	300	300
HØYDE	Pearson Correlation	,045	-,013	,013	-,073	-,002	1	-,035	,095
	Sig. (2-tailed)	,440	,819	,818	,208	,967		,541	,100
	N	300	300	300	300	300	300	300	300
FØDSELSVEKT	Pearson Correlation	-,202**	,105	-,063	,059	,010	-,035	1	-,029
	Sig. (2-tailed)	,000	,069	,279	,308	,862	,541		,613
	N	300	300	300	300	300	300	300	300
TILKNYTNING	Pearson Correlation	-,118*	,112	,038	-,048	,045	,095	-,029	1
	Sig. (2-tailed)	,040	,053	,514	,407	,433	,100	,613	
	N	300	300	300	300	300	300	300	300

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,185[a]	,034	,031	4,241804304
2	,350[b]	,123	,114	4,056896580
3	[redacted]		,108	4,069609637
4	,414[d]	,172	,152	3,968602153

a. Predictors: (Constant), SØSKEN

b. Predictors: (Constant), SØSKEN, KJØNN, ALDER

c. Predictors: (Constant), SØSKEN, KJØNN, ALDER, HØYDE, IQ

d. Predictors: (Constant), SØSKEN, KJØNN, ALDER, HØYDE, IQ, FØDSELSVEKT, TILKNYTNING

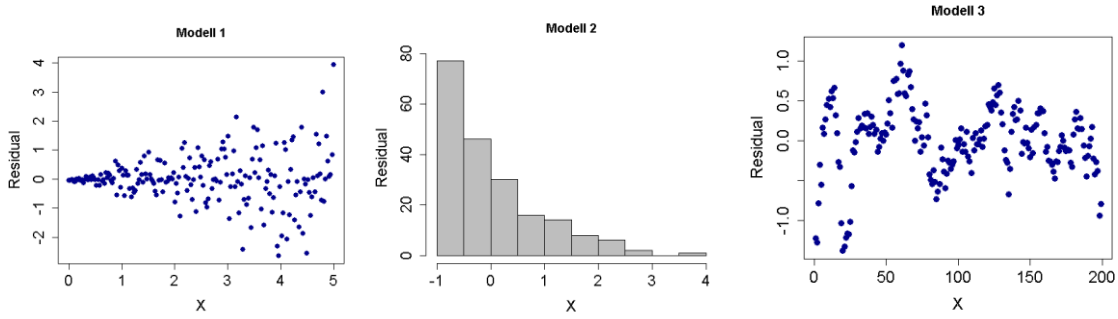
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	190,830	1	190,830	10,606	,001[b]
	Residual	5361,885	298	17,993		
	Total	5552,715	299			
2	Regression	681,026	3	227,009	13,793	,000[c]
	Residual	4871,689	296	16,458		
	Total	5552,715	299			
3	Regression	683,569	5	136,714	8,255	,000[d]
	Residual	4869,146	294	16,562		
	Total	5552,715	299			
4	Regression	953,773	7	136,253	8,651	,000[e]
	Residual	4598,942	292	15,750		
	Total	5552,715	299			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	12,207	,432		28,232	,000	11,356	13,058
	SØSKEN	-,588	,181	-,185	-3,257	,001	-,943	-,233
2	(Constant)	13,254	,538		24,652	,000	12,196	14,312
	SØSKEN	-,251	,184	-,079	-1,365	,173	-,614	,111
	ALDER	-,333	,062	-,311	-5,358	,000	-,455	-,211
	KJØNN	,478	,470	,055	1,018	,310	-,446	1,403
3	(Constant)	11,892	3,756		3,166	,002	4,499	19,285
	SØSKEN	-,255	,186	-,080	-1,371	,171	-,620	,111
	ALDER	-,331	,063	-,309	-5,285	,000	-,454	-,208
	KJØNN	,477	,471	,055	1,012	,312	-,451	1,405
	IQ	,003	,024	,007	,124	,901	-,044	,050
	HØYDE	,008	,022	,020	,372	,710	-,035	,052
4	(Constant)	21,793	4,442		4,906	,000	13,051	30,535
	SØSKEN	-,137	,184	-,043	[redacted]		[redacted]	
	ALDER	-,340	,061	-,317	-5,545	[redacted]		
	KJØNN	,417	[redacted]				-,490	1,325
	IQ	,005	[redacted]	,011	,209	[redacted]		
	HØYDE	,011	,022	,027	,508	,612	-,031	,053
	FØDSELSVEKT	-,002	,001	-,179	-3,336	,001	-,004	-,001
	TILKNYTNING	-,292	[redacted]	-,139	[redacted]			-,068

a. Dependent Variable: SJENERT


Modell 1
Residual
X
Modell 2
Residual
X
Modell 3
Residual
X

Formelark for PSY2014

Gjennomsnitt: $\bar{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$

Varians: $s_X^2 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})^2}{n-1}$

Standardavvik: $s_X = \sqrt{s_X^2}$

Kovarians: $s_{XY} = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{n-1}$

Pearson Korrelasjon: $r = \frac{s_{XY}}{s_X s_Y}$

Minste kvadraters estimater i bivariat regresjon. $\hat{b}_0 = \bar{Y} - \hat{b}_1 \cdot \bar{X}$ $\hat{b}_1 = \frac{\sum_{i=1}^{n}(X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sum_{i=1}^{n}(X_i - \bar{X})^2} = \frac{cov_{XY}}{s_X^2}$

Standardfeilen til estimatet av b_1 i en bivariat regresjon. $SE(\hat{b}_1) = \frac{s}{\sqrt{\sum(X_i - \bar{X})^2}}$ $s = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n-p-1}}$

Standardisert regresjonskoeffisient $\beta_i = b_i \frac{s_X}{s_Y}$

Sums of squares: $\sum(Y_i - \bar{Y})^2 = \sum(\hat{Y}_i - \bar{Y})^2 + \sum(Y_i - \hat{Y}_i)^2$

r^2: $r^2 = 1 - \frac{SS_{Residual}}{SS_{Total}}$ $Justert\ r^2 = 1 - \frac{(n-1)(1-r^2)}{n-p-1}$

Z-skåre: $Z = \frac{X - \mu}{\sigma_X}$

F-ratio: $F = \frac{MS_{Regression}}{MS_{Residual}}$, er i en multippel regresjonsanalyse fordelt F(df_1=p, df_2=n-p-1) under H_0.

T-test: $t = \frac{\hat{b}_i}{SE(\hat{b}_i)}$, er i en multippel regresjonsanalyse fordelt t(df=n-p-1) under H_0.

Kji-kvadrat: $\chi^2 = \sum \frac{(O-E)^2}{E}$, fordelt $\chi^2(df = (Rader - 1)(Kol - 1))\ under\ H_0$ $E_{kol\ i,radj} = \frac{R_j \times C_i}{n}$

$$standardisert\ \chi^2\ residual = \frac{O - E}{\sqrt{E\ (1 - rad\ proporsjon)(1 - kolonne\ proporsjon)}}$$

Enveis Anova (mellom-gruppe design):

$SS_{between}$: $SS_b = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(\bar{y}_j - \bar{y})^2 = \sum_{j=1}^{g} n_j(\bar{y}_j - \bar{y})^2$ $df_b = g - 1$

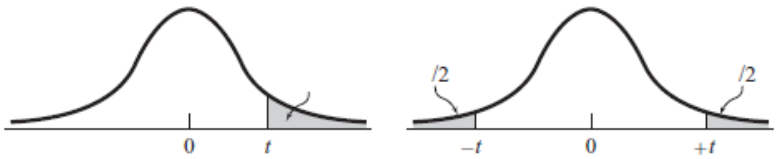
SS_{within} : $SS_w = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(y_{ij} - \bar{y}_j)^2$ $df_w = n - g$

For "standardfeilen" (SE) til en differanse mellom to gjennomsnitt bruker vi:

$SE_{diff} = \sqrt{\frac{2\ MSS_w}{n}}$ (der *n* er antall personer innad i hver gruppe).

$t = \frac{x_1 - x_2}{SE_{diff}}$, med frihetsgrader (df) fra MSSw

Appendix *t*: Percentage Points of the *t* Distribution



One-tailed test Two-tailed test

	Level of Significance for One-Tailed Test								
	0.25	*0.20*	*0.15*	*0.10*	*0.05*	*0.025*	*0.01*	*0.005*	*0.0005*
	Level of Significance for Two-Tailed Test								
df	*0.50*	*0.40*	*0.30*	*0.20*	*0.10*	*0.05*	*0.02*	*0.01*	*0.001*
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.620
2	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.599
3	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	12.924
4	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	5.408
8	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.768
24	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
50	0.679	0.849	1.047	1.299	1.676	2.009	2.403	2.678	3.496
100	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.390
∞	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.291

Source: The entries in this table were computed by the author.

Question 3
Attached

Correlations

		SJENERT	SØSKEN	KJØNN	ALDER	IQ	HØYDE	FØDSELSVEKT	TILKNYTNING
SJENERT	Pearson Correlation	1	-,185**	,052	-,338**	,004	,045	-,202**	-,118*
	Sig. (2-tailed)		,001	,372	,000	,951	,440	,000	,040
	N	300	300	300	300	300	300	300	300
SØSKEN	Pearson Correlation	-,185**	1	,026	,346**	,094	-,013	,105	,112
	Sig. (2-tailed)	,001		,653	,000	,106	,819	,069	,053
	N	300	300	300	300	300	300	300	300
KJØNN	Pearson Correlation	,052	,026	1	,005	-,018	,013	-,063	,038
	Sig. (2-tailed)	,372	,653		,928	,755	,818	,279	,514
	N	300	300	300	300	300	300	300	300
ALDER	Pearson Correlation	-,338**	,346**	,005	1	-,017	-,073	,059	-,048
	Sig. (2-tailed)	,000	,000	,928		,766	,208	,308	,407
	N	300	300	300	300	300	300	300	300
IQ	Pearson Correlation	,004	,094	-,018	-,017	1	-,002	,010	,045
	Sig. (2-tailed)	,951	,106	,755	,766		,967	,862	,433
	N	300	300	300	300	300	300	300	300
HØYDE	Pearson Correlation	,045	-,013	,013	-,073	-,002	1	-,035	,095
	Sig. (2-tailed)	,440	,819	,818	,208	,967		,541	,100
	N	300	300	300	300	300	300	300	300
FØDSELSVEKT	Pearson Correlation	-,202**	,105	-,063	,059	,010	-,035	1	-,029
	Sig. (2-tailed)	,000	,069	,279	,308	,862	,541		,613
	N	300	300	300	300	300	300	300	300
TILKNYTNING	Pearson Correlation	-,118*	,112	,038	-,048	,045	,095	-,029	1
	Sig. (2-tailed)	,040	,053	,514	,407	,433	,100	,613	
	N	300	300	300	300	300	300	300	300

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,185[a]	,034	,031	4,241804304
2	,350[b]	,123	,114	4,056896580
3	[redacted]		,108	4,069609637
4	,414[d]	,172	,152	3,968602153

a. Predictors: (Constant), SØSKEN

b. Predictors: (Constant), SØSKEN, KJØNN, ALDER

c. Predictors: (Constant), SØSKEN, KJØNN, ALDER, HØYDE, IQ

d. Predictors: (Constant), SØSKEN, KJØNN, ALDER, HØYDE, IQ, FØDSELSVEKT, TILKNYTNING

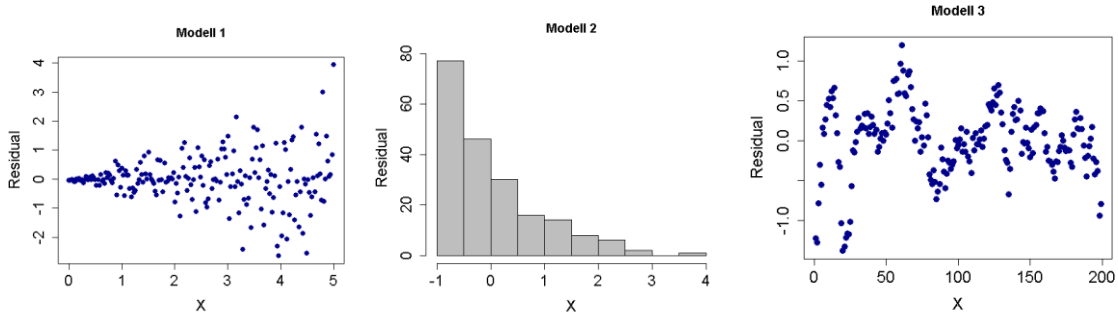
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	190,830	1	190,830	10,606	,001[b]
	Residual	5361,885	298	17,993		
	Total	5552,715	299			
2	Regression	681,026	3	227,009	13,793	,000[c]
	Residual	4871,689	296	16,458		
	Total	5552,715	299			
3	Regression	683,569	5	136,714	8,255	,000[d]
	Residual	4869,146	294	16,562		
	Total	5552,715	299			
4	Regression	953,773	7	136,253	8,651	,000[e]
	Residual	4598,942	292	15,750		
	Total	5552,715	299			

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95,0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	12,207	,432		28,232	,000	11,356	13,058
	SØSKEN	-,588	,181	-,185	-3,257	,001	-,943	-,233
2	(Constant)	13,254	,538		24,652	,000	12,196	14,312
	SØSKEN	-,251	,184	-,079	-1,365	,173	-,614	,111
	ALDER	-,333	,062	-,311	-5,358	,000	-,455	-,211
	KJØNN	,478	,470	,055	1,018	,310	-,446	1,403
3	(Constant)	11,892	3,756		3,166	,002	4,499	19,285
	SØSKEN	-,255	,186	-,080	-1,371	,171	-,620	,111
	ALDER	-,331	,063	-,309	-5,285	,000	-,454	-,208
	KJØNN	,477	,471	,055	1,012	,312	-,451	1,405
	IQ	,003	,024	,007	,124	,901	-,044	,050
	HØYDE	,008	,022	,020	,372	,710	-,035	,052
4	(Constant)	21,793	4,442		4,906	,000	13,051	30,535
	SØSKEN	-,137	,184	-,043	[redacted]		[redacted]	
	ALDER	-,340	,061	-,317	-5,545	[redacted]		
	KJØNN	,417	[redacted]				-,490	1,325
	IQ	,005	[redacted]	,011	,209	[redacted]		
	HØYDE	,011	,022	,027	,508	,612	-,031	,053
	FØDSELSVEKT	-,002	,001	-,179	-3,336	,001	-,004	-,001
	TILKNYTNING	-,292	[redacted]	-,139	[redacted]			-,068

a. Dependent Variable: SJENERT


Modell 1
Residual
X
Modell 2
Residual
X
Modell 3
Residual
X

Formelark for PSY2014

Gjennomsnitt: $\bar{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$

Varians: $s_X^2 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})^2}{n-1}$

Standardavvik: $s_X = \sqrt{s_X^2}$

Kovarians: $s_{XY} = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{n-1}$

Pearson Korrelasjon: $r = \frac{s_{XY}}{s_X s_Y}$

Minste kvadraters estimater i bivariat regresjon. $\hat{b}_0 = \bar{Y} - \hat{b}_1 \cdot \bar{X}$ $\hat{b}_1 = \frac{\sum_{i=1}^{n}(X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sum_{i=1}^{n}(X_i - \bar{X})^2} = \frac{cov_{XY}}{s_X^2}$

Standardfeilen til estimatet av b_1 i en bivariat regresjon. $SE(\hat{b}_1) = \frac{s}{\sqrt{\sum(X_i - \bar{X})^2}}$ $s = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n-p-1}}$

Standardisert regresjonskoeffisient $\beta_i = b_i \frac{s_X}{s_Y}$

Sums of squares: $\sum(Y_i - \bar{Y})^2 = \sum(\hat{Y}_i - \bar{Y})^2 + \sum(Y_i - \hat{Y}_i)^2$

r^2: $r^2 = 1 - \frac{SS_{Residual}}{SS_{Total}}$ $Justert\ r^2 = 1 - \frac{(n-1)(1-r^2)}{n-p-1}$

Z-skåre: $Z = \frac{X - \mu}{\sigma_X}$

F-ratio: $F = \frac{MS_{Regression}}{MS_{Residual}}$, er i en multippel regresjonsanalyse fordelt F(df_1=p, df_2=n-p-1) under H_0.

T-test: $t = \frac{\hat{b}_i}{SE(\hat{b}_i)}$, er i en multippel regresjonsanalyse fordelt t(df=n-p-1) under H_0.

Kji-kvadrat: $\chi^2 = \sum \frac{(O-E)^2}{E}$, fordelt $\chi^2(df = (Rader - 1)(Kol - 1))\ under\ H_0$ $E_{kol\ i,radj} = \frac{R_j \times C_i}{n}$

$$standardisert\ \chi^2\ residual = \frac{O - E}{\sqrt{E\ (1 - rad\ proporsjon)(1 - kolonne\ proporsjon)}}$$

Enveis Anova (mellom-gruppe design):

$SS_{between}$: $SS_b = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(\bar{y}_j - \bar{y})^2 = \sum_{j=1}^{g} n_j(\bar{y}_j - \bar{y})^2$ $df_b = g - 1$

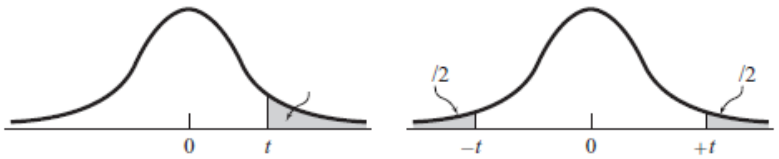
SS_{within} : $SS_w = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(y_{ij} - \bar{y}_j)^2$ $df_w = n - g$

For "standardfeilen" (SE) til en differanse mellom to gjennomsnitt bruker vi:

$SE_{diff} = \sqrt{\frac{2\ MSS_w}{n}}$ (der *n* er antall personer innad i hver gruppe).

$t = \frac{x_1 - x_2}{SE_{diff}}$, med frihetsgrader (df) fra MSSw

Appendix *t*: Percentage Points of the *t* Distribution



One-tailed test Two-tailed test

	Level of Significance for One-Tailed Test								
	0.25	*0.20*	*0.15*	*0.10*	*0.05*	*0.025*	*0.01*	*0.005*	*0.0005*
	Level of Significance for Two-Tailed Test								
df	*0.50*	*0.40*	*0.30*	*0.20*	*0.10*	*0.05*	*0.02*	*0.01*	*0.001*
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.620
2	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.599
3	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	12.924
4	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	5.408
8	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.768
24	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
50	0.679	0.849	1.047	1.299	1.676	2.009	2.403	2.678	3.496
100	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.390
∞	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.291

Source: The entries in this table were computed by the author.

Question 4
Attached

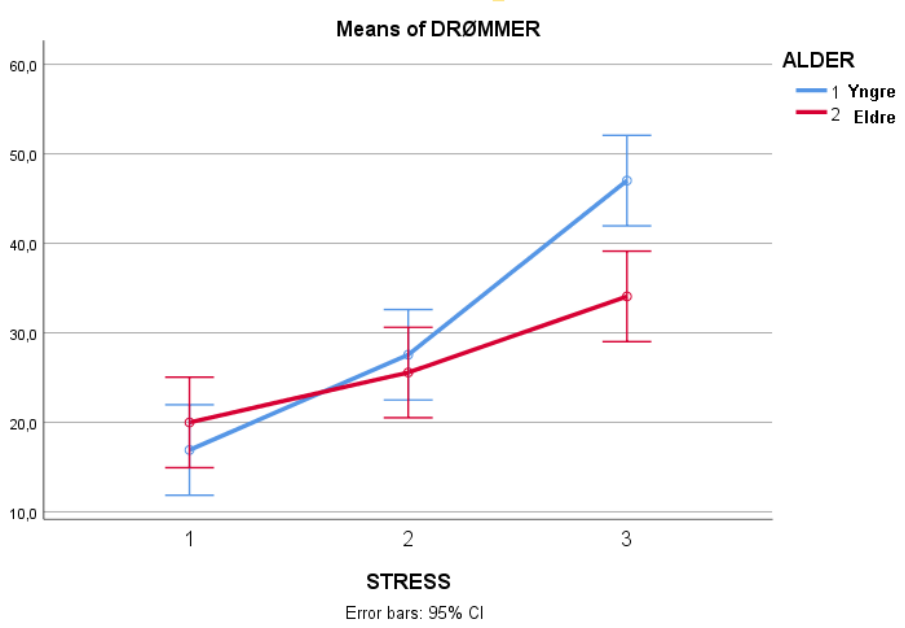
Utskrift til oppgave 2a

ANOVA

DRØMMER

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4995,466	[redacted]	[redacted]	[redacted]	,000
Within Groups	4338,206	57	76,109		
Total	9333,673	59			

Utskrift til oppgave 2b



Kilde	SS	df	MSS	F	p
STRESS	4995.466	2	2497.7	39.289	<0.001
ALDER	234.027	1	234.0	3.681	0.060
STRESS * ALDER	671.176	2	335.6	5.279	0.001
Error	3433.004	54	63.6		
Total	9333.673	59			

Formelark for PSY2014

Gjennomsnitt: $\bar{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$

Varians: $s_X^2 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})^2}{n-1}$

Standardavvik: $s_X = \sqrt{s_X^2}$

Kovarians: $s_{XY} = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{n-1}$

Pearson Korrelasjon: $r = \frac{s_{XY}}{s_X s_Y}$

Minste kvadraters estimater i bivariat regresjon. $\hat{b}_0 = \bar{Y} - \hat{b}_1 \cdot \bar{X}$ $\hat{b}_1 = \frac{\sum_{i=1}^{n}(X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sum_{i=1}^{n}(X_i - \bar{X})^2} = \frac{cov_{XY}}{s_X^2}$

Standardfeilen til estimatet av b_1 i en bivariat regresjon. $SE(\hat{b}_1) = \frac{s}{\sqrt{\sum(X_i - \bar{X})^2}}$ $s = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n-p-1}}$

Standardisert regresjonskoeffisient $\beta_i = b_i \frac{s_X}{s_Y}$

Sums of squares: $\sum(Y_i - \bar{Y})^2 = \sum(\hat{Y}_i - \bar{Y})^2 + \sum(Y_i - \hat{Y}_i)^2$

r^2: $r^2 = 1 - \frac{SS_{Residual}}{SS_{Total}}$ $Justert\ r^2 = 1 - \frac{(n-1)(1-r^2)}{n-p-1}$

Z-skåre: $Z = \frac{X - \mu}{\sigma_X}$

F-ratio: $F = \frac{MS_{Regression}}{MS_{Residual}}$, er i en multippel regresjonsanalyse fordelt F(df_1=p, df_2=n-p-1) under H_0.

T-test: $t = \frac{\hat{b}_i}{SE(\hat{b}_i)}$, er i en multippel regresjonsanalyse fordelt t(df=n-p-1) under H_0.

Kji-kvadrat: $\chi^2 = \sum \frac{(O-E)^2}{E}$, fordelt $\chi^2(df = (Rader - 1)(Kol - 1))\ under\ H_0$ $E_{kol\ i,radj} = \frac{R_j \times C_i}{n}$

$$standardisert\ \chi^2\ residual = \frac{O - E}{\sqrt{E\ (1 - rad\ proporsjon)(1 - kolonne\ proporsjon)}}$$

Enveis Anova (mellom-gruppe design):

$SS_{between}$: $SS_b = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(\bar{y}_j - \bar{y})^2 = \sum_{j=1}^{g} n_j(\bar{y}_j - \bar{y})^2$ $df_b = g - 1$

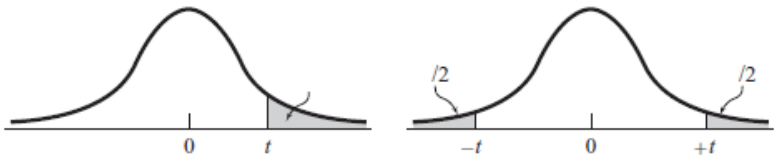
SS_{within} : $SS_w = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(y_{ij} - \bar{y}_j)^2$ $df_w = n - g$

For "standardfeilen" (SE) til en differanse mellom to gjennomsnitt bruker vi:

$SE_{diff} = \sqrt{\frac{2\ MSS_w}{n}}$ (der *n* er antall personer innad i hver gruppe).

$t = \frac{x_1 - x_2}{SE_{diff}}$, med frihetsgrader (df) fra MSSw

Appendix *t*: Percentage Points of the *t* Distribution



One-tailed test Two-tailed test

	Level of Significance for One-Tailed Test								
	0.25	*0.20*	*0.15*	*0.10*	*0.05*	*0.025*	*0.01*	*0.005*	*0.0005*
	Level of Significance for Two-Tailed Test								
df	*0.50*	*0.40*	*0.30*	*0.20*	*0.10*	*0.05*	*0.02*	*0.01*	*0.001*
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.620
2	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.599
3	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	12.924
4	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	5.408
8	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.768
24	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
50	0.679	0.849	1.047	1.299	1.676	2.009	2.403	2.678	3.496
100	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.390
∞	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.291

Source: The entries in this table were computed by the author.

Question 4
Attached

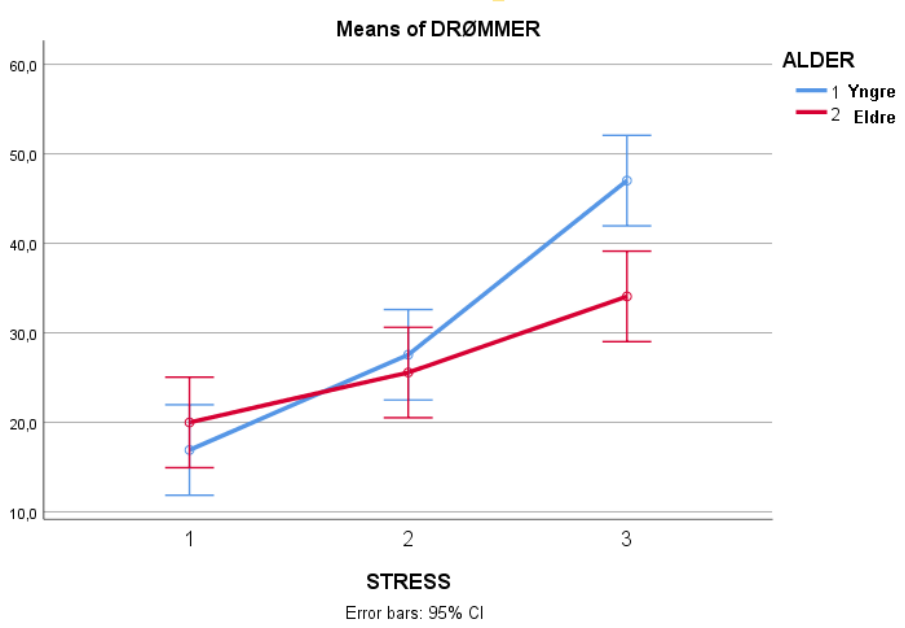
Utskrift til oppgave 2a

ANOVA

DRØMMER

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4995,466	[redacted]	[redacted]	[redacted]	,000
Within Groups	4338,206	57	76,109		
Total	9333,673	59			

Utskrift til oppgave 2b



Kilde	SS	df	MSS	F	p
STRESS	4995.466	2	2497.7	39.289	<0.001
ALDER	234.027	1	234.0	3.681	0.060
STRESS * ALDER	671.176	2	335.6	5.279	0.001
Error	3433.004	54	63.6		
Total	9333.673	59			

Formelark for PSY2014

Gjennomsnitt: $\bar{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$

Varians: $s_X^2 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})^2}{n-1}$

Standardavvik: $s_X = \sqrt{s_X^2}$

Kovarians: $s_{XY} = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{n-1}$

Pearson Korrelasjon: $r = \frac{s_{XY}}{s_X s_Y}$

Minste kvadraters estimater i bivariat regresjon. $\hat{b}_0 = \bar{Y} - \hat{b}_1 \cdot \bar{X}$ $\hat{b}_1 = \frac{\sum_{i=1}^{n}(X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sum_{i=1}^{n}(X_i - \bar{X})^2} = \frac{cov_{XY}}{s_X^2}$

Standardfeilen til estimatet av b_1 i en bivariat regresjon. $SE(\hat{b}_1) = \frac{s}{\sqrt{\sum(X_i - \bar{X})^2}}$ $s = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n-p-1}}$

Standardisert regresjonskoeffisient $\beta_i = b_i \frac{s_X}{s_Y}$

Sums of squares: $\sum(Y_i - \bar{Y})^2 = \sum(\hat{Y}_i - \bar{Y})^2 + \sum(Y_i - \hat{Y}_i)^2$

r^2: $r^2 = 1 - \frac{SS_{Residual}}{SS_{Total}}$ $Justert\ r^2 = 1 - \frac{(n-1)(1-r^2)}{n-p-1}$

Z-skåre: $Z = \frac{X - \mu}{\sigma_X}$

F-ratio: $F = \frac{MS_{Regression}}{MS_{Residual}}$, er i en multippel regresjonsanalyse fordelt F(df_1=p, df_2=n-p-1) under H_0.

T-test: $t = \frac{\hat{b}_i}{SE(\hat{b}_i)}$, er i en multippel regresjonsanalyse fordelt t(df=n-p-1) under H_0.

Kji-kvadrat: $\chi^2 = \sum \frac{(O-E)^2}{E}$, fordelt $\chi^2(df = (Rader - 1)(Kol - 1))\ under\ H_0$ $E_{kol\ i,radj} = \frac{R_j \times C_i}{n}$

$$standardisert\ \chi^2\ residual = \frac{O - E}{\sqrt{E\ (1 - rad\ proporsjon)(1 - kolonne\ proporsjon)}}$$

Enveis Anova (mellom-gruppe design):

$SS_{between}$: $SS_b = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(\bar{y}_j - \bar{y})^2 = \sum_{j=1}^{g} n_j(\bar{y}_j - \bar{y})^2$ $df_b = g - 1$

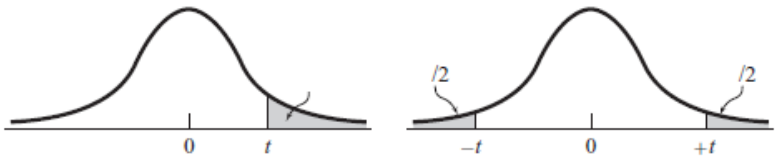
SS_{within} : $SS_w = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(y_{ij} - \bar{y}_j)^2$ $df_w = n - g$

For "standardfeilen" (SE) til en differanse mellom to gjennomsnitt bruker vi:

$SE_{diff} = \sqrt{\frac{2\ MSS_w}{n}}$ (der *n* er antall personer innad i hver gruppe).

$t = \frac{x_1 - x_2}{SE_{diff}}$, med frihetsgrader (df) fra MSSw

Appendix *t*: Percentage Points of the *t* Distribution



One-tailed test Two-tailed test

	Level of Significance for One-Tailed Test								
	0.25	*0.20*	*0.15*	*0.10*	*0.05*	*0.025*	*0.01*	*0.005*	*0.0005*
	Level of Significance for Two-Tailed Test								
df	*0.50*	*0.40*	*0.30*	*0.20*	*0.10*	*0.05*	*0.02*	*0.01*	*0.001*
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.620
2	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.599
3	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	12.924
4	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	5.408
8	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.768
24	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
50	0.679	0.849	1.047	1.299	1.676	2.009	2.403	2.678	3.496
100	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.390
∞	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.291

Source: The entries in this table were computed by the author.

Question 5
Attached

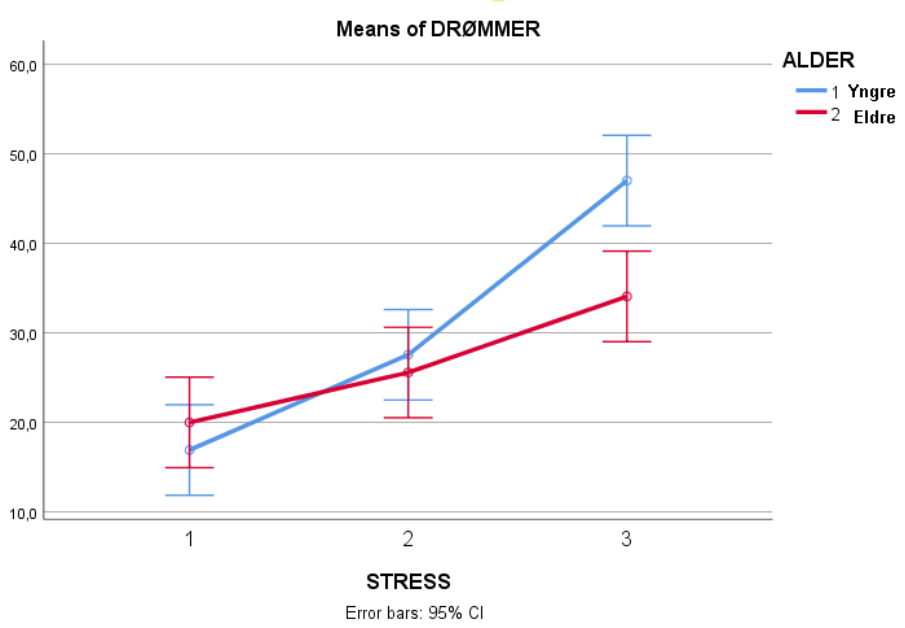
Utskrift til oppgave 2a

ANOVA

DRØMMER

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4995,466	[redacted]	[redacted]	[redacted]	,000
Within Groups	4338,206	57	76,109		
Total	9333,673	59			

Utskrift til oppgave 2b



Kilde	SS	df	MSS	F	p
STRESS	4995.466	2	2497.7	39.289	<0.001
ALDER	234.027	1	234.0	3.681	0.060
STRESS * ALDER	671.176	2	335.6	5.279	0.001
Error	3433.004	54	63.6		
Total	9333.673	59			

Formelark for PSY2014

Gjennomsnitt: $\bar{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$

Varians: $s_X^2 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})^2}{n-1}$

Standardavvik: $s_X = \sqrt{s_X^2}$

Kovarians: $s_{XY} = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{n-1}$

Pearson Korrelasjon: $r = \frac{s_{XY}}{s_X s_Y}$

Minste kvadraters estimater i bivariat regresjon. $\hat{b}_0 = \bar{Y} - \hat{b}_1 \cdot \bar{X}$ $\hat{b}_1 = \frac{\sum_{i=1}^{n}(X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sum_{i=1}^{n}(X_i - \bar{X})^2} = \frac{cov_{XY}}{s_X^2}$

Standardfeilen til estimatet av b_1 i en bivariat regresjon. $SE(\hat{b}_1) = \frac{s}{\sqrt{\sum(X_i - \bar{X})^2}}$ $s = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n-p-1}}$

Standardisert regresjonskoeffisient $\beta_i = b_i \frac{s_X}{s_Y}$

Sums of squares: $\sum(Y_i - \bar{Y})^2 = \sum(\hat{Y}_i - \bar{Y})^2 + \sum(Y_i - \hat{Y}_i)^2$

r^2: $r^2 = 1 - \frac{SS_{Residual}}{SS_{Total}}$ $Justert\ r^2 = 1 - \frac{(n-1)(1-r^2)}{n-p-1}$

Z-skåre: $Z = \frac{X - \mu}{\sigma_X}$

F-ratio: $F = \frac{MS_{Regression}}{MS_{Residual}}$, er i en multippel regresjonsanalyse fordelt F(df_1=p, df_2=n-p-1) under H_0.

T-test: $t = \frac{\hat{b}_i}{SE(\hat{b}_i)}$, er i en multippel regresjonsanalyse fordelt t(df=n-p-1) under H_0.

Kji-kvadrat: $\chi^2 = \sum \frac{(O-E)^2}{E}$, fordelt $\chi^2(df = (Rader - 1)(Kol - 1))\ under\ H_0$ $E_{kol\ i,radj} = \frac{R_j \times C_i}{n}$

$$standardisert\ \chi^2\ residual = \frac{O - E}{\sqrt{E\ (1 - rad\ proporsjon)(1 - kolonne\ proporsjon)}}$$

Enveis Anova (mellom-gruppe design):

$SS_{between}$: $SS_b = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(\bar{y}_j - \bar{y})^2 = \sum_{j=1}^{g} n_j(\bar{y}_j - \bar{y})^2$ $df_b = g - 1$

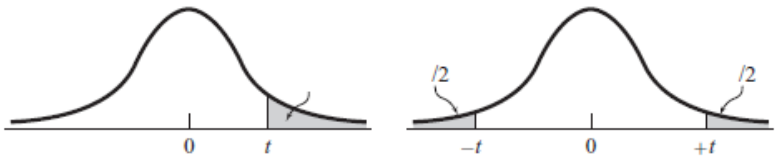
SS_{within} : $SS_w = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(y_{ij} - \bar{y}_j)^2$ $df_w = n - g$

For "standardfeilen" (SE) til en differanse mellom to gjennomsnitt bruker vi:

$SE_{diff} = \sqrt{\frac{2\ MSS_w}{n}}$ (der *n* er antall personer innad i hver gruppe).

$t = \frac{x_1 - x_2}{SE_{diff}}$, med frihetsgrader (df) fra MSSw

Appendix *t*: Percentage Points of the *t* Distribution



One-tailed test Two-tailed test

	Level of Significance for One-Tailed Test								
	0.25	*0.20*	*0.15*	*0.10*	*0.05*	*0.025*	*0.01*	*0.005*	*0.0005*
	Level of Significance for Two-Tailed Test								
df	*0.50*	*0.40*	*0.30*	*0.20*	*0.10*	*0.05*	*0.02*	*0.01*	*0.001*
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.620
2	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.599
3	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	12.924
4	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	5.408
8	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.768
24	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
50	0.679	0.849	1.047	1.299	1.676	2.009	2.403	2.678	3.496
100	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.390
∞	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.291

Source: The entries in this table were computed by the author.

Question 5
Attached

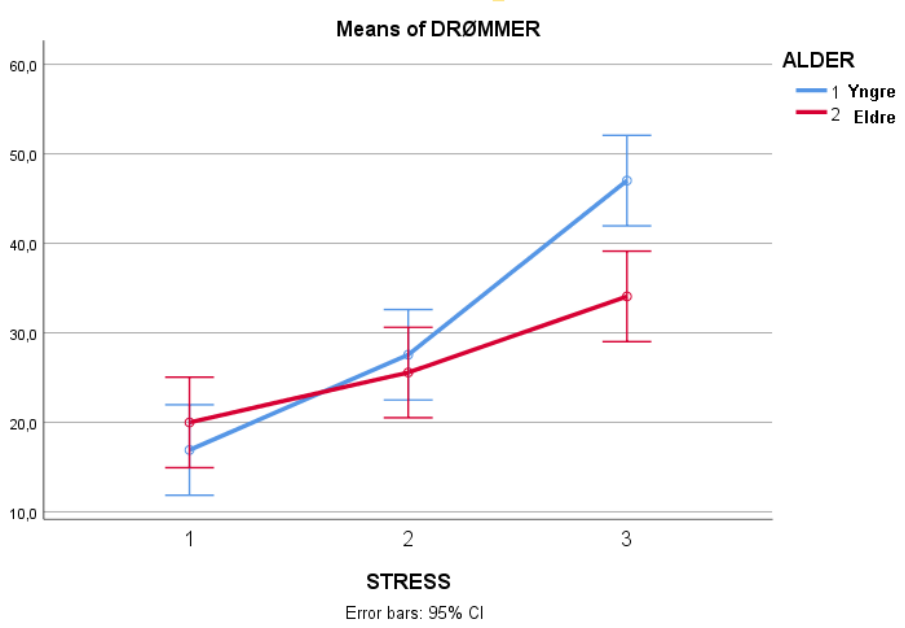
Utskrift til oppgave 2a

ANOVA

DRØMMER

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4995,466	[redacted]	[redacted]	[redacted]	,000
Within Groups	4338,206	57	76,109		
Total	9333,673	59			

Utskrift til oppgave 2b



Kilde	SS	df	MSS	F	p
STRESS	4995.466	2	2497.7	39.289	<0.001
ALDER	234.027	1	234.0	3.681	0.060
STRESS * ALDER	671.176	2	335.6	5.279	0.001
Error	3433.004	54	63.6		
Total	9333.673	59			

Formelark for PSY2014

Gjennomsnitt: $\bar{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$

Varians: $s_X^2 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})^2}{n-1}$

Standardavvik: $s_X = \sqrt{s_X^2}$

Kovarians: $s_{XY} = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{n-1}$

Pearson Korrelasjon: $r = \frac{s_{XY}}{s_X s_Y}$

Minste kvadraters estimater i bivariat regresjon. $\hat{b}_0 = \bar{Y} - \hat{b}_1 \cdot \bar{X}$ $\hat{b}_1 = \frac{\sum_{i=1}^{n}(X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sum_{i=1}^{n}(X_i - \bar{X})^2} = \frac{cov_{XY}}{s_X^2}$

Standardfeilen til estimatet av b_1 i en bivariat regresjon. $SE(\hat{b}_1) = \frac{s}{\sqrt{\sum(X_i - \bar{X})^2}}$ $s = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n-p-1}}$

Standardisert regresjonskoeffisient $\beta_i = b_i \frac{s_X}{s_Y}$

Sums of squares: $\sum(Y_i - \bar{Y})^2 = \sum(\hat{Y}_i - \bar{Y})^2 + \sum(Y_i - \hat{Y}_i)^2$

r^2: $r^2 = 1 - \frac{SS_{Residual}}{SS_{Total}}$ $Justert\ r^2 = 1 - \frac{(n-1)(1-r^2)}{n-p-1}$

Z-skåre: $Z = \frac{X - \mu}{\sigma_X}$

F-ratio: $F = \frac{MS_{Regression}}{MS_{Residual}}$, er i en multippel regresjonsanalyse fordelt F(df_1=p, df_2=n-p-1) under H_0.

T-test: $t = \frac{\hat{b}_i}{SE(\hat{b}_i)}$, er i en multippel regresjonsanalyse fordelt t(df=n-p-1) under H_0.

Kji-kvadrat: $\chi^2 = \sum \frac{(O-E)^2}{E}$, fordelt $\chi^2(df = (Rader - 1)(Kol - 1))\ under\ H_0$ $E_{kol\ i,radj} = \frac{R_j \times C_i}{n}$

$$standardisert\ \chi^2\ residual = \frac{O - E}{\sqrt{E\ (1 - rad\ proporsjon)(1 - kolonne\ proporsjon)}}$$

Enveis Anova (mellom-gruppe design):

$SS_{between}$: $SS_b = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(\bar{y}_j - \bar{y})^2 = \sum_{j=1}^{g} n_j(\bar{y}_j - \bar{y})^2$ $df_b = g - 1$

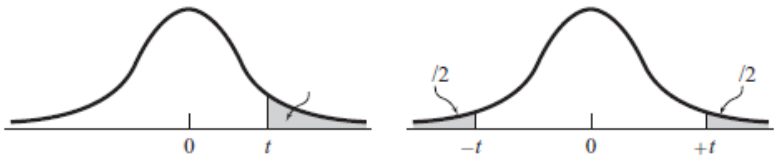
SS_{within} : $SS_w = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(y_{ij} - \bar{y}_j)^2$ $df_w = n - g$

For "standardfeilen" (SE) til en differanse mellom to gjennomsnitt bruker vi:

$SE_{diff} = \sqrt{\frac{2\ MSS_w}{n}}$ (der *n* er antall personer innad i hver gruppe).

$t = \frac{x_1 - x_2}{SE_{diff}}$, med frihetsgrader (df) fra MSSw

Appendix *t*: Percentage Points of the *t* Distribution



One-tailed test Two-tailed test

	Level of Significance for One-Tailed Test								
	0.25	*0.20*	*0.15*	*0.10*	*0.05*	*0.025*	*0.01*	*0.005*	*0.0005*
	Level of Significance for Two-Tailed Test								
df	*0.50*	*0.40*	*0.30*	*0.20*	*0.10*	*0.05*	*0.02*	*0.01*	*0.001*
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.620
2	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.599
3	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	12.924
4	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	5.408
8	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.768
24	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
50	0.679	0.849	1.047	1.299	1.676	2.009	2.403	2.678	3.496
100	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.390
∞	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.291

Source: The entries in this table were computed by the author.

Question 6
Attached

KJÆLEDYR * FILM Crosstabulation

			FILM			
			Komedie	Thriller	Drama	Total
KJÆLEDYR	Katt	Count	49	28	39	116
		Expected Count	37,6	39,9	38,6	116,0
		Residual	11,4	-11,9	,4	
		Standardized Residual	1,9	-1,9	,1	
	Hund	Count	36	55	43	134
		Expected Count	43,4	46,1	44,5	134,0
		Residual	-7,4	8,9	-1,5	
		Standardized Residual	-1,1	1,3	-,2	
	Hamster	Count	30	39	36	105
		Expected Count	34,0	36,1	34,9	105,0
		Residual	-4,0	2,9	1,1	
		Standardized Residual	-,7	,5	,2	
Total		Count	115	122	118	355
		Expected Count	115,0	122,0	118,0	355,0

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10,809[a]	[redacted]	
Likelihood Ratio	10,907		
Linear-by-Linear Association	1,783	1	,182
N of Valid Cases	355		

Kji-kvadrat tabell:

df	0.995	0.990	0.975	0.950	0.900	0.750	0.500	0.250	0.100	0.050	0.025	0.010	0.005
1	0.00	0.00	0.00	0.00	0.02	0.10	0.45	1.32	2.71	3.84	5.02	6.63	7.88
2	0.01	0.02	0.05	0.10	0.21	0.58	1.39	2.77	4.61	5.99	7.38	9.21	10.60
3	0.07	0.11	0.22	0.35	0.58	1.21	2.37	4.11	6.25	7.82	9.35	11.35	12.84
4	0.21	0.30	0.48	0.71	1.06	1.92	3.36	5.39	7.78	9.49	11.14	13.28	14.86
5	0.41	0.55	0.83	1.15	1.61	2.67	4.35	6.63	9.24	11.07	12.83	15.09	16.75
6	0.68	0.87	1.24	1.64	2.20	3.45	5.35	7.84	10.64	12.59	14.45	16.81	18.55

Formelark for PSY2014

Gjennomsnitt: $\bar{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$

Varians: $s_X^2 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})^2}{n-1}$

Standardavvik: $s_X = \sqrt{s_X^2}$

Kovarians: $s_{XY} = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{n-1}$

Pearson Korrelasjon: $r = \frac{s_{XY}}{s_X s_Y}$

Minste kvadraters estimater i bivariat regresjon. $\hat{b}_0 = \bar{Y} - \hat{b}_1 \cdot \bar{X}$ $\hat{b}_1 = \frac{\sum_{i=1}^{n}(X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sum_{i=1}^{n}(X_i - \bar{X})^2} = \frac{cov_{XY}}{s_X^2}$

Standardfeilen til estimatet av b_1 i en bivariat regresjon. $SE(\hat{b}_1) = \frac{s}{\sqrt{\sum(X_i - \bar{X})^2}}$ $s = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n-p-1}}$

Standardisert regresjonskoeffisient $\beta_i = b_i \frac{s_X}{s_Y}$

Sums of squares: $\sum(Y_i - \bar{Y})^2 = \sum(\hat{Y}_i - \bar{Y})^2 + \sum(Y_i - \hat{Y}_i)^2$

r^2: $r^2 = 1 - \frac{SS_{Residual}}{SS_{Total}}$ $Justert\ r^2 = 1 - \frac{(n-1)(1-r^2)}{n-p-1}$

Z-skåre: $Z = \frac{X - \mu}{\sigma_X}$

F-ratio: $F = \frac{MS_{Regression}}{MS_{Residual}}$, er i en multippel regresjonsanalyse fordelt F(df_1=p, df_2=n-p-1) under H_0.

T-test: $t = \frac{\hat{b}_i}{SE(\hat{b}_i)}$, er i en multippel regresjonsanalyse fordelt t(df=n-p-1) under H_0.

Kji-kvadrat: $\chi^2 = \sum \frac{(O-E)^2}{E}$, fordelt $\chi^2(df = (Rader - 1)(Kol - 1))\ under\ H_0$ $E_{kol\ i,radj} = \frac{R_j \times C_i}{n}$

$$standardisert\ \chi^2\ residual = \frac{O - E}{\sqrt{E\ (1 - rad\ proporsjon)(1 - kolonne\ proporsjon)}}$$

Enveis Anova (mellom-gruppe design):

$SS_{between}$: $SS_b = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(\bar{y}_j - \bar{y})^2 = \sum_{j=1}^{g} n_j(\bar{y}_j - \bar{y})^2$ $df_b = g - 1$

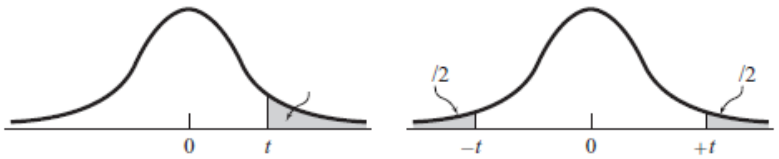
SS_{within} : $SS_w = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(y_{ij} - \bar{y}_j)^2$ $df_w = n - g$

For "standardfeilen" (SE) til en differanse mellom to gjennomsnitt bruker vi:

$SE_{diff} = \sqrt{\frac{2\ MSS_w}{n}}$ (der *n* er antall personer innad i hver gruppe).

$t = \frac{x_1 - x_2}{SE_{diff}}$, med frihetsgrader (df) fra MSSw

Appendix *t*: Percentage Points of the *t* Distribution



One-tailed test Two-tailed test

	Level of Significance for One-Tailed Test								
	0.25	*0.20*	*0.15*	*0.10*	*0.05*	*0.025*	*0.01*	*0.005*	*0.0005*
	Level of Significance for Two-Tailed Test								
df	*0.50*	*0.40*	*0.30*	*0.20*	*0.10*	*0.05*	*0.02*	*0.01*	*0.001*
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.620
2	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.599
3	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	12.924
4	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	5.408
8	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.768
24	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
50	0.679	0.849	1.047	1.299	1.676	2.009	2.403	2.678	3.496
100	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.390
∞	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.291

Source: The entries in this table were computed by the author.

Question 6
Attached

KJÆLEDYR * FILM Crosstabulation

			FILM			
			Komedie	Thriller	Drama	Total
KJÆLEDYR	Katt	Count	49	28	39	116
		Expected Count	37,6	39,9	38,6	116,0
		Residual	11,4	-11,9	,4	
		Standardized Residual	1,9	-1,9	,1	
	Hund	Count	36	55	43	134
		Expected Count	43,4	46,1	44,5	134,0
		Residual	-7,4	8,9	-1,5	
		Standardized Residual	-1,1	1,3	-,2	
	Hamster	Count	30	39	36	105
		Expected Count	34,0	36,1	34,9	105,0
		Residual	-4,0	2,9	1,1	
		Standardized Residual	-,7	,5	,2	
Total		Count	115	122	118	355
		Expected Count	115,0	122,0	118,0	355,0

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	10,809[a]	[redacted]	
Likelihood Ratio	10,907		
Linear-by-Linear Association	1,783	1	,182
N of Valid Cases	355		

Kji-kvadrat tabell:

df	0.995	0.990	0.975	0.950	0.900	0.750	0.500	0.250	0.100	0.050	0.025	0.010	0.005
1	0.00	0.00	0.00	0.00	0.02	0.10	0.45	1.32	2.71	3.84	5.02	6.63	7.88
2	0.01	0.02	0.05	0.10	0.21	0.58	1.39	2.77	4.61	5.99	7.38	9.21	10.60
3	0.07	0.11	0.22	0.35	0.58	1.21	2.37	4.11	6.25	7.82	9.35	11.35	12.84
4	0.21	0.30	0.48	0.71	1.06	1.92	3.36	5.39	7.78	9.49	11.14	13.28	14.86
5	0.41	0.55	0.83	1.15	1.61	2.67	4.35	6.63	9.24	11.07	12.83	15.09	16.75
6	0.68	0.87	1.24	1.64	2.20	3.45	5.35	7.84	10.64	12.59	14.45	16.81	18.55

Formelark for PSY2014

Gjennomsnitt: $\bar{X} = \frac{1}{n} \sum_{i=1}^{n} X_i$

Varians: $s_X^2 = \frac{\sum_{i=1}^{n}(X_i - \bar{X})^2}{n-1}$

Standardavvik: $s_X = \sqrt{s_X^2}$

Kovarians: $s_{XY} = \frac{\sum_{i=1}^{n}(X_i - \bar{X})(Y_i - \bar{Y})}{n-1}$

Pearson Korrelasjon: $r = \frac{s_{XY}}{s_X s_Y}$

Minste kvadraters estimater i bivariat regresjon. $\hat{b}_0 = \bar{Y} - \hat{b}_1 \cdot \bar{X}$ $\hat{b}_1 = \frac{\sum_{i=1}^{n}(X_i - \bar{X}) \cdot (Y_i - \bar{Y})}{\sum_{i=1}^{n}(X_i - \bar{X})^2} = \frac{cov_{XY}}{s_X^2}$

Standardfeilen til estimatet av b_1 i en bivariat regresjon. $SE(\hat{b}_1) = \frac{s}{\sqrt{\sum(X_i - \bar{X})^2}}$ $s = \sqrt{\frac{\sum(Y - \hat{Y})^2}{n-p-1}}$

Standardisert regresjonskoeffisient $\beta_i = b_i \frac{s_X}{s_Y}$

Sums of squares: $\sum(Y_i - \bar{Y})^2 = \sum(\hat{Y}_i - \bar{Y})^2 + \sum(Y_i - \hat{Y}_i)^2$

r^2: $r^2 = 1 - \frac{SS_{Residual}}{SS_{Total}}$ $Justert\ r^2 = 1 - \frac{(n-1)(1-r^2)}{n-p-1}$

Z-skåre: $Z = \frac{X - \mu}{\sigma_X}$

F-ratio: $F = \frac{MS_{Regression}}{MS_{Residual}}$, er i en multippel regresjonsanalyse fordelt F(df_1=p, df_2=n-p-1) under H_0.

T-test: $t = \frac{\hat{b}_i}{SE(\hat{b}_i)}$, er i en multippel regresjonsanalyse fordelt t(df=n-p-1) under H_0.

Kji-kvadrat: $\chi^2 = \sum \frac{(O-E)^2}{E}$, fordelt $\chi^2(df = (Rader - 1)(Kol - 1))\ under\ H_0$ $E_{kol\ i,radj} = \frac{R_j \times C_i}{n}$

$$standardisert\ \chi^2\ residual = \frac{O - E}{\sqrt{E\ (1 - rad\ proporsjon)(1 - kolonne\ proporsjon)}}$$

Enveis Anova (mellom-gruppe design):

$SS_{between}$: $SS_b = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(\bar{y}_j - \bar{y})^2 = \sum_{j=1}^{g} n_j(\bar{y}_j - \bar{y})^2$ $df_b = g - 1$

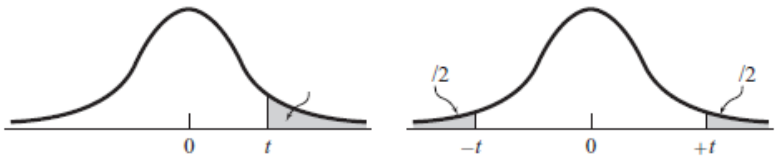
SS_{within} : $SS_w = \sum_{j=1}^{g}\sum_{i=1}^{n_j}(y_{ij} - \bar{y}_j)^2$ $df_w = n - g$

For "standardfeilen" (SE) til en differanse mellom to gjennomsnitt bruker vi:

$SE_{diff} = \sqrt{\frac{2\ MSS_w}{n}}$ (der *n* er antall personer innad i hver gruppe).

$t = \frac{x_1 - x_2}{SE_{diff}}$, med frihetsgrader (df) fra MSSw

Appendix *t*: Percentage Points of the *t* Distribution



One-tailed test Two-tailed test

	Level of Significance for One-Tailed Test								
	0.25	*0.20*	*0.15*	*0.10*	*0.05*	*0.025*	*0.01*	*0.005*	*0.0005*
	Level of Significance for Two-Tailed Test								
df	*0.50*	*0.40*	*0.30*	*0.20*	*0.10*	*0.05*	*0.02*	*0.01*	*0.001*
1	1.000	1.376	1.963	3.078	6.314	12.706	31.821	63.657	636.620
2	0.816	1.061	1.386	1.886	2.920	4.303	6.965	9.925	31.599
3	0.765	0.978	1.250	1.638	2.353	3.182	4.541	5.841	12.924
4	0.741	0.941	1.190	1.533	2.132	2.776	3.747	4.604	8.610
5	0.727	0.920	1.156	1.476	2.015	2.571	3.365	4.032	6.869
6	0.718	0.906	1.134	1.440	1.943	2.447	3.143	3.707	5.959
7	0.711	0.896	1.119	1.415	1.895	2.365	2.998	3.499	5.408
8	0.706	0.889	1.108	1.397	1.860	2.306	2.896	3.355	5.041
9	0.703	0.883	1.100	1.383	1.833	2.262	2.821	3.250	4.781
10	0.700	0.879	1.093	1.372	1.812	2.228	2.764	3.169	4.587
11	0.697	0.876	1.088	1.363	1.796	2.201	2.718	3.106	4.437
12	0.695	0.873	1.083	1.356	1.782	2.179	2.681	3.055	4.318
13	0.694	0.870	1.079	1.350	1.771	2.160	2.650	3.012	4.221
14	0.692	0.868	1.076	1.345	1.761	2.145	2.624	2.977	4.140
15	0.691	0.866	1.074	1.341	1.753	2.131	2.602	2.947	4.073
16	0.690	0.865	1.071	1.337	1.746	2.120	2.583	2.921	4.015
17	0.689	0.863	1.069	1.333	1.740	2.110	2.567	2.898	3.965
18	0.688	0.862	1.067	1.330	1.734	2.101	2.552	2.878	3.922
19	0.688	0.861	1.066	1.328	1.729	2.093	2.539	2.861	3.883
20	0.687	0.860	1.064	1.325	1.725	2.086	2.528	2.845	3.850
21	0.686	0.859	1.063	1.323	1.721	2.080	2.518	2.831	3.819
22	0.686	0.858	1.061	1.321	1.717	2.074	2.508	2.819	3.792
23	0.685	0.858	1.060	1.319	1.714	2.069	2.500	2.807	3.768
24	0.685	0.857	1.059	1.318	1.711	2.064	2.492	2.797	3.745
25	0.684	0.856	1.058	1.316	1.708	2.060	2.485	2.787	3.725
26	0.684	0.856	1.058	1.315	1.706	2.056	2.479	2.779	3.707
27	0.684	0.855	1.057	1.314	1.703	2.052	2.473	2.771	3.690
28	0.683	0.855	1.056	1.313	1.701	2.048	2.467	2.763	3.674
29	0.683	0.854	1.055	1.311	1.699	2.045	2.462	2.756	3.659
30	0.683	0.854	1.055	1.310	1.697	2.042	2.457	2.750	3.646
40	0.681	0.851	1.050	1.303	1.684	2.021	2.423	2.704	3.551
50	0.679	0.849	1.047	1.299	1.676	2.009	2.403	2.678	3.496
100	0.677	0.845	1.042	1.290	1.660	1.984	2.364	2.626	3.390
∞	0.674	0.842	1.036	1.282	1.645	1.960	2.326	2.576	3.291

Source: The entries in this table were computed by the author.