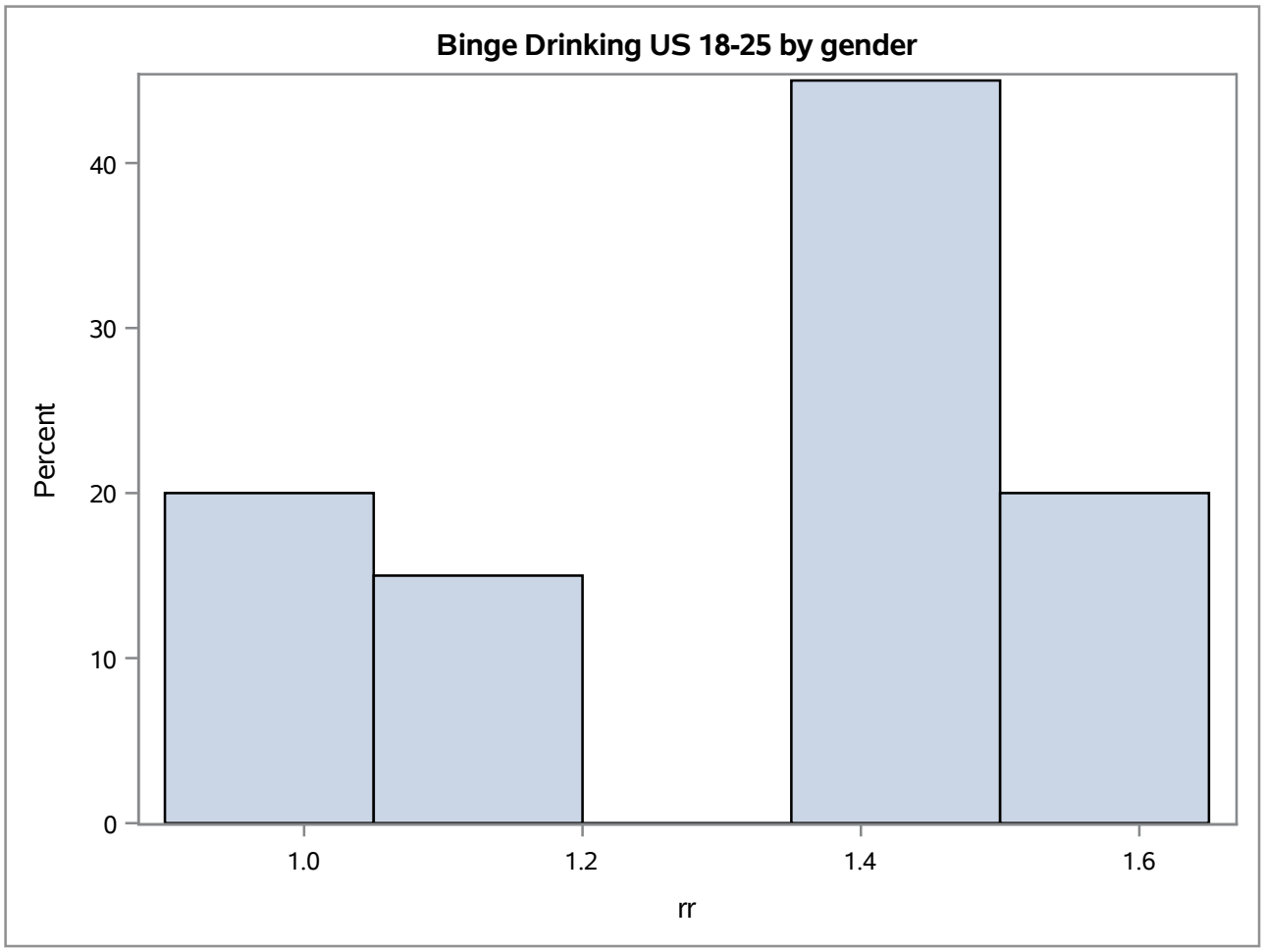
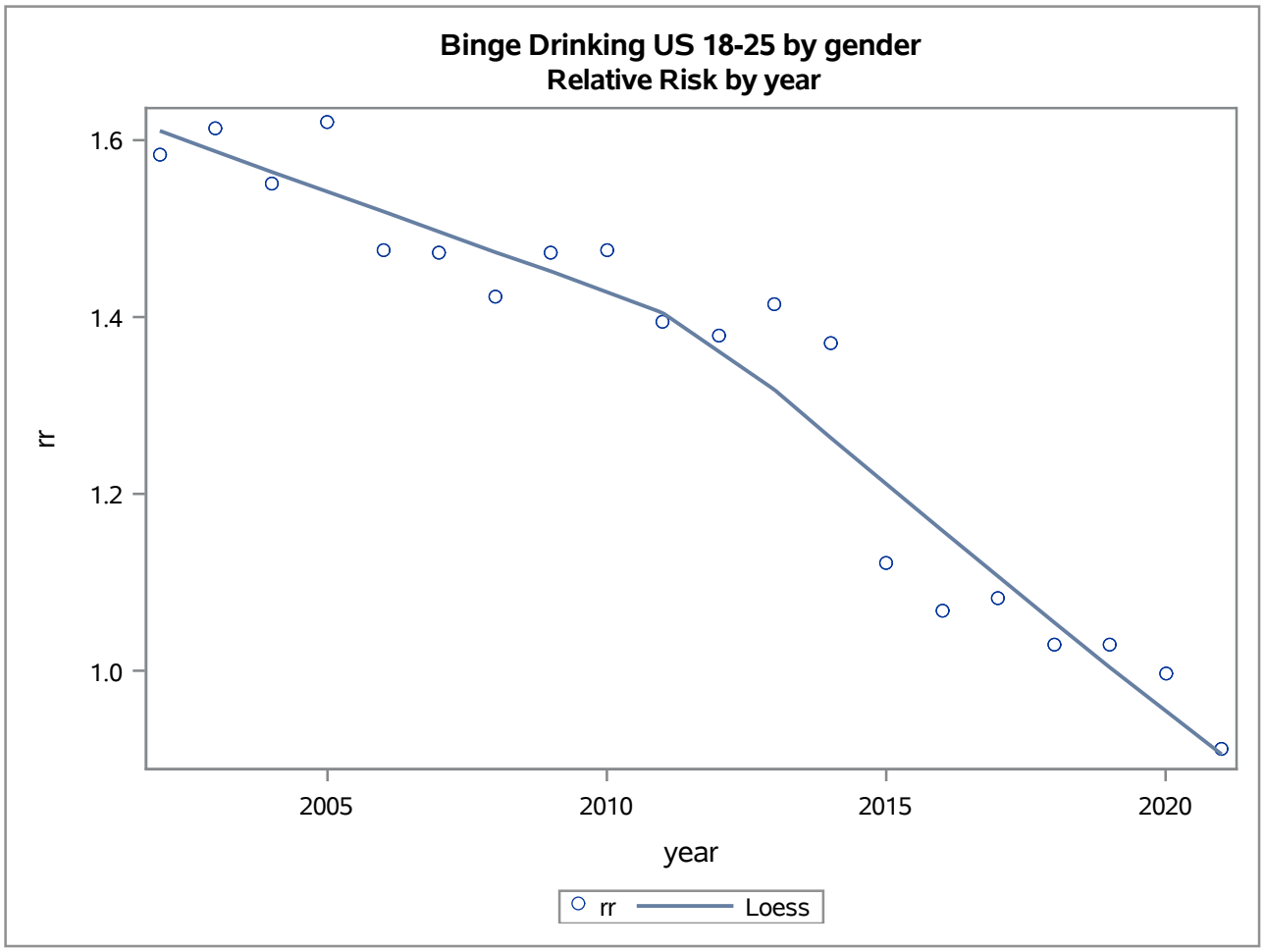

Binge Drinking US 18-25 by gender
Percent
40
30
20
10
0
1.0
1.2
1.4
1.6
rr


Binge Drinking US 18-25 by gender
Relative Risk by year
rr
1.6
1.4
1.2
1.0
2005
2010
2015
2020
year
rr
Loess

The GLM Procedure

Number of Observations Read	20
Number of Observations Used	20

Binge Drinking US 18-25 by gender
Relative Risk by year

The GLM Procedure

Dependent Variable: rr

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	0.92340713	0.92340713	163.08	<.0001
Error	18	0.10192166	0.00566231		
Corrected Total	19	1.02532878			

R-Square	Coeff Var	Root MSE	rr Mean
0.900596	5.681887	0.075248	1.324355

Source	DF	Type I SS	Mean Square	F Value	Pr > F
year	1	0.92340713	0.92340713	163.08	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
year	1	0.92340713	0.92340713	163.08	<.0001

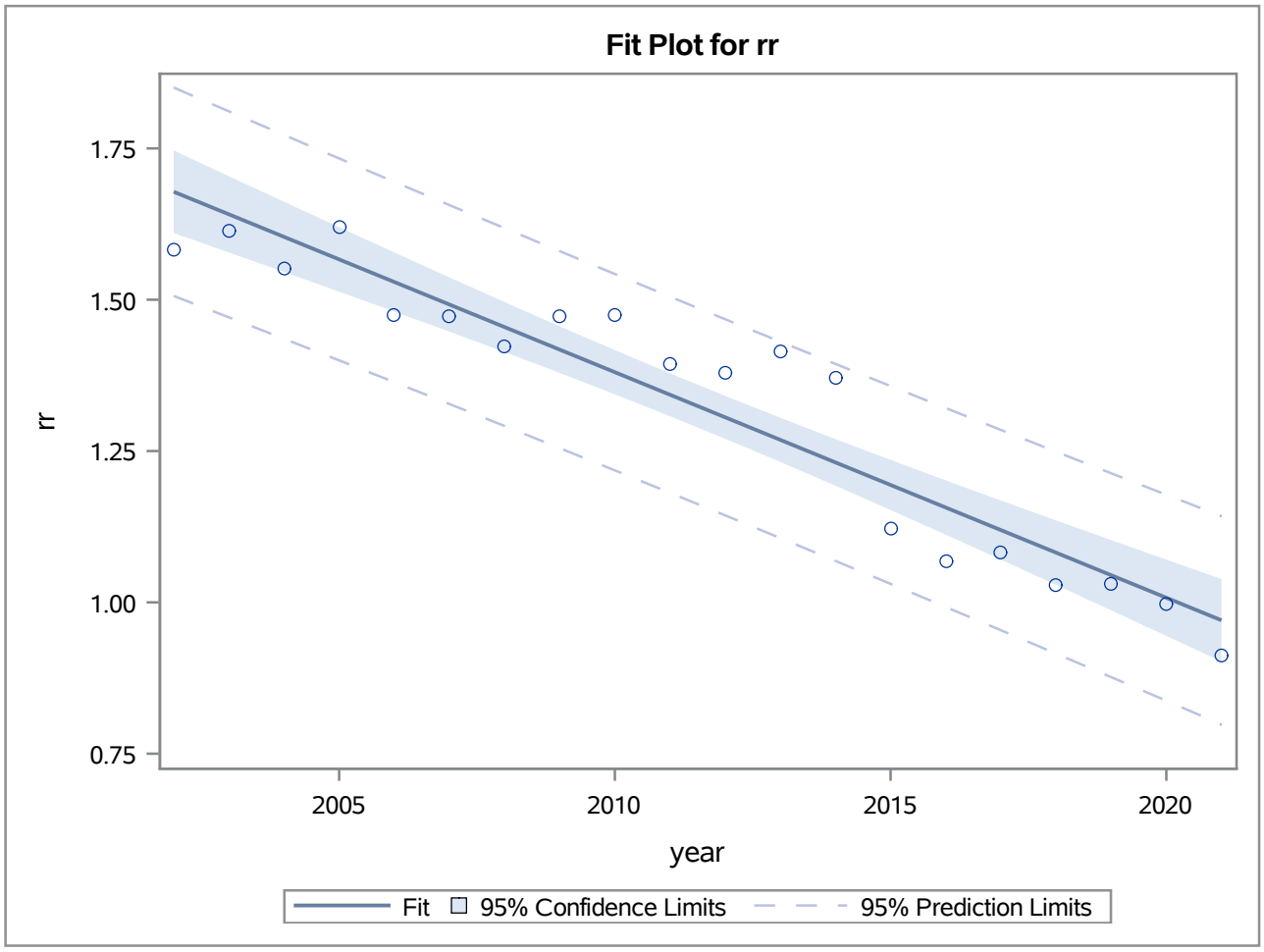
Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	76.28025527	5.86959292	13.00	<.0001
year	-0.03726368	0.00291801	-12.77	<.0001

The GLM Procedure

Observation		Observed	Predicted	Residual	95% Confidence Limits for Mean Predicted Value	
1		1.58359621	1.67835995	-0.09476373	1.61023133	1.74648856
2		1.61320755	1.64109626	-0.02788871	1.57812791	1.70406461
3		1.55108359	1.60383258	-0.05274899	1.54583530	1.66182986
4		1.62068966	1.56656889	0.05412076	1.51330050	1.61983728
5		1.47507331	1.52930521	-0.05423190	1.48045314	1.57815728
6		1.47337278	1.49204153	-0.01866874	1.44720076	1.53688229
7		1.42352941	1.45477784	-0.03124843	1.41342534	1.49613034
8		1.47337278	1.41751416	0.05585862	1.37898454	1.45604377
9		1.47546012	1.38025047	0.09520965	1.34372379	1.41677716
10		1.39457831	1.34298679	0.05159152	1.30750394	1.37846964
11		1.37951807	1.30572311	0.07379497	1.27024025	1.34120596
12		1.41401274	1.26845942	0.14555332	1.23193274	1.30498611
13		1.37106918	1.23119574	0.13987345	1.19266612	1.26972535
14		1.12228261	1.19393205	-0.07164944	1.15257955	1.23528456
15		1.06738544	1.15666837	-0.08928292	1.11182761	1.20150913
16		1.08192090	1.11940469	-0.03748378	1.07055262	1.16825675
17		1.02906977	1.08214100	-0.05307123	1.02887261	1.13540939
18		1.02958580	1.04487732	-0.01529152	0.98688004	1.10287460
19		0.99681529	1.00761363	-0.01079835	0.94464528	1.07058199
20		0.91147541	0.97034995	-0.05887454	0.90222133	1.03847857

Sum of Residuals	-0.00000000
Sum of Squared Residuals	0.10192166
Sum of Squared Residuals - Error SS	-0.00000000
PRESS Statistic	0.12195524
First Order Autocorrelation	0.45756322
Durbin-Watson D	0.96275647

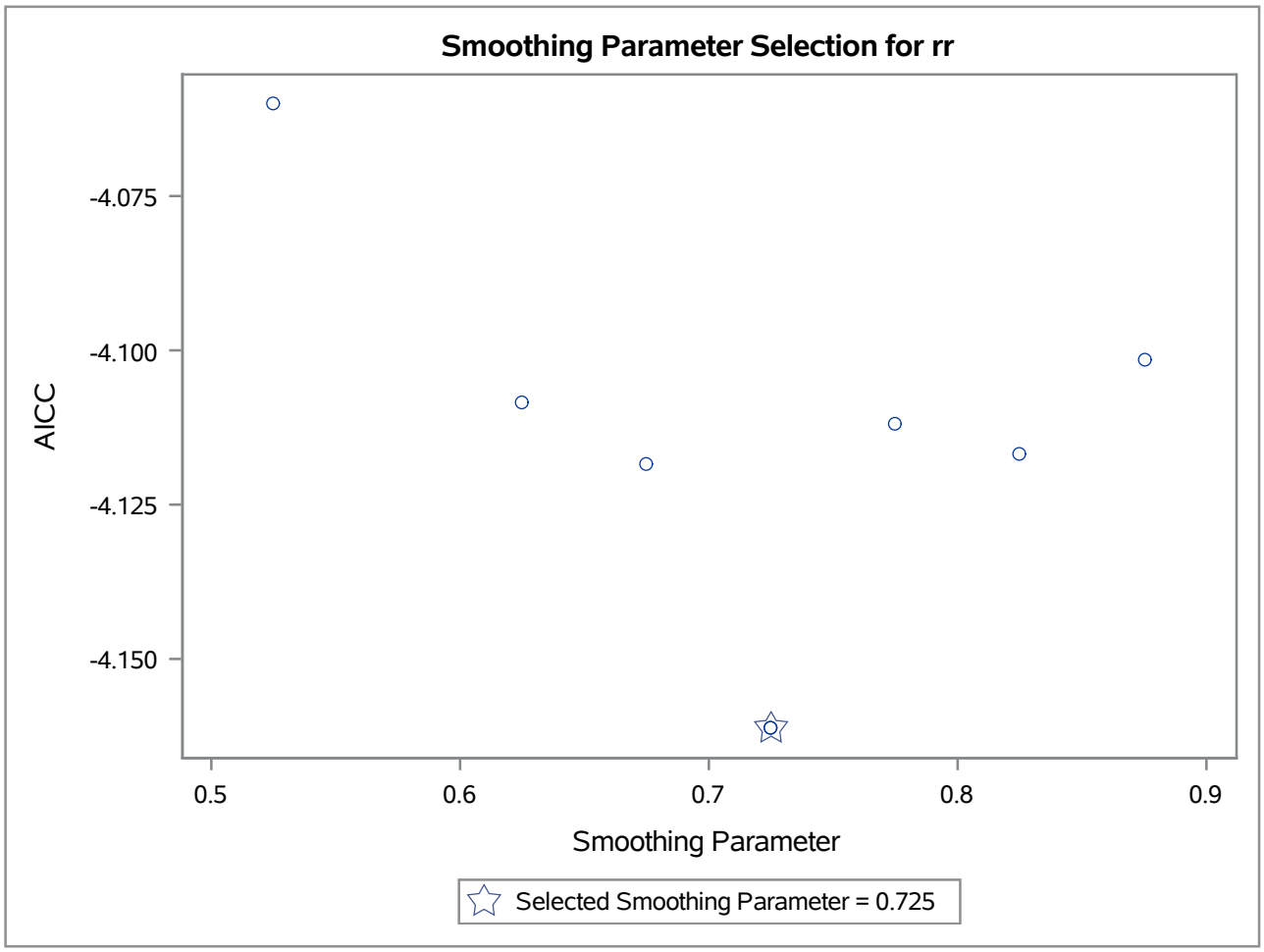
The GLM Procedure



The LOESS Procedure

Independent Variable Scaling	
Scaling applied: None	
Statistic	year
Minimum Value	2002
Maximum Value	2021

The LOESS Procedure
Dependent Variable: rr



Optimal Smoothing Criterion	
AICC	Smoothing Parameter
-4.16120	0.72500

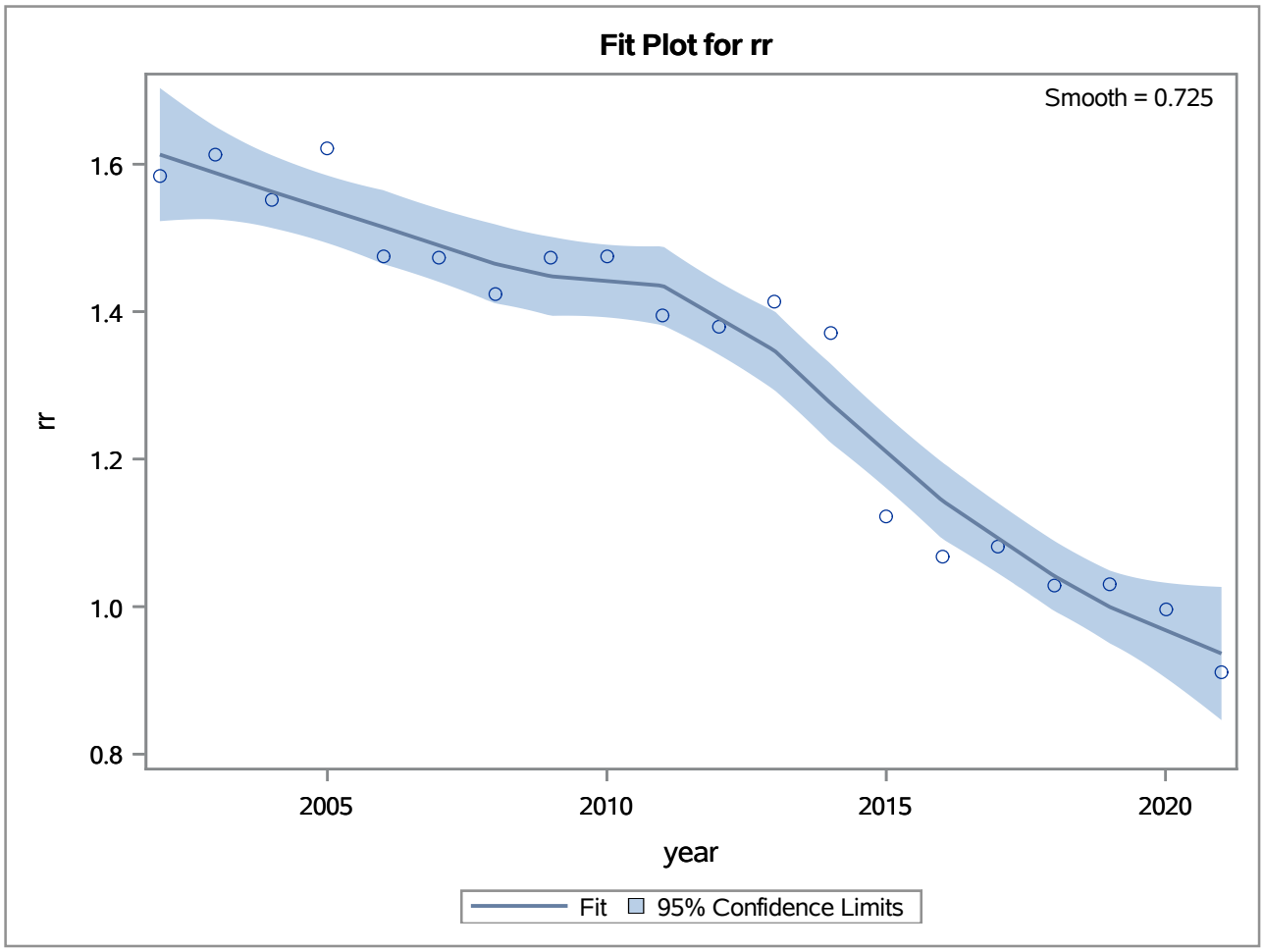
Binge Drinking US 18-25 by gender
Relative Risk by year

The LOESS Procedure
Selected Smoothing Parameter: 0.725
Dependent Variable: rr

Fit Summary	
Fit Method	kd Tree
Blending	Linear
Number of Observations	20
Number of Fitting Points	13
kd Tree Bucket Size	2
Degree of Local Polynomials	2
Smoothing Parameter	0.72500
Points in Local Neighborhood	14
Residual Sum of Squares	0.04514
Trace[L]	5.04145
GCV	0.00020175
AICC	-4.16120
AICC1	-82.72021
Delta1	14.52998
Delta2	14.21814
Equivalent Number of Parameters	4.61289
Lookup Degrees of Freedom	14.84867
Residual Standard Error	0.05574

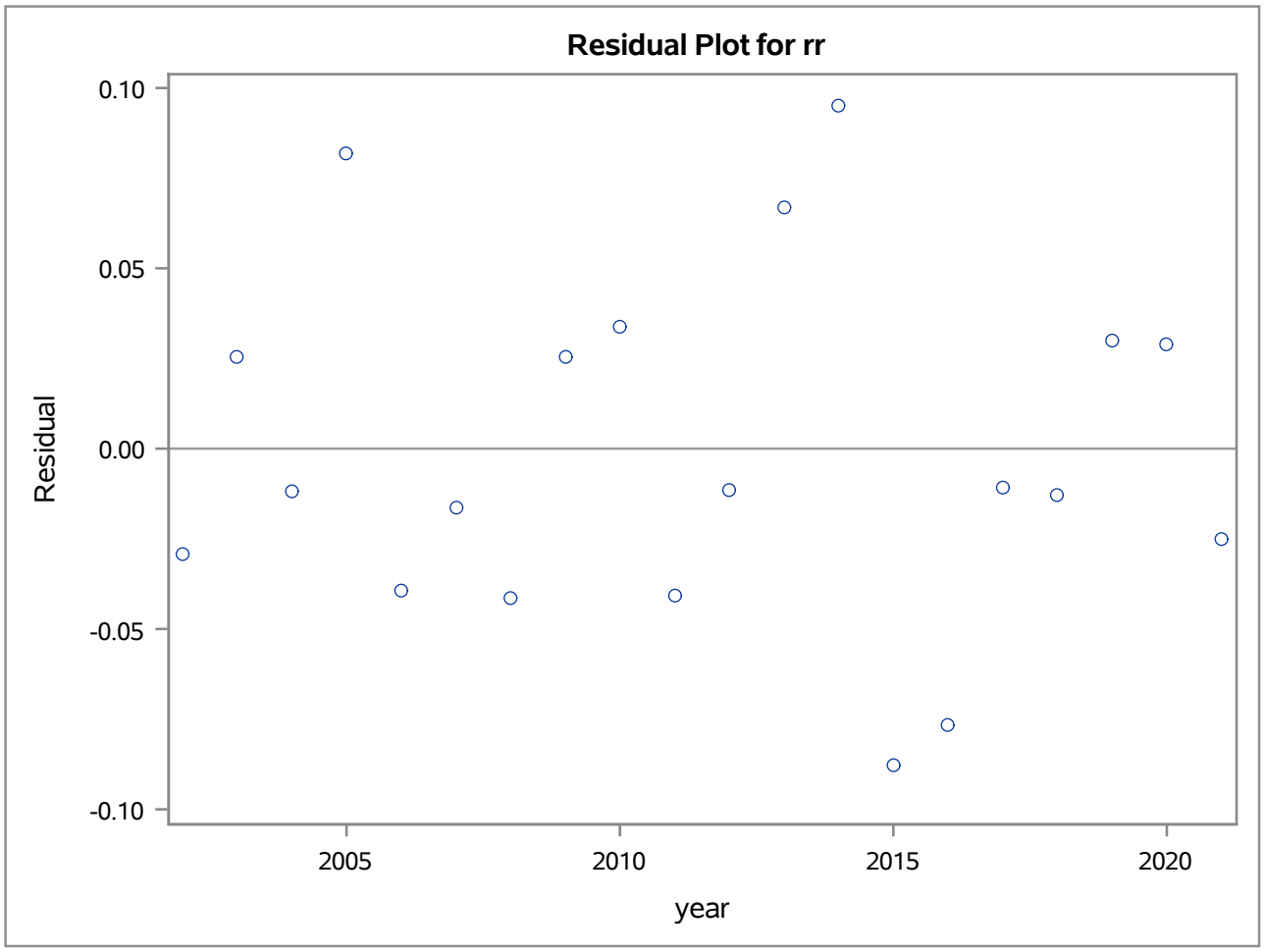
Binge Drinking US 18-25 by gender
Relative Risk by year

The LOESS Procedure
Selected Smoothing Parameter: 0.725
Dependent Variable: rr



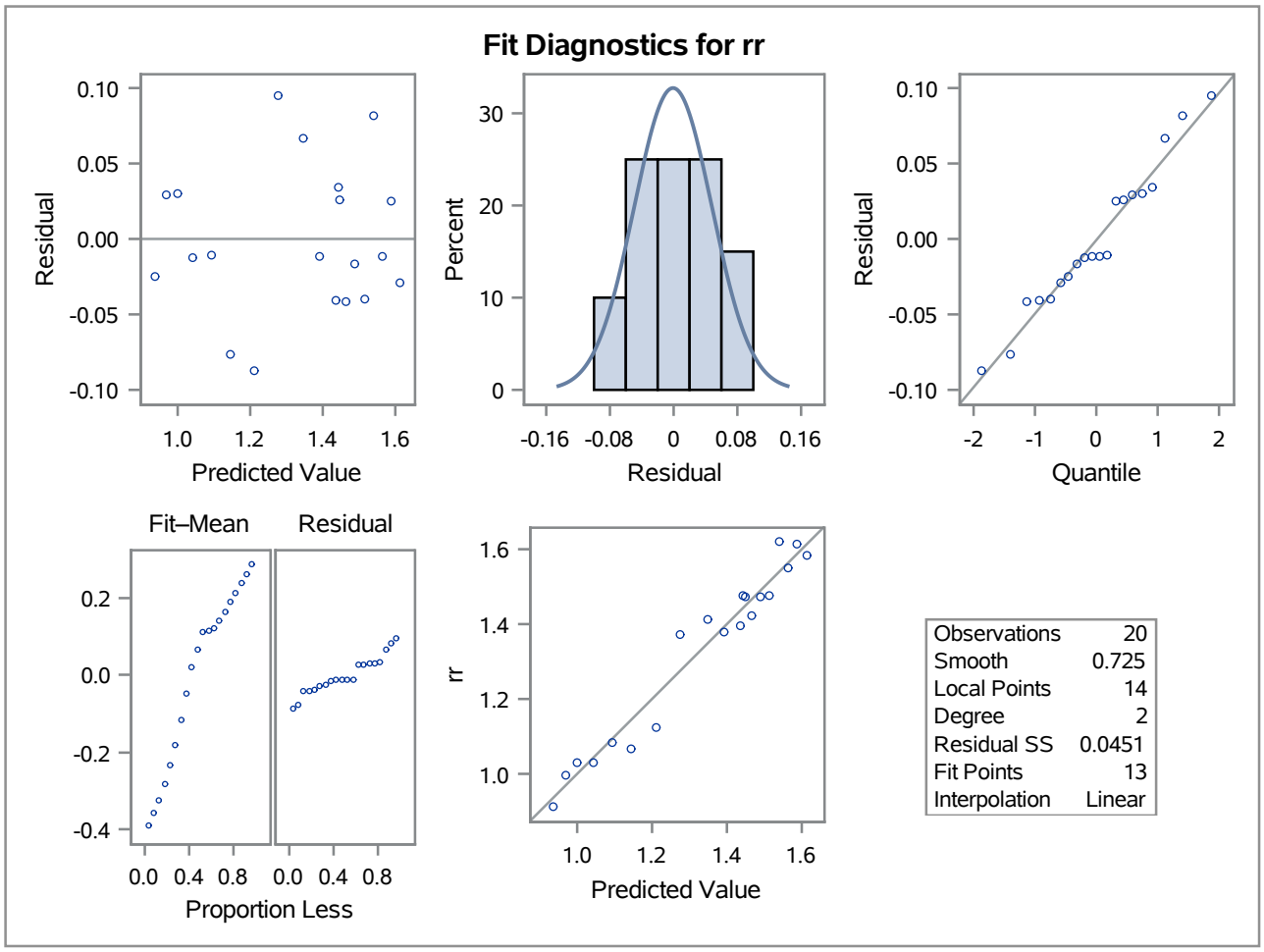
Binge Drinking US 18-25 by gender
Relative Risk by year

The LOESS Procedure
Selected Smoothing Parameter: 0.725
Dependent Variable: rr



Binge Drinking US 18-25 by gender
Relative Risk by year

The LOESS Procedure
Selected Smoothing Parameter: 0.725
Dependent Variable: rr

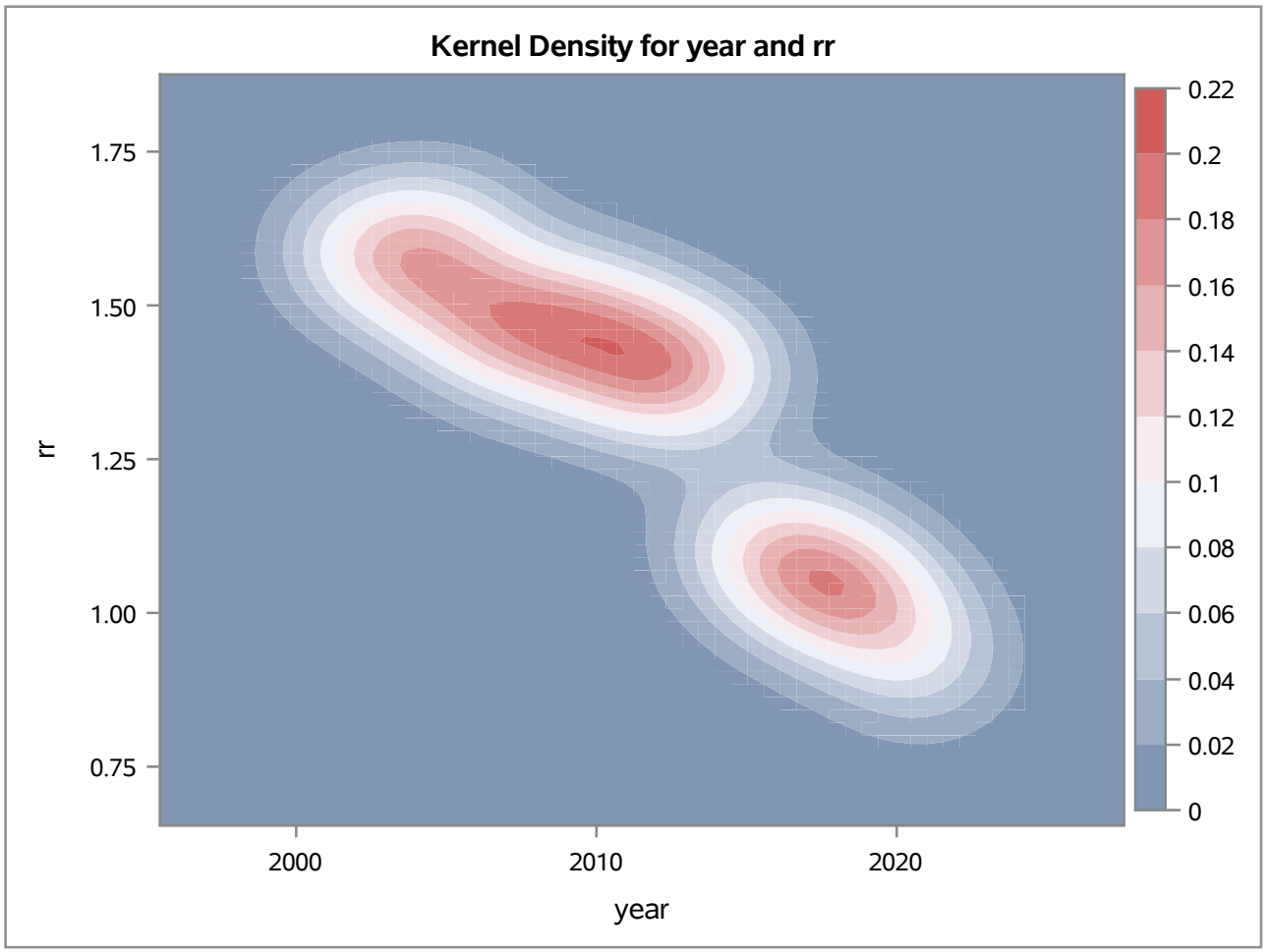


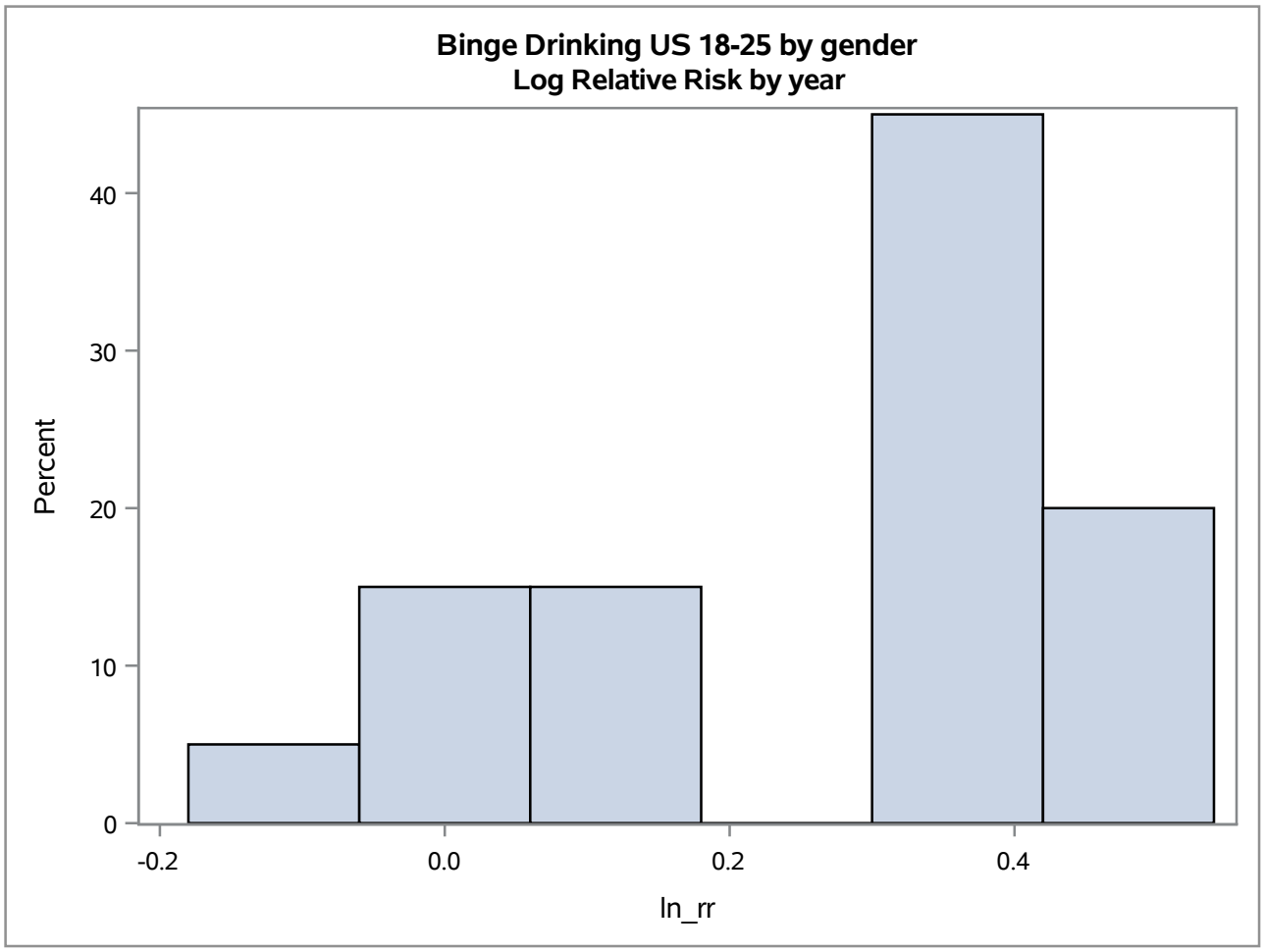
Binge Drinking US 18-25 by gender
Relative Risk by year

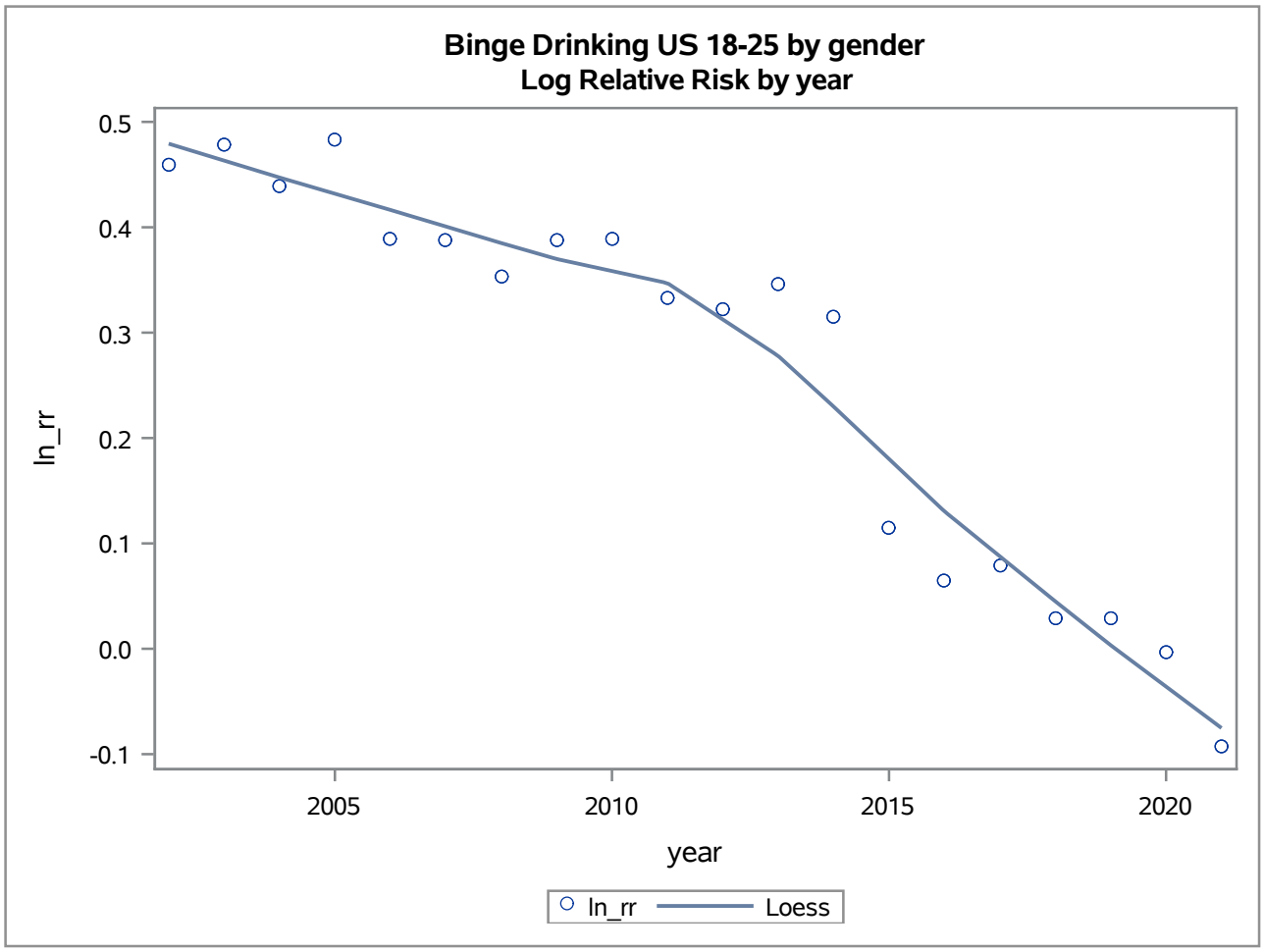
The KDE Procedure

Inputs	
Data Set	WORK.BINGE
Number of Observations Used	20
Variable 1	year
Variable 2	rr
Bandwidth Method	Simple Normal Reference

Controls		
	year	**rr**
Grid Points	60	60
Lower Grid Limit	1995.5	0.6566
Upper Grid Limit	2027.5	1.8756
Bandwidth Multiplier	0.6	0.6




Binge Drinking US 18-25 by gender
Log Relative Risk by year
Percent
40
30
20
10
0
-0.2
0.0
0.2
0.4
ln_rr


Binge Drinking US 18-25 by gender
Log Relative Risk by year
ln_rr
0.5
0.4
0.3
0.2
0.1
0.0
-0.1
2005
2010
2015
2020
year
ln_rr
Loess

The GLM Procedure

Number of Observations Read	20
Number of Observations Used	20

Binge Drinking US 18-25 by gender
Log Relative Risk by year

The GLM Procedure

Dependent Variable: ln_rr

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	1	0.57781396	0.57781396	134.93	<.0001
Error	18	0.07708341	0.00428241		
Corrected Total	19	0.65489737			

R-Square	Coeff Var	Root MSE	ln_rr Mean
0.882297	24.67926	0.065440	0.265162

Source	DF	Type I SS	Mean Square	F Value	Pr > F
year	1	0.57781396	0.57781396	134.93	<.0001

Source	DF	Type III SS	Mean Square	F Value	Pr > F
year	1	0.57781396	0.57781396	134.93	<.0001

Parameter	Estimate	Standard Error	t Value	Pr > |t|
Intercept	59.55813597	5.10452344	11.67	<.0001
year	-0.02947699	0.00253766	-11.62	<.0001

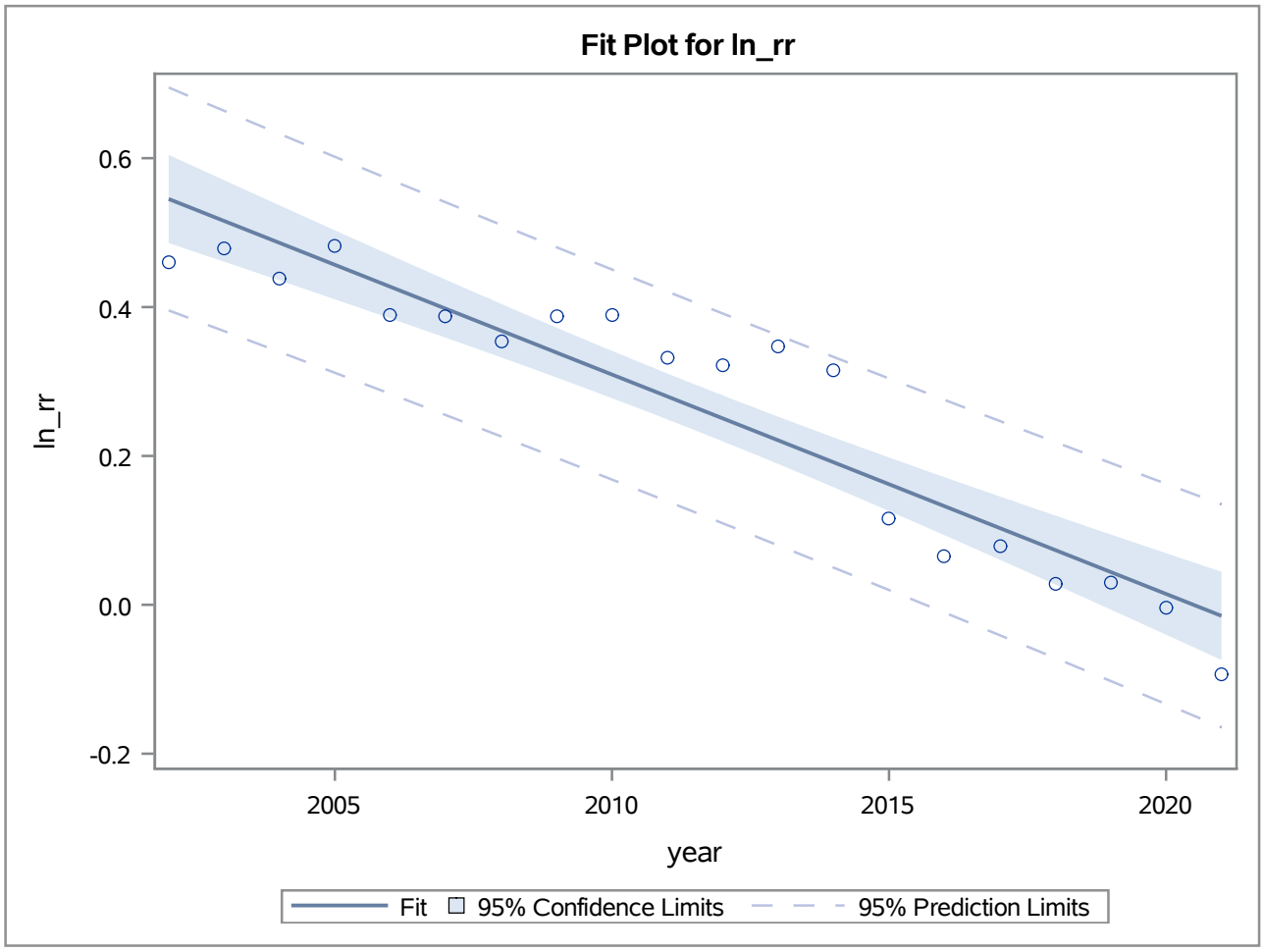
The GLM Procedure

Observation	Observed	Predicted	Residual	95% Confidence Limits for Mean Predicted Value	
1	0.45969835	0.54519387	-0.08549553	0.48594545	0.60444230
2	0.47822446	0.51571688	-0.03749242	0.46095611	0.57047765
3	0.43895378	0.48623988	-0.04728611	0.43580224	0.53667753
4	0.48285177	0.45676289	0.02608888	0.41043775	0.50308804
5	0.38870769	0.42728590	-0.03857820	0.38480143	0.46977036
6	0.38755418	0.39780890	-0.01025472	0.35881289	0.43680492
7	0.35313929	0.36833191	-0.01519262	0.33236948	0.40429434
8	0.38755418	0.33885491	0.04869927	0.30534743	0.37236240
9	0.38896989	0.30937792	0.07959197	0.27761229	0.34114355
10	0.33259209	0.27990093	0.05269116	0.24904307	0.31075878
11	0.32173422	0.25042393	0.07131028	0.21956608	0.28128179
12	0.34643158	0.22094694	0.12548464	0.18918131	0.25271257
13	0.31559086	0.19146994	0.12412092	0.15796246	0.22497743
14	0.11536465	0.16199295	-0.04662830	0.12603052	0.19795538
15	0.06521215	0.13251596	-0.06730381	0.09351994	0.17151197
16	0.07873808	0.10303896	-0.02430089	0.06055449	0.14552343
17	0.02865526	0.07356197	-0.04490671	0.02723682	0.11988711
18	0.02915658	0.04408497	-0.01492839	-0.00635267	0.09452262
19	-0.00318980	0.01460798	-0.01779778	-0.04015279	0.06936875
20	-0.09269066	-0.01486901	-0.07782165	-0.07411744	0.04437941

Sum of Residuals	-0.00000000
Sum of Squared Residuals	0.07708341
Sum of Squared Residuals - Error SS	0.00000000
PRESS Statistic	0.09355343
First Order Autocorrelation	0.53577409
Durbin-Watson D	0.75505919

Binge Drinking US 18-25 by gender
Log Relative Risk by year

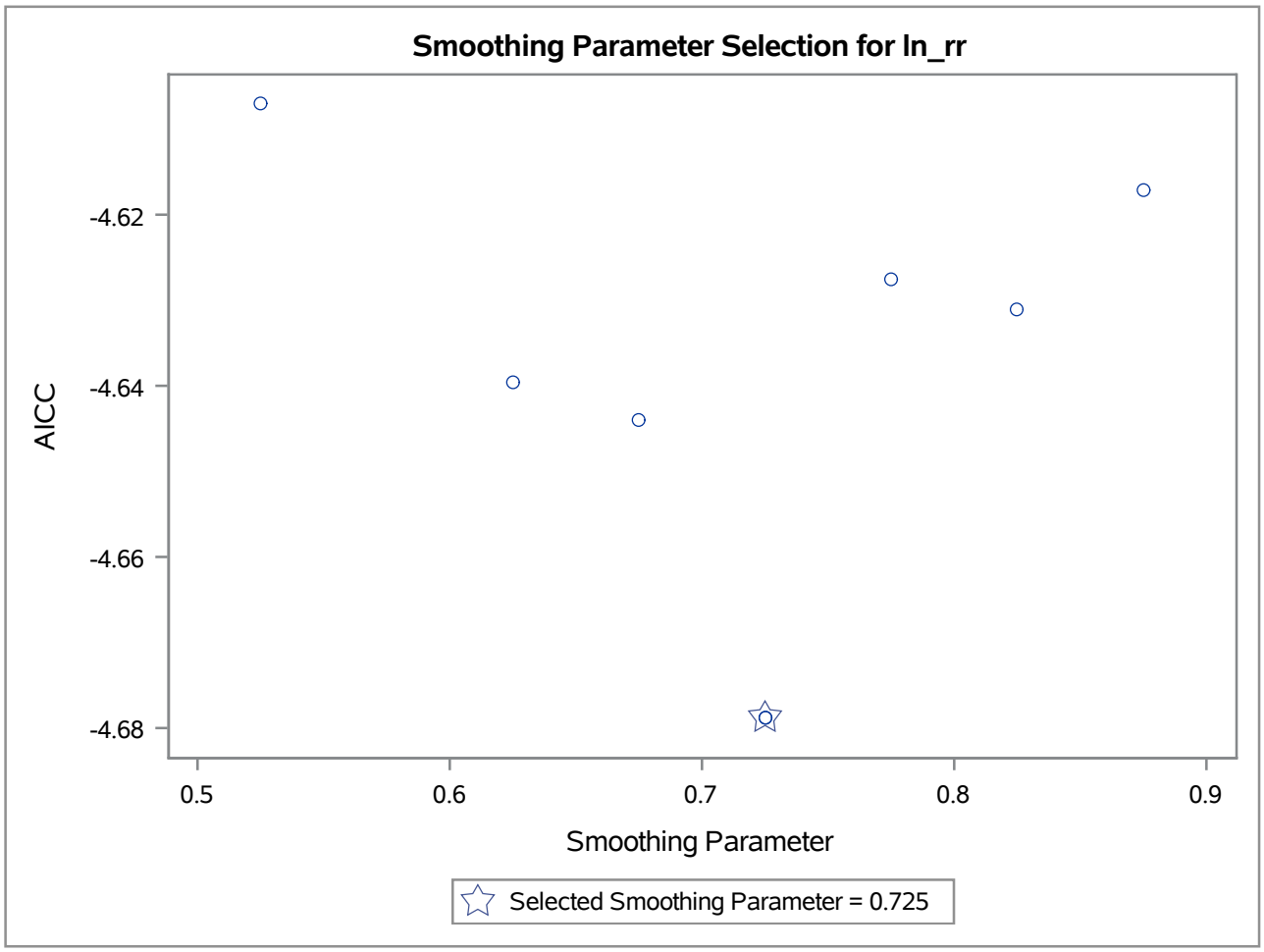
The GLM Procedure



The LOESS Procedure

Independent Variable Scaling	
Scaling applied: None	
Statistic	**year**
Minimum Value	2002
Maximum Value	2021

The LOESS Procedure
Dependent Variable: ln_rr



Optimal Smoothing Criterion	
AICC	Smoothing Parameter
-4.67874	0.72500

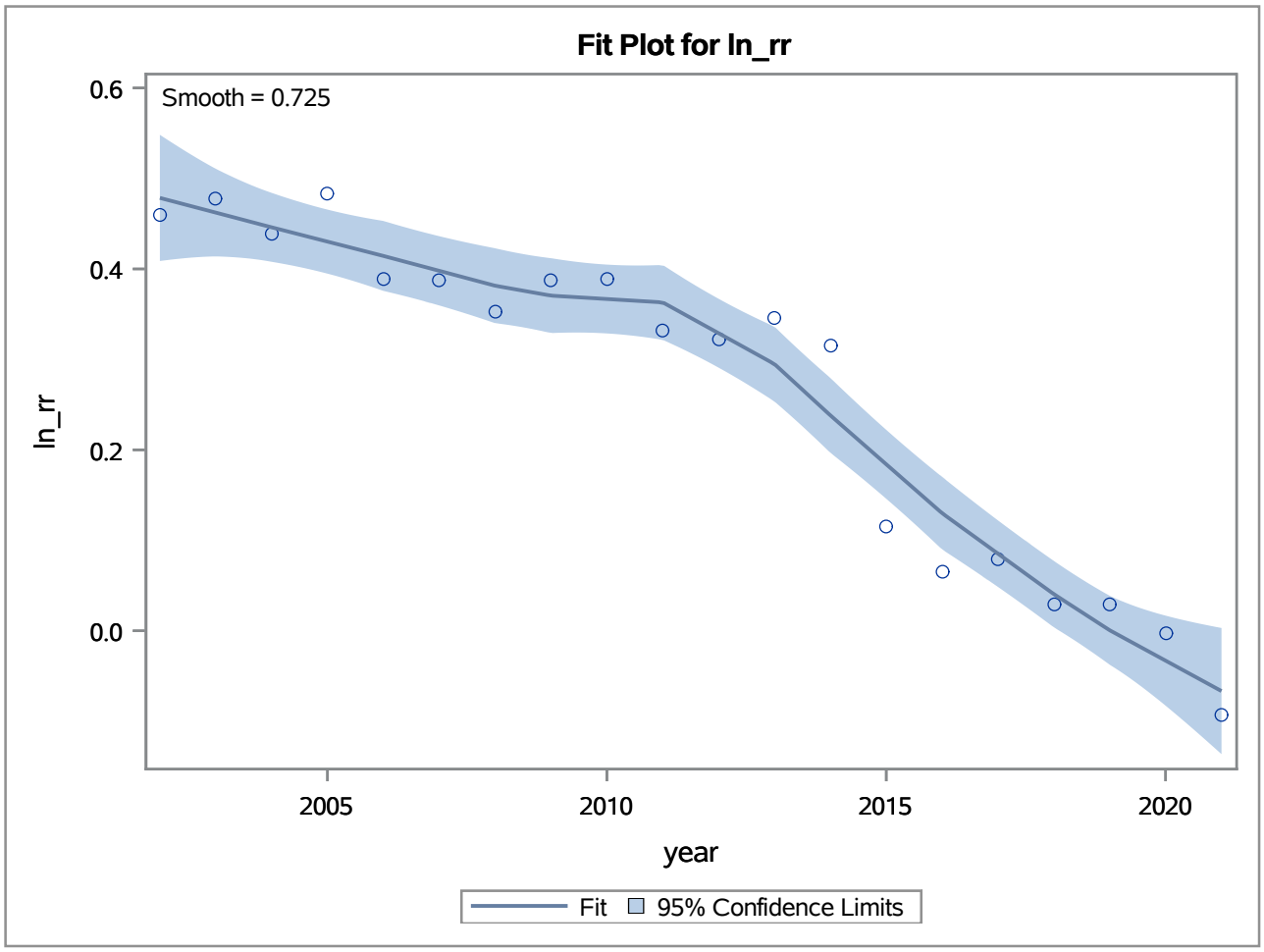
Binge Drinking US 18-25 by gender
Log Relative Risk by year

The LOESS Procedure
Selected Smoothing Parameter: 0.725
Dependent Variable: ln_rr

Fit Summary	
Fit Method	kd Tree
Blending	Linear
Number of Observations	20
Number of Fitting Points	13
kd Tree Bucket Size	2
Degree of Local Polynomials	2
Smoothing Parameter	0.72500
Points in Local Neighborhood	14
Residual Sum of Squares	0.02691
Trace[L]	5.04145
GCV	0.00012024
AICC	-4.67874
AICC1	-93.07114
Delta1	14.52998
Delta2	14.21814
Equivalent Number of Parameters	4.61289
Lookup Degrees of Freedom	14.84867
Residual Standard Error	0.04303

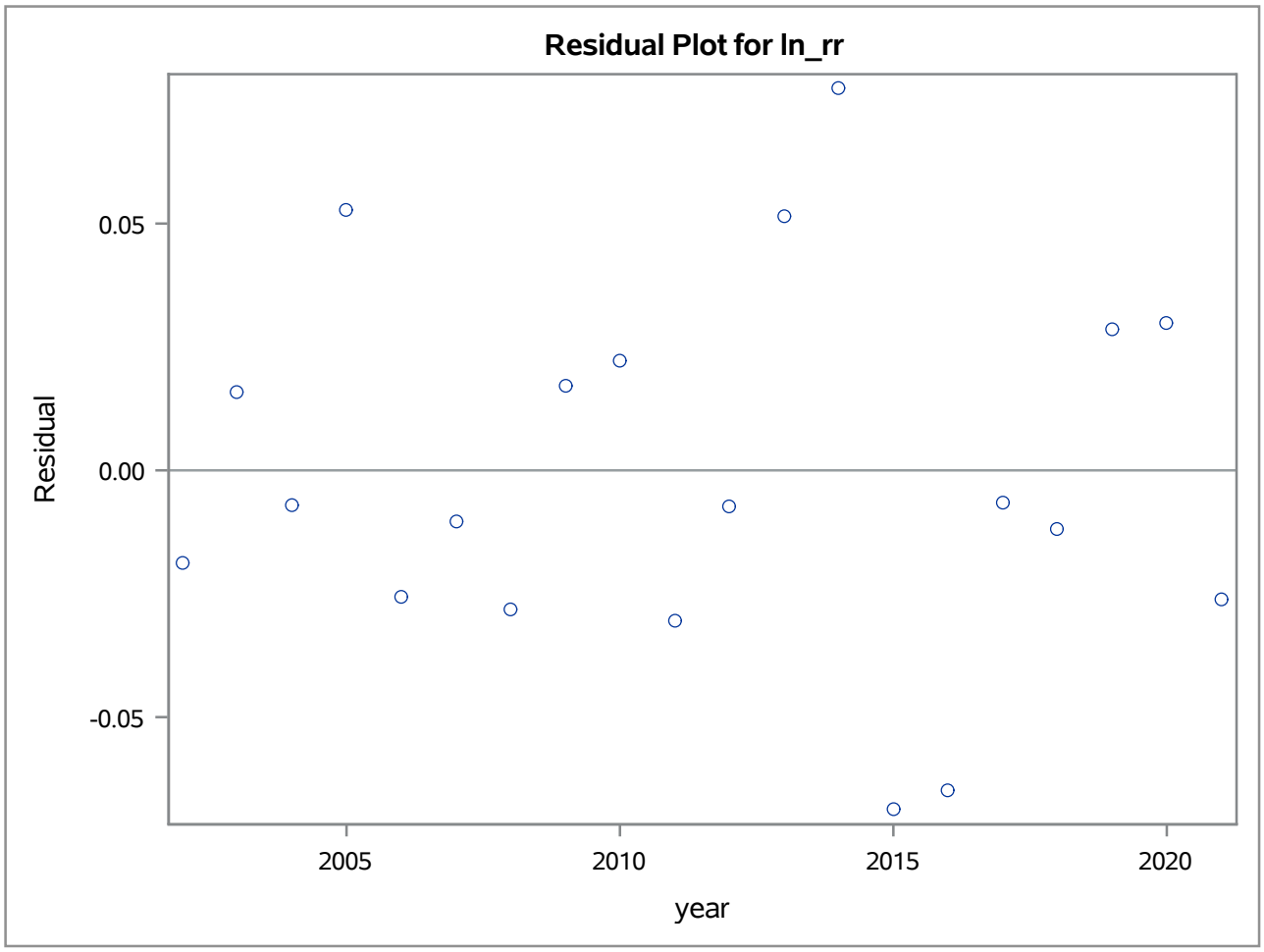
Binge Drinking US 18-25 by gender
Log Relative Risk by year

The LOESS Procedure
Selected Smoothing Parameter: 0.725
Dependent Variable: ln_rr



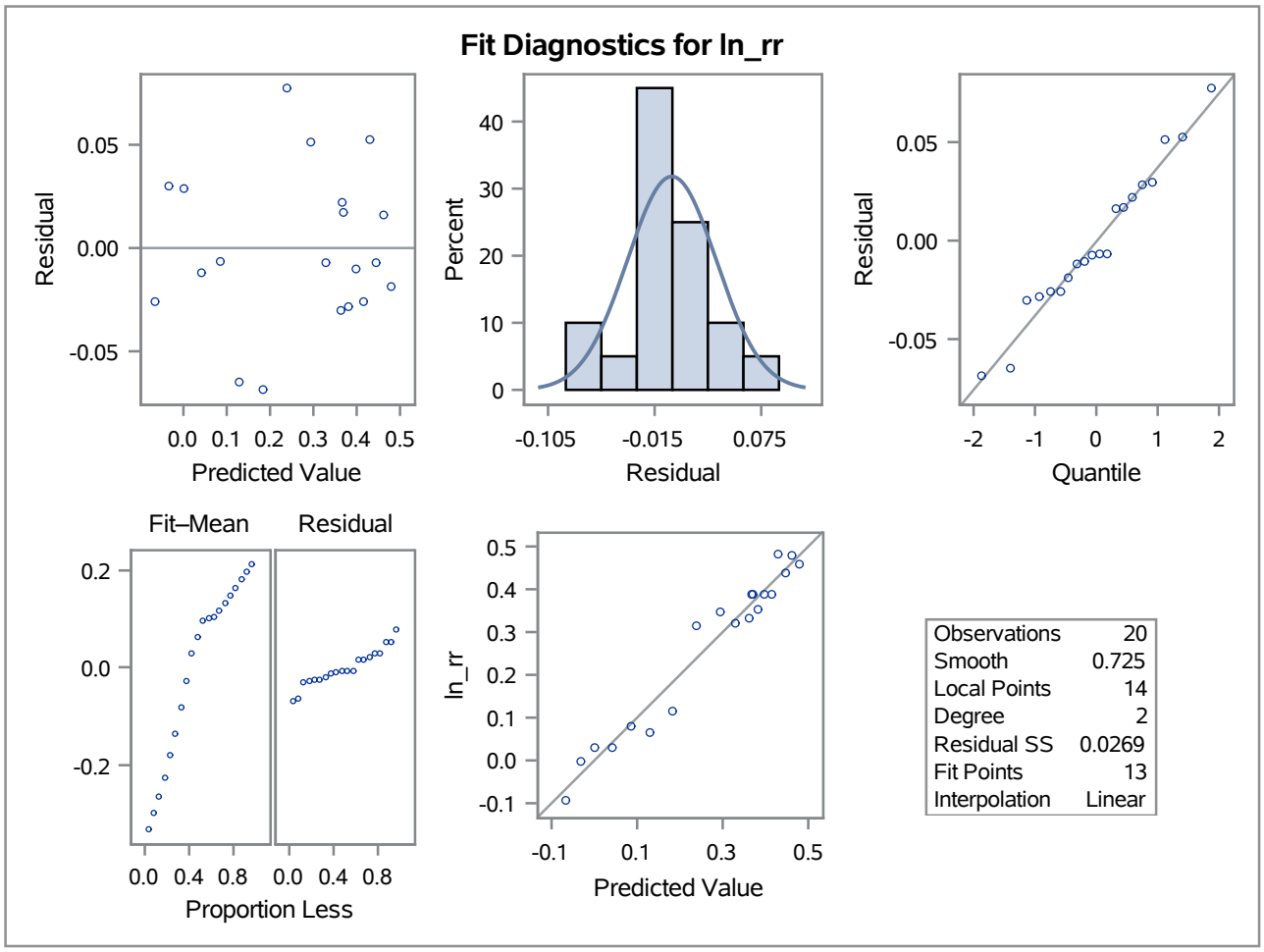
Binge Drinking US 18-25 by gender
Log Relative Risk by year

The LOESS Procedure
Selected Smoothing Parameter: 0.725
Dependent Variable: ln_rr



Binge Drinking US 18-25 by gender
Log Relative Risk by year

The LOESS Procedure
Selected Smoothing Parameter: 0.725
Dependent Variable: ln_rr

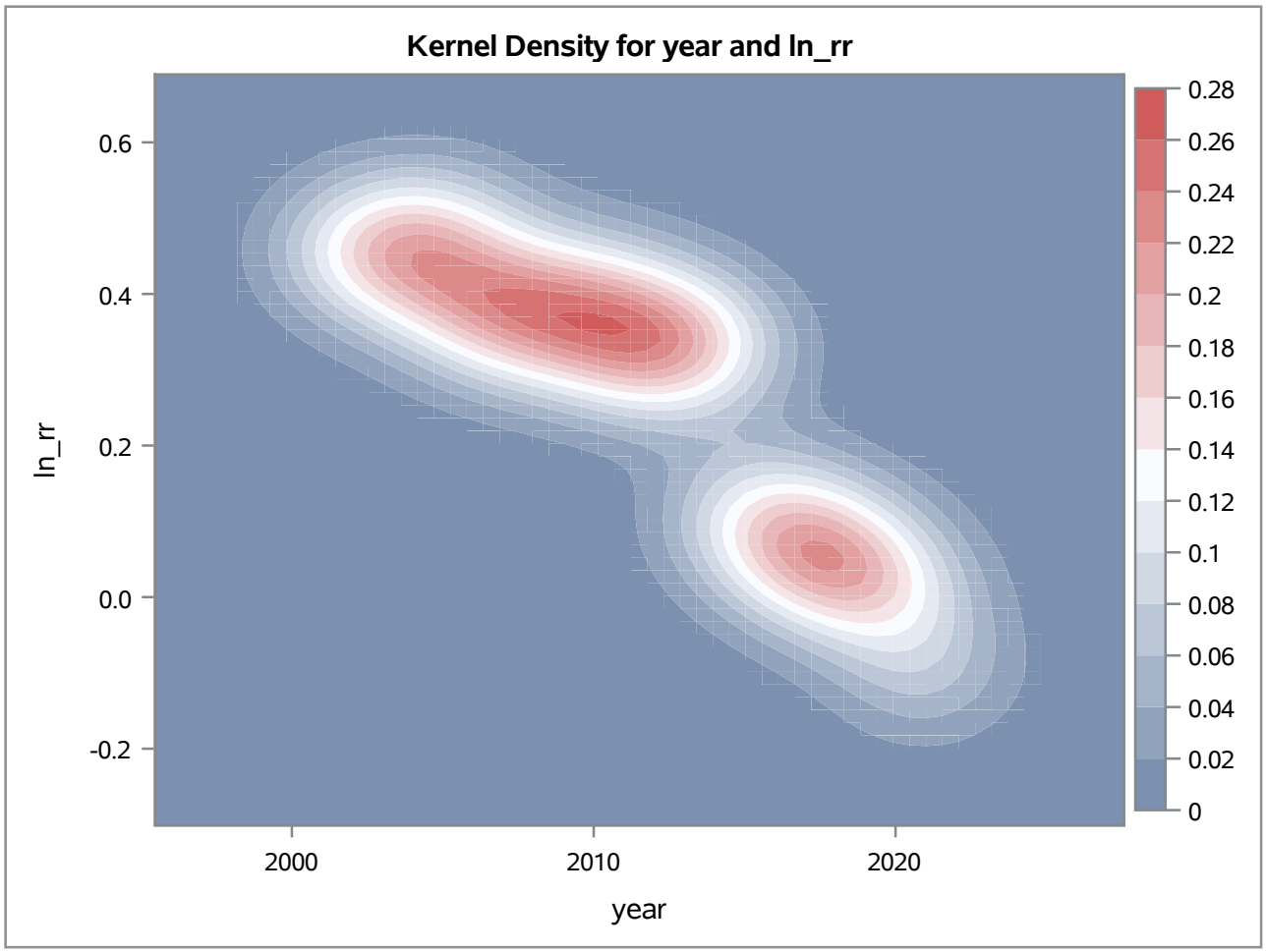


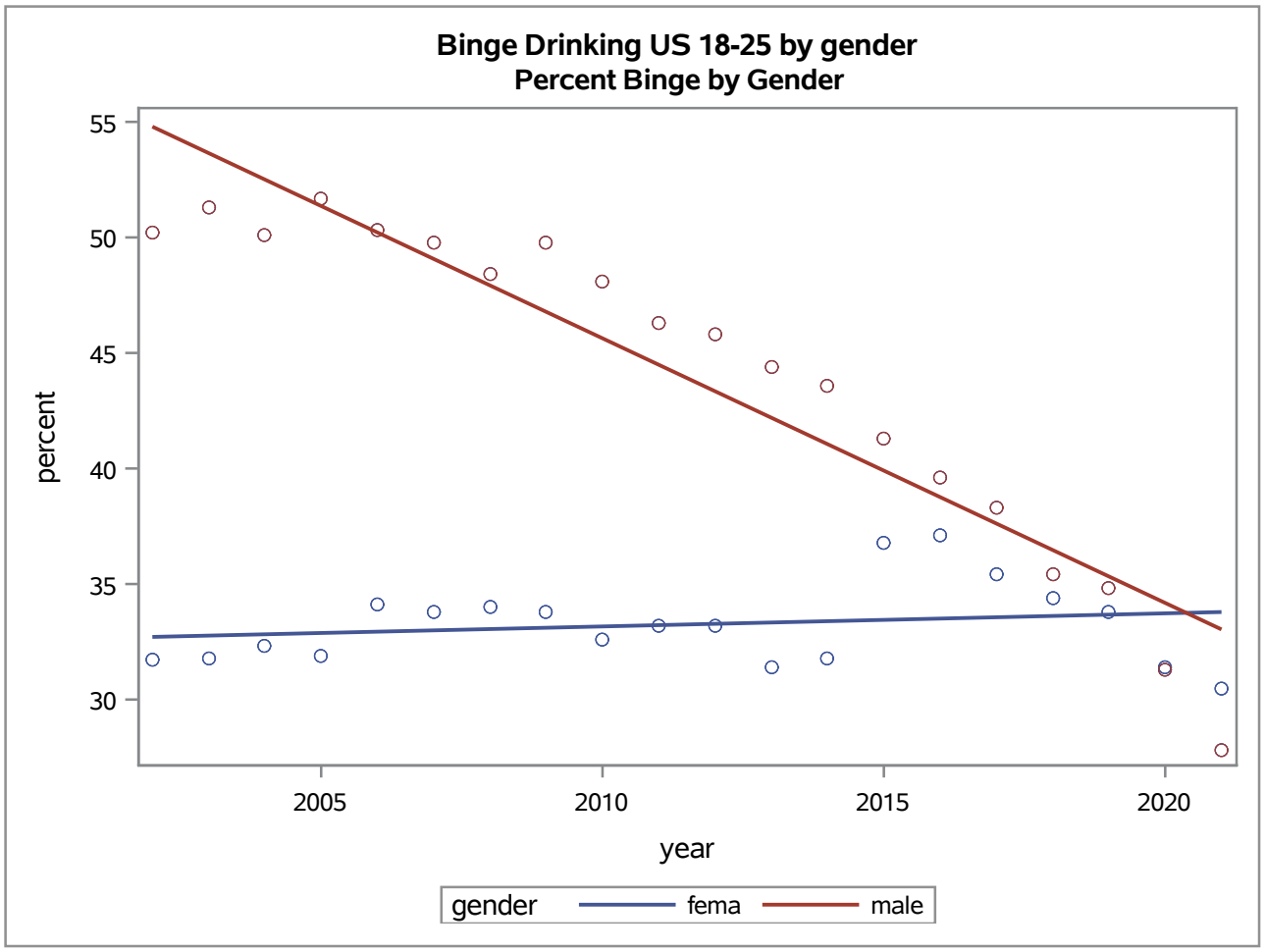
Binge Drinking US 18-25 by gender
Log Relative Risk by year

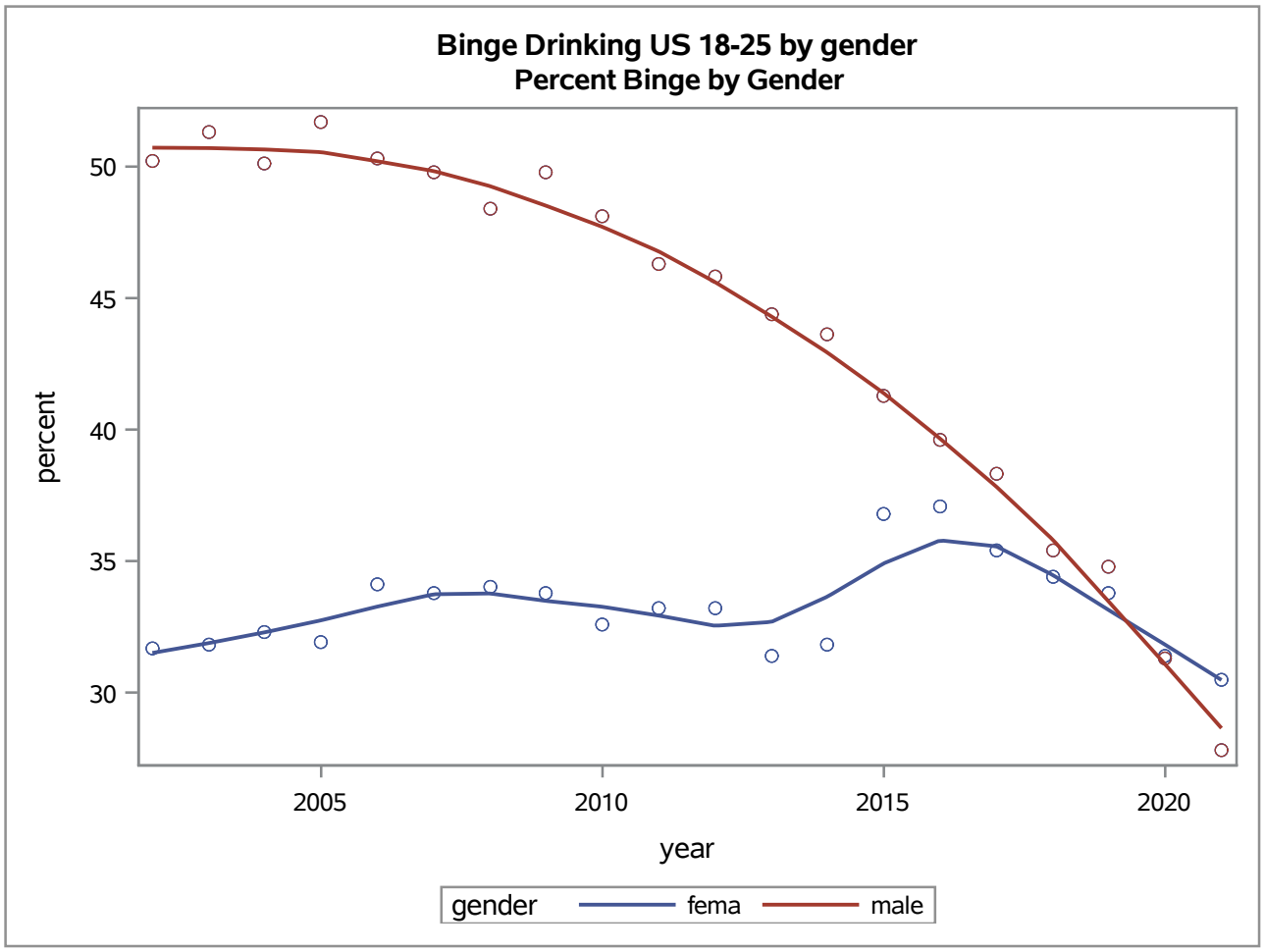
The KDE Procedure

Inputs	
Data Set	WORK.BINGE
Number of Observations Used	20
Variable 1	year
Variable 2	ln_rr
Bandwidth Method	Simple Normal Reference

Controls		
	year	**ln_rr**
Grid Points	60	60
Lower Grid Limit	1995.5	-0.3
Upper Grid Limit	2027.5	0.6897
Bandwidth Multiplier	0.6	0.6




Binge Drinking US 18-25 by gender
Percent Binge by Gender
55
50
45
40
35
30
percent
2005
2010
2015
2020
year
gender
fema
male


Binge Drinking US 18-25 by gender
Percent Binge by Gender
percent
50
45
40
35
30
2005
2010
2015
2020
year
gender
fema
male

The ORTHOREG Procedure

Class Level Information			
Factor	**Levels**	**Values**	
gender	2	fema	male

Binge Drinking US 18-25 by gender
Percent Binge by Gender

The ORTHOREG Procedure

Dependent Variable: percent

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	6	2128.469133	354.7448555	233.07	<.0001
Error	33	50.22861672	1.522079295		
Corrected Total	39	2178.697750			

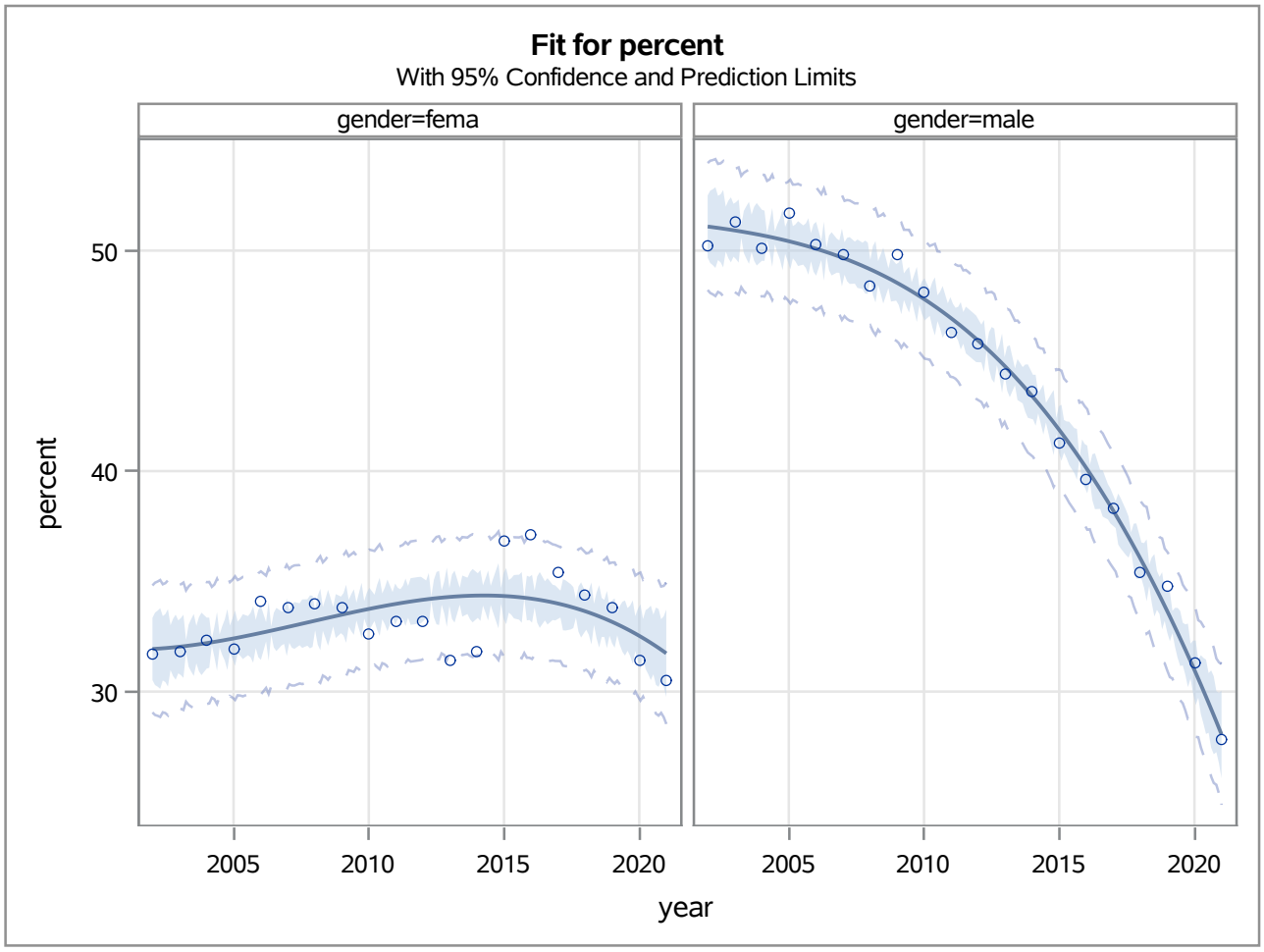
Root MSE	1.2337257777
R-Square	0.9769455783

Parameter	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
Intercept	1	17531831.78781	10688127.99	1.64	0.1104
year	1	-26298.41015	15940.63556	-1.65	0.1085
year^2	1	13.149641504934	7.924772999	1.66	0.1065
year^3	1	-0.002191690767	0.0013132434	-1.67	0.1046
(gender='fema')	1	205016.14393	53279.33217	3.85	0.0005
(gender='male')	0	0	.	.	.
year*gender fema	1	-205.058219412346	52.97503320	-3.87	0.0005
year*gender male	0	0	.	.	.
year^2*gender fema	1	0.051270221007	0.0131680313	3.89	0.0005
year^2*gender male	0	0	.	.	.
year^3*gender fema	0	0	.	.	.
year^3*gender male	0	0	.	.	.

Binge Drinking US 18-25 by gender
Percent Binge by Gender

The ORTHOREG Procedure

Dependent Variable: percent



The ORTHOREG Procedure

Class Level Information			
Factor	**Levels**	**Values**	
gender	2	fema	male

The ORTHOREG Procedure

Dependent Variable: percent

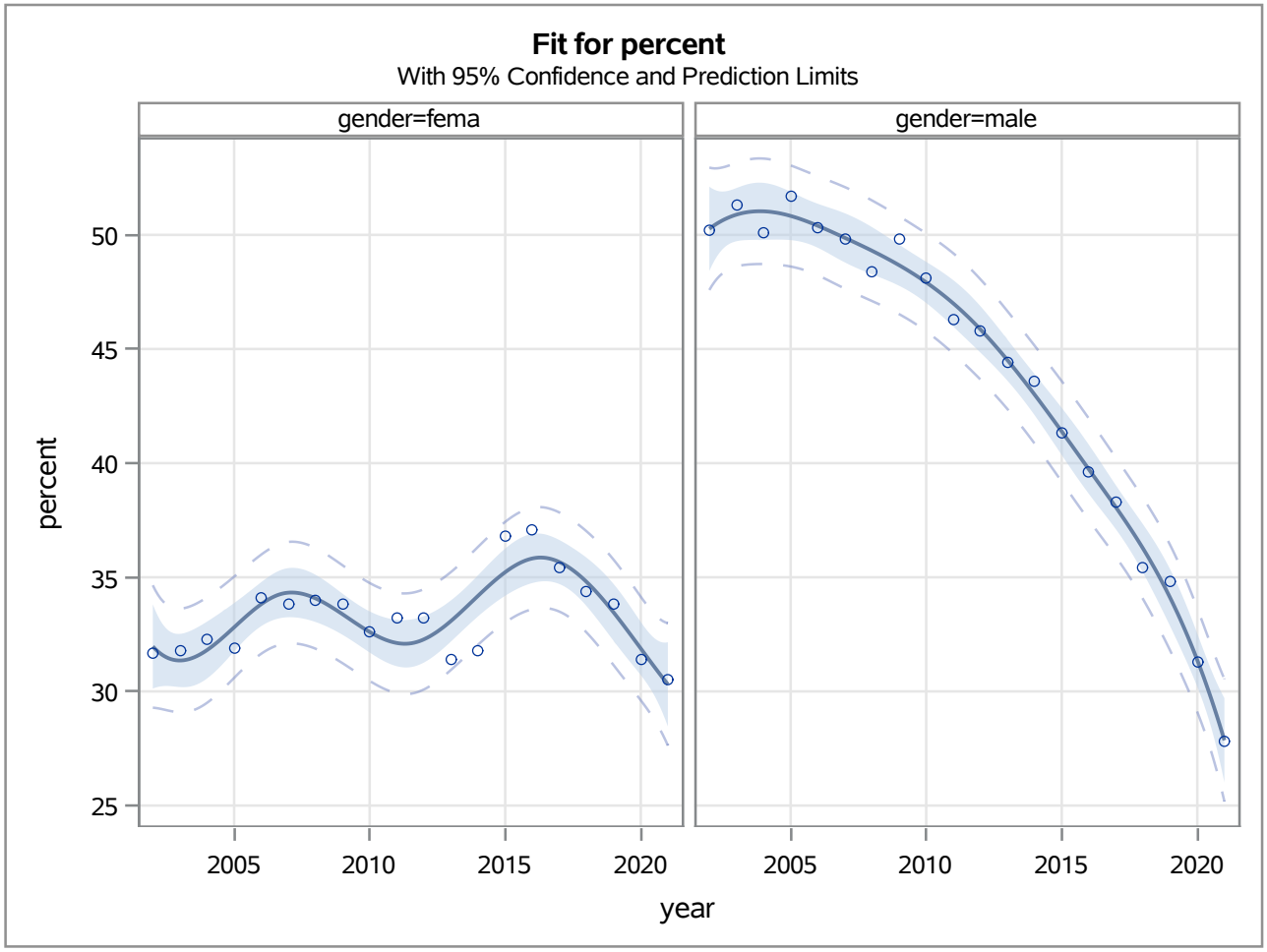
Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	13	2155.404590	165.8003531	185.07	<.0001
Error	26	23.29315985	0.895890763		
Corrected Total	39	2178.697750			

Root MSE	0.9465150624
R-Square	0.9893086777

Parameter	DF	Parameter Estimate	Standard Error	t Value	Pr > |t|
(gender='fema')	1	25.053337437092	12.00310627	2.09	0.0468
(gender='male')	1	1.465940456542	12.00310627	0.12	0.9037
spl 1	1	40.032695230358	15.67922315	2.55	0.0169
spl 2	1	51.049309242183	12.73212622	4.01	0.0005
spl 3	1	48.569708430327	11.70731137	4.15	0.0003
spl 4	1	45.904532991891	12.55231330	3.66	0.0011
spl 5	1	37.757534613837	11.14207999	3.39	0.0022
spl 6	1	30.151344717763	14.32244848	2.11	0.0451
spl 7	0	0	.	.	.
spl*gender 1 fema	1	-14.810509370581	22.17377003	-0.67	0.5101
spl*gender 1 male	0	0	.	.	.
spl*gender 2 fema	1	-50.140485967510	18.00594558	-2.78	0.0099
spl*gender 2 male	0	0	.	.	.
spl*gender 3 fema	1	-35.931972872763	16.55663851	-2.17	0.0393
spl*gender 3 male	0	0	.	.	.
spl*gender 4 fema	1	-42.029586508071	17.75165171	-2.37	0.0256
spl*gender 4 male	0	0	.	.	.
spl*gender 5 fema	1	-23.596364596501	15.75728064	-1.50	0.1463
spl*gender 5 male	0	0	.	.	.
spl*gender 6 fema	1	-25.808399829904	20.25500088	-1.27	0.2139
spl*gender 6 male	0	0	.	.	.
spl*gender 7 fema	0	0	.	.	.
spl*gender 7 male	0	0	.	.	.

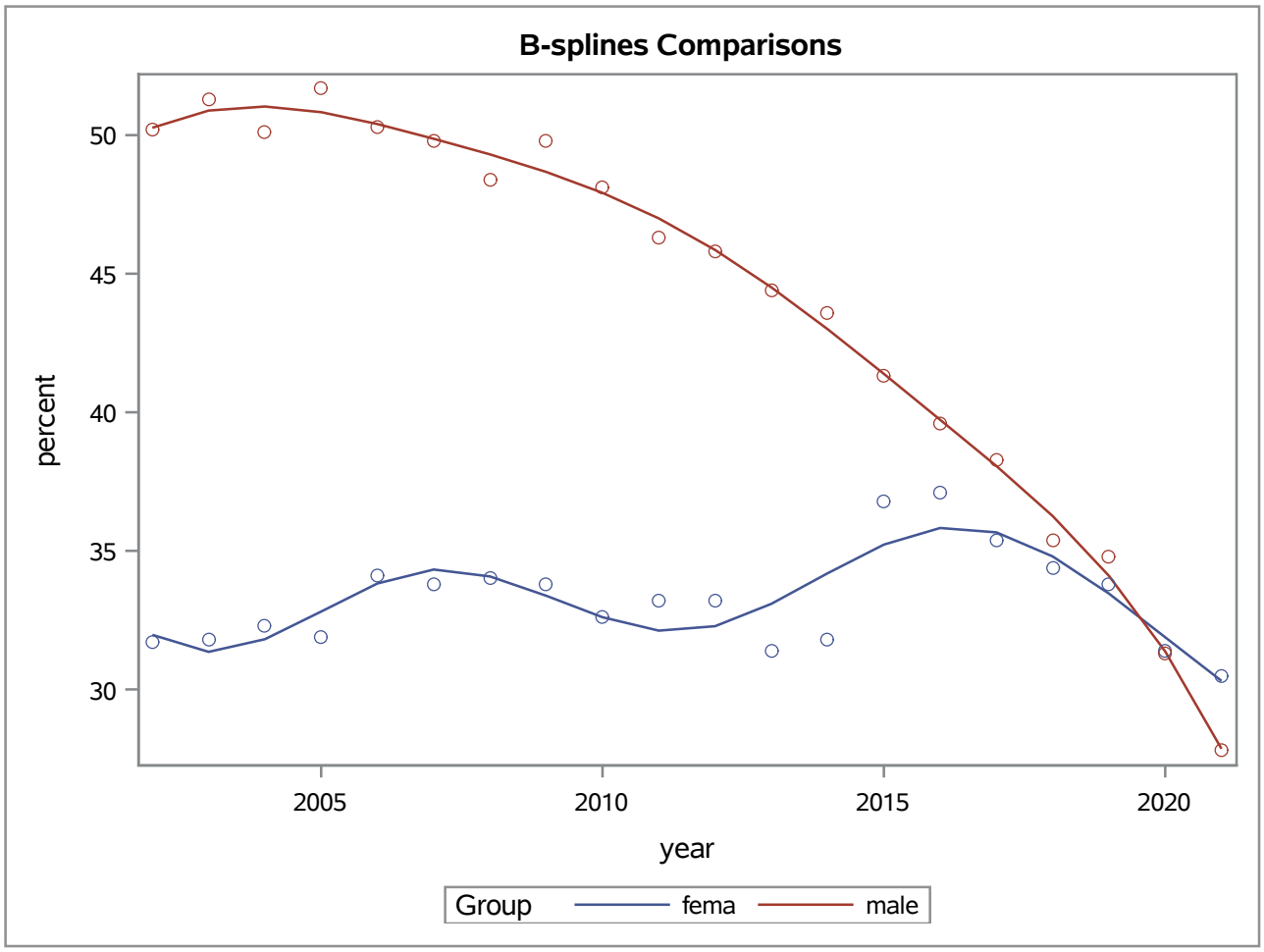
The ORTHOREG Procedure

Dependent Variable: percent



The PLM Procedure

Store Information	
Item Store	WORK.ORTHO_SPLINE
Data Set Created From	WORK.NEW_BINGE
Created By	PROC ORTHOREG
Date Created	27NOV23:15:06:14
Response Variable	percent
Class Variable	gender
Constructed Effect	spl
Model Effects	gender spl spl*gender


B-splines Comparisons
percent
50
45
40
35
30
2005
2010
2015
2020
year
Group
fema
male

Diff = female - male percent binge drinking

The PLM Procedure

Store Information	
Item Store	WORK.ORTHO_SPLINE
Data Set Created From	WORK.NEW_BINGE
Created By	PROC ORTHOREG
Date Created	27NOV23:15:06:14
Response Variable	percent
Class Variable	gender
Constructed Effect	spl
Model Effects	gender spl spl*gender

Class Level Information		
Class	**Levels**	**Values**
gender	2	fema male

Diff = female - male percent binge drinking

The PLM Procedure

Knots for Spline Effect spl		
Knot Number	Boundary	year
1	*	1992.5
2	*	1997.25
3	*	2002
4		2006.75
5		2011.5
6		2016.25
7	*	2021
8	*	2025.75
9	*	2030.5

Diff = female - male percent binge drinking

The PLM Procedure

Basis Details for Spline Effect spl			
Column	Support		Support Knots
1	1992.5	2006.75	1-4
2	1992.5	2011.5	1-5
3	1997.25	2016.25	2-6
4	2002	2021	3-7
5	2006.75	2025.75	4-8
6	2011.5	2030.5	5-9
7	2016.25	2030.5	6-9

Estimate								
Label	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper
Diff at year=2010	-15.3136	0.6202	26	-24.69	<.0001	0.05	-16.5885	-14.0388

Estimate								
Label	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper
Diff at year=2015	-6.1619	0.7114	26	-8.66	<.0001	0.05	-7.6241	-4.6996

Estimate								
Label	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper
Diff at year=2018	-1.4573	0.7290	26	-2.00	0.0562	0.05	-2.9558	0.04131

Estimate								
Label	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper
Diff at year=2020	0.5105	0.8017	26	0.64	0.5299	0.05	-1.1375	2.1585

Estimate								
Label	Estimate	Standard Error	DF	t Value	Pr > |t|	Alpha	Lower	Upper
Diff at year=2021	2.4491	1.2686	26	1.93	0.0645	0.05	-0.1586	5.0567