Portion Size Effect for Children at High and Low Familial Risk for Obesity (Food and Brain Study)

Contents

1 Demographics

Table 1: Demographics

Characteristic	Risk Groups		Overall
	Low Risk, N = 50	**High Risk**, N = 36	**N = 86**
Sex			
Male	29 (58%)	16 (44%)	45 (52%)
Female	21 (42%)	20 (56%)	41 (48%)
Age, yr	7.8 (0.7)	7.7 (0.5)	7.8 (0.6)
Ethnicity			
Not Hispanic/Lantinx	50 (100%)	36 (100%)	86 (100%)
Race			
0	47 (94%)	36 (100%)	83 (97%)
2	3 (6.0%)	0 (0%)	3 (3.5%)
Income			
< $51,000	4 (8.2%)	7 (21%)	11 (13%)
>$100,000	23 (47%)	7 (21%)	30 (36%)
$51,000 - $100,000	22 (45%)	20 (59%)	42 (51%)
Unknown	1	2	3
BMI %tile	41.2 (24.4)	56.1 (24.3)	47.4 (25.3)
Satiety Responsiveness	2.8 (0.6)	3.1 (0.6)	2.9 (0.6)
Mother's Education			
> Bachelor Degree	21 (43%)	5 (14%)	26 (31%)
AA/Technical Degree	3 (6.1%)	6 (17%)	9 (11%)
Bachelor Degree	22 (45%)	19 (53%)	41 (48%)
High School/GED	3 (6.1%)	6 (17%)	9 (11%)
Unknown	1	0	1
Father's Education			
> Bachelor Degree	27 (54%)	3 (9.4%)	30 (37%)
AA/Technical Degree	3 (6.0%)	11 (34%)	14 (17%)
Bachelor Degree	14 (28%)	12 (38%)	26 (32%)
High School/GED	6 (12%)	5 (16%)	11 (13%)
Other/NA	0 (0%)	1 (3.1%)	1 (1.2%)
Unknown	0	4	4

[1] n (%); Mean (SD)

Age - t-test

```
    Welch Two Sample t-test

data:  age_yr by risk_status_mom
t = 0.50681, df = 82.343, p-value = 0.6136
alternative hypothesis: true difference in means between group Low Risk and group High Risk is not equal
95 percent confidence interval:
 -0.1939215  0.3265215
sample estimates:
 mean in group Low Risk mean in group High Risk
                 7.8138                  7.7475
```

BMI Percentile - t-test

```
    Welch Two Sample t-test

data:  bmi_percentile by risk_status_mom
t = -2.8105, df = 75.711, p-value = 0.006292
alternative hypothesis: true difference in means between group Low Risk and group High Risk is not equal
95 percent confidence interval:
 -25.551839  -4.356339
sample estimates:
 mean in group Low Risk mean in group High Risk
               41.15980                56.11389

 Low Risk High Risk
 24.38858  24.30838
```

Sex - χ^2

```
    Pearson's Chi-squared test with Yates' continuity correction

data:  r01_intake$sex and r01_intake$risk_status_mom
X-squared = 1.0462, df = 1, p-value = 0.3064
```

Income - χ^2

```
    Pearson's Chi-squared test

data:  r01_intake$income and r01_intake$risk_status_mom
X-squared = 6.9633, df = 2, p-value = 0.03076
```

Mom Education - Fisher test

```
    Fisher's Exact Test for Count Data

data:  r01_intake$mom_ed and r01_intake$risk_status_mom
p-value = 0.01375
alternative hypothesis: two.sided
```

2 Meal Liking

Table 2: Regression Table: Portion Size for Liking

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	3.154	0.893	81.796	3.533	0.001
preFF	-0.002	0.001	307.001	-2.302	0.022
bmi	0.028	0.052	80.948	0.539	0.591
sexFemale	0.118	0.128	80.620	0.924	0.358
cebq_sr	0.065	0.102	80.440	0.642	0.522
meal_order	0.018	0.014	254.676	1.275	0.203
risk_status_momHigh Risk	0.006	0.139	81.047	0.045	0.964
ps_prop	0.023	0.044	254.705	0.520	0.603

2.1 Chicken Nuggets

Table 3: Regression Table: Portion Size for Liking of Chicken Nuggets

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	2.830	1.196	82.536	2.365	0.020
preFF	-0.002	0.001	320.946	-1.476	0.141
bmi	0.057	0.069	81.394	0.820	0.415
sexFemale	-0.163	0.171	80.969	-0.949	0.345
cebq_sr	0.173	0.136	80.736	1.273	0.207
meal_order	0.037	0.023	255.055	1.636	0.103
risk_status_momHigh Risk	0.027	0.186	81.521	0.145	0.885
ps_prop	0.029	0.069	255.094	0.422	0.673

2.2 Mac and Cheese

Table 4: Regression Table: Portion Size for Liking of Mac and Cheese

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	2.265	1.383	82.781	1.638	0.105
preFF	-0.002	0.001	324.116	-1.344	0.180
bmi	0.098	0.080	81.557	1.228	0.223
sexFemale	0.217	0.198	81.106	1.095	0.277
cebq_sr	-0.028	0.157	80.860	-0.180	0.858
meal_order	0.006	0.027	255.202	0.217	0.829
risk_status_momHigh Risk	0.165	0.215	81.692	0.769	0.444
ps_prop	-0.027	0.083	255.242	-0.322	0.748

2.3 Grapes

Table 5: Regression Table: Portion Size for Liking of Grapes

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	2.871	1.252	82.589	2.293	0.024
preFF	-0.001	0.001	325.998	-1.032	0.303
bmi	0.031	0.072	81.313	0.422	0.674
sexFemale	0.177	0.179	80.847	0.989	0.325
cebq_sr	0.272	0.142	80.593	1.910	0.060
meal_order	0.009	0.026	254.949	0.336	0.737
risk_status_momHigh Risk	0.094	0.194	81.453	0.482	0.631
ps_prop	-0.004	0.077	254.991	-0.054	0.957

2.4 Broccoli

Table 6: Regression Table: Portion Size for Liking of Broccoli

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	4.667	1.998	81.135	2.336	0.022
preFF	-0.002	0.001	292.736	-1.534	0.126
bmi	-0.075	0.116	80.537	-0.646	0.520
sexFemale	0.241	0.287	80.297	0.838	0.404
cebq_sr	-0.155	0.228	80.166	-0.681	0.498
meal_order	0.022	0.027	254.329	0.809	0.419
risk_status_momHigh Risk	-0.258	0.311	80.609	-0.831	0.409
ps_prop	0.092	0.081	254.351	1.143	0.254

3 Portion Size Effect

Note - Portion Size was coded in ps_prop as the proportion increase in amount served: Portion Size 1 = 0, Portion Size 2 = 0.33, Portion Size 3 = 0.66, and Portion Size 4 = 0.99. This means that a 1 unit increase is equal to a 100% increase in amount served – the difference between Portion Size 1 and Portion Size 4.

3.1 Total Intake

Table 7: Intake by Portion Size

	Risk Groups		**Overall**
Characteristic	**Low Risk**, N = 50	**High Risk**, N = 36	**N = 86**
ps1_total_g	406.6 (170.2)	408.9 (165.6)	407.5 (167.3)
ps1_total_kcal	469.7 (201.2)	493.7 (197.2)	479.8 (198.7)
ps1_avg_vas	3.8 (0.6)	3.9 (0.6)	3.8 (0.6)
ps2_total_g	466.7 (174.3)	393.4 (160.9)	436.0 (171.8)
ps2_total_kcal	535.6 (208.9)	485.4 (217.3)	514.6 (212.7)
ps2_avg_vas	3.8 (0.6)	3.8 (0.7)	3.8 (0.6)
ps3_total_g	484.8 (191.5)	432.7 (189.3)	463.0 (191.2)
ps3_total_kcal	581.9 (239.1)	530.2 (287.2)	560.3 (260.0)
ps3_avg_vas	3.8 (0.6)	3.8 (0.7)	3.8 (0.6)
ps4_total_g	496.4 (192.8)	425.3 (168.4)	466.6 (185.4)
ps4_total_kcal	616.7 (249.1)	568.9 (253.5)	596.7 (250.6)
ps4_avg_vas	3.8 (0.7)	3.9 (0.6)	3.9 (0.6)

[1] Mean (SD)

3.2 Intake by Food

Table 8: High Risk: Intake by Portion Size

Characteristic	**PS-1**, N = 36	**PS-2**, N = 36	**PS-3**, N = 36	**PS-4**, N = 36
chnug_grams	64.8 (45.8)	64.3 (54.0)	77.1 (62.2)	85.6 (65.3)
chnug_kcal	162.1 (114.6)	160.7 (134.9)	192.7 (155.6)	214.1 (163.2)
mac_grams	133.0 (106.3)	132.8 (112.4)	136.1 (132.4)	142.5 (125.3)
mac_kcal	226.1 (180.8)	225.7 (191.1)	231.4 (225.1)	242.2 (213.1)
grape_grams	84.1 (65.6)	93.4 (76.2)	96.3 (88.7)	104.5 (91.4)
grape_kcal	58.4 (45.6)	64.9 (53.0)	66.9 (61.7)	72.6 (63.5)
broc_grams	32.7 (53.7)	23.1 (29.3)	24.6 (38.1)	23.9 (37.6)
broc_kcal	32.8 (53.9)	23.1 (29.4)	24.7 (38.2)	24.0 (37.7)
mac_vas	4.2 (0.8)	3.9 (1.1)	3.9 (1.1)	4.0 (1.0)
chnug_vas	4.3 (1.0)	4.2 (1.0)	4.1 (1.2)	4.3 (0.9)
broc_vas	2.9 (1.7)	2.8 (1.5)	2.8 (1.5)	2.9 (1.6)
grape_vas	4.2 (0.8)	4.4 (0.9)	4.4 (0.9)	4.4 (0.8)

[1] Mean (SD)

Table 9: Low Risk: Intake by Portion Size

Characteristic	**PS-1**, N = 50	**PS-2**, N = 50	**PS-3**, N = 50	**PS-4**, N = 50
chnug_grams	68.1 (42.0)	80.3 (49.0)	91.4 (59.9)	104.0 (67.9)
chnug_kcal	170.3 (104.9)	200.8 (122.6)	228.5 (149.8)	260.0 (169.7)
mac_grams	115.2 (91.8)	129.7 (103.8)	139.8 (116.9)	133.3 (108.7)
mac_kcal	195.8 (156.1)	220.5 (176.5)	237.7 (198.7)	226.6 (184.7)
grape_grams	95.9 (82.5)	105.5 (87.4)	105.8 (93.5)	117.9 (105.2)
grape_kcal	66.7 (57.3)	73.3 (60.7)	73.5 (65.0)	81.9 (73.1)
broc_grams	27.2 (41.3)	29.9 (55.2)	30.0 (55.4)	36.2 (66.6)
broc_kcal	27.3 (41.4)	30.0 (55.4)	30.1 (55.6)	36.3 (66.8)
mac_vas	3.6 (1.0)	3.7 (1.0)	3.8 (1.1)	3.7 (1.0)
chnug_vas	4.1 (0.9)	4.3 (0.7)	4.2 (0.7)	4.2 (0.9)
broc_vas	3.2 (1.2)	3.1 (1.1)	3.2 (1.2)	3.3 (1.3)
grape_vas	4.2 (0.9)	4.2 (1.0)	4.1 (1.1)	4.1 (1.0)

[1] Mean (SD)

3.3 Base Model - Test Quadratic Effect

All intake models are currently controlling for: pre-meal Freddy Fullness, child BMI, average VAS liking rating for the meal foods conducted at each meal, and meal order.

3.3.1 Grams

```
Data: intake_long
Models:
grams_ps_mod: grams ~ preFF + bmi + sex + age_yr + cebq_sr + avg_vas + meal_order + ps_prop + (1 | sub)
grams_psquad_mod: grams ~ preFF + bmi + sex + age_yr + cebq_sr + avg_vas + meal_order + ps_prop + ps_pr
                 npar    AIC    BIC  logLik deviance  Chisq Df Pr(>Chisq)
grams_ps_mod       11 4258.4 4300.6 -2118.2   4236.4
grams_psquad_mod   12 4257.5 4303.6 -2116.7   4233.5 2.9059  1    0.08826 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Table 10: Regression Table: Portion Size for Grams

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	492.559	290.510	82.122	1.695	0.094
preFF	-0.325	0.216	322.260	-1.509	0.132
bmi	17.781	12.120	78.826	1.467	0.146
sexFemale	-11.184	31.661	78.907	-0.353	0.725
age_yr	-23.461	25.849	78.420	-0.908	0.367
cebq_sr	-96.176	24.633	78.572	-3.904	0.000
avg_vas	36.269	15.032	328.597	2.413	0.016
meal_order	-5.973	4.135	252.952	-1.445	0.150
ps_prop	59.303	12.509	252.349	4.741	0.000

3.3.2 kcal

```
Data: intake_long
Models:
```

```
kcal_ps_mod: kcal ~ preFF + bmi + sex + age_yr + cebq_sr + avg_vas + meal_order + ps_prop + (1 | sub)
kcal_psquad_mod: kcal ~ preFF + bmi + sex + age_yr + cebq_sr + avg_vas + meal_order + ps_prop + ps_prop
                npar    AIC    BIC  logLik deviance  Chisq Df Pr(>Chisq)
kcal_ps_mod       11 4456.5 4498.7 -2217.2   4434.5
kcal_psquad_mod   12 4458.5 4504.5 -2217.2   4434.5 0.0189  1     0.8907
```

Table 11: Regression Table: Portion Size for kcal

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	592.471	352.195	82.925	1.682	0.096
preFF	-0.866	0.290	330.905	-2.981	0.003
bmi	31.992	14.653	79.316	2.183	0.032
sexFemale	-18.196	38.280	79.391	-0.475	0.636
age_yr	-56.592	31.239	78.835	-1.812	0.074
cebq_sr	-122.042	29.774	78.997	-4.099	0.000
avg_vas	55.753	19.846	311.426	2.809	0.005
meal_order	3.506	5.697	253.622	0.615	0.539
ps_prop	118.103	17.240	252.976	6.851	0.000

3.4 Risk Status x Portion Size (linear effect)

3.4.1 Grams

Adding an interaction between Risk Status and Portion Size significantly improved model fit.

```
Data: intake_long
Models:
grams_ps_mod: grams ~ preFF + bmi + sex + age_yr + cebq_sr + avg_vas + meal_order + ps_prop + (1 | sub)
grams_psxrisk_mod: grams ~ preFF + bmi + sex + age_yr + cebq_sr + avg_vas + meal_order + risk_status_mo
                  npar    AIC    BIC  logLik deviance  Chisq Df Pr(>Chisq)
grams_ps_mod        11 4258.4 4300.6 -2118.2   4236.4
grams_psxrisk_mod   13 4254.5 4304.4 -2114.3   4228.5 7.8652  2    0.01959 *
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Table 12: Regression Table: Risk x Portion Size for Grams

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	416.084	293.887	81.408	1.416	0.161
preFF	-0.337	0.215	319.184	-1.568	0.118
bmi	23.116	12.744	78.432	1.814	0.074
sexFemale	-6.206	31.750	78.267	-0.195	0.846
age_yr	-26.050	25.813	77.734	-1.009	0.316
cebq_sr	-89.308	25.052	77.786	-3.565	0.001
avg_vas	35.215	14.916	326.701	2.361	0.019
meal_order	-5.802	4.095	252.232	-1.417	0.158
risk_status_momHigh Risk	-14.647	36.456	100.512	-0.402	0.689
ps_prop	84.970	16.242	251.743	5.231	0.000
risk_status_momHigh Risk:ps_prop	-61.224	25.096	251.928	-2.440	0.015

Figure 1: Grams Consumed: Risk Status x Portion Size

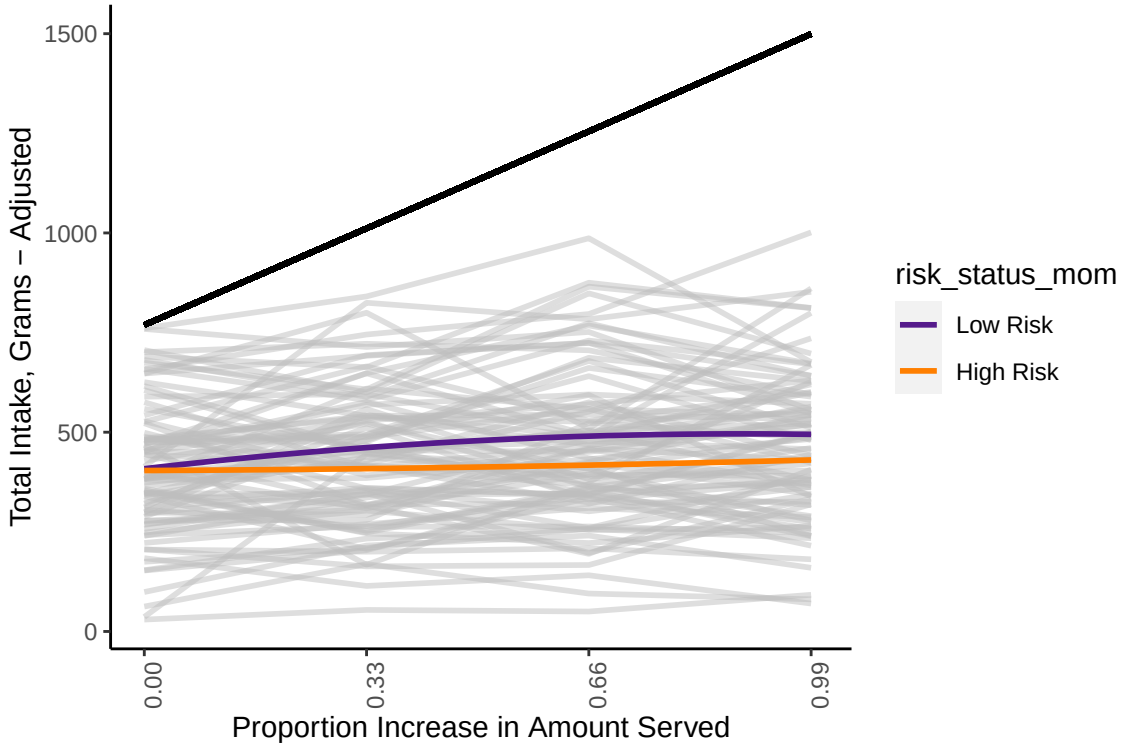


Table 13: Estimated Simple Slopes: Risk Status x Linear Portion Size for Grams

risk_status_mom	ps_prop.trend	SE	df	t.ratio	p.value
Low Risk	84.970	16.242	253.379	5.231	0.000
High Risk	23.746	19.142	253.438	1.241	0.216

Table 14: Estimated Marginal Means: Risk Status x Portion Size for Grams

	Low Risk	High Risk
0	421.319	403.272
0.33	448.423	410.766
0.66	477.006	414.724
0.99	507.665	431.448

```
    Welch Two Sample t-test

data:  grams_pred_rxps by risk_status_mom
t = 0.54902, df = 78.638, p-value = 0.5845
alternative hypothesis: true difference in means between group Low Risk and group High Risk is not equal
95 percent confidence interval:
 -47.38612  83.47993
sample estimates:
```

```
 mean in group Low Risk mean in group High Risk
              421.3193                403.2724


    Welch Two Sample t-test

data:  grams_pred_rxps by risk_status_mom
t = 1.1393, df = 77.467, p-value = 0.2581
alternative hypothesis: true difference in means between group Low Risk and group High Risk is not equal
95 percent confidence interval:
 -28.15189 103.46615
sample estimates:
 mean in group Low Risk mean in group High Risk
              448.4235                410.7663


    Welch Two Sample t-test

data:  grams_pred_rxps by risk_status_mom
t = 1.868, df = 76.96, p-value = 0.06557
alternative hypothesis: true difference in means between group Low Risk and group High Risk is not equal
95 percent confidence interval:
  -4.109184 128.672336
sample estimates:
 mean in group Low Risk mean in group High Risk
              477.0060                414.7245


    Welch Two Sample t-test

data:  grams_pred_rxps by risk_status_mom
t = 2.3409, df = 79.553, p-value = 0.02174
alternative hypothesis: true difference in means between group Low Risk and group High Risk is not equal
95 percent confidence interval:
  11.41789 141.01546
sample estimates:
 mean in group Low Risk mean in group High Risk
              507.6645                431.4479
```

3.4.1.1 No Plate Cleaners

Table 15: Regression Table: No Plate Cleaners - Risk x Portion Size for grams

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	348.213	296.273	79.152	1.175	0.243
preFF	-0.318	0.213	310.668	-1.494	0.136
bmi	20.351	12.901	76.202	1.578	0.119
sexFemale	1.011	31.898	76.191	0.032	0.975
age_yr	-16.131	26.411	75.613	-0.611	0.543
cebq_sr	-76.641	26.108	75.704	-2.936	0.004
avg_vas	32.681	14.912	318.475	2.192	0.029
meal_order	-6.462	4.088	246.080	-1.581	0.115
risk_status_momHigh Risk	-19.347	36.823	97.213	-0.525	0.600
ps_prop	87.198	16.184	245.743	5.388	0.000
risk_status_momHigh Risk:ps_prop	-58.461	25.073	245.945	-2.332	0.021

3.4.2 kcal

Adding an interaction between Risk Status and Portion Size (linear effect) significantly improved model fit.

```
Data: intake_long
Models:
kcal_ps_mod: kcal ~ preFF + bmi + sex + age_yr + cebq_sr + avg_vas + meal_order + ps_prop + (1 | sub)
kcal_psxrisk_mod: kcal ~ preFF + bmi + sex + age_yr + cebq_sr + avg_vas + meal_order + risk_status_mom =
                 npar    AIC    BIC  logLik deviance  Chisq Df Pr(>Chisq)
kcal_ps_mod        11 4456.5 4498.7 -2217.2   4434.5
kcal_psxrisk_mod   13 4455.8 4505.7 -2214.9   4429.8 4.7108  2    0.09486 .
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

Table 16: Regression Table: Risk x Portion Size for kcal

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	540.345	359.042	82.117	1.505	0.136
preFF	-0.883	0.291	327.796	-3.038	0.003
bmi	35.304	15.531	78.892	2.273	0.026
sexFemale	-15.074	38.689	78.673	-0.390	0.698
age_yr	-58.194	31.440	78.059	-1.851	0.068
cebq_sr	-117.707	30.514	78.106	-3.857	0.000
avg_vas	54.511	19.796	310.431	2.754	0.006
meal_order	3.705	5.663	252.792	0.654	0.514
risk_status_momHigh Risk	7.108	45.181	107.621	0.157	0.875
ps_prop	147.808	22.463	252.262	6.580	0.000
risk_status_momHigh Risk:ps_prop	-70.873	34.706	252.484	-2.042	0.042

Figure 2: kCal Consumed: Risk Status x Portion Size

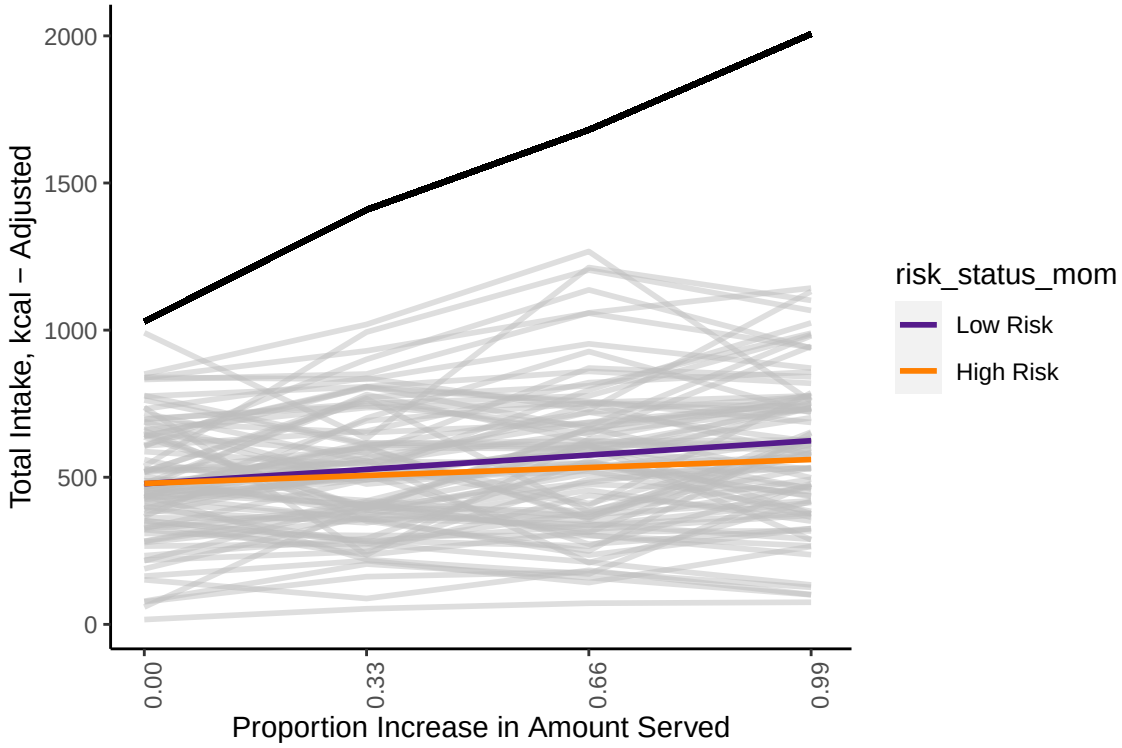


Table 17: Estimated Simple Slopes: Risk Status x Linear Portion Size for kcal

risk_status_mom	ps_prop.trend	SE	df	t.ratio	p.value
Low Risk	147.808	22.463	253.451	6.580	0.000
High Risk	76.935	26.473	253.545	2.906	0.004

Table 18: Estimated Marginal Means: Risk Status x Portion Size for kcal

	Low Risk	High Risk
0	477.751	481.283
0.33	525.964	506.563
0.66	577.110	525.195
0.99	623.104	565.223

```
    Welch Two Sample t-test

data:  kcal_pred_rxps by risk_status_mom
t = -0.082564, df = 73.092, p-value = 0.9344
alternative hypothesis: true difference in means between group Low Risk and group High Risk is not equal
95 percent confidence interval:
 -88.77734  81.71419
sample estimates:
```

```
 mean in group Low Risk mean in group High Risk
              477.7512                481.2828


    Welch Two Sample t-test

data:  kcal_pred_rxps by risk_status_mom
t = 0.46488, df = 73.817, p-value = 0.6434
alternative hypothesis: true difference in means between group Low Risk and group High Risk is not equal
95 percent confidence interval:
 -63.75881 102.56135
sample estimates:
 mean in group Low Risk mean in group High Risk
              525.9643                506.5631


    Welch Two Sample t-test

data:  kcal_pred_rxps by risk_status_mom
t = 1.1798, df = 70.911, p-value = 0.242
alternative hypothesis: true difference in means between group Low Risk and group High Risk is not equal
95 percent confidence interval:
 -35.82425 139.65505
sample estimates:
 mean in group Low Risk mean in group High Risk
              577.1102                525.1948


    Welch Two Sample t-test

data:  kcal_pred_rxps by risk_status_mom
t = 1.3668, df = 75.617, p-value = 0.1757
alternative hypothesis: true difference in means between group Low Risk and group High Risk is not equal
95 percent confidence interval:
 -26.47015 142.23164
sample estimates:
 mean in group Low Risk mean in group High Risk
              623.1035                565.2228
```

3.4.2.1 No Plate Cleaners

Table 19: Regression Table: No Plate Cleaners - Risk x Portion Size for kcal

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	482.921	364.151	79.832	1.326	0.189
preFF	-0.883	0.289	319.094	-3.055	0.002
bmi	33.161	15.818	76.629	2.096	0.039
sexFemale	-8.119	39.111	76.595	-0.208	0.836
age_yr	-49.225	32.366	75.930	-1.521	0.132
cebq_sr	-106.411	31.998	76.023	-3.326	0.001
avg_vas	50.994	19.868	302.776	2.567	0.011
meal_order	1.655	5.670	246.627	0.292	0.771
risk_status_momHigh Risk	3.819	45.877	103.776	0.083	0.934
ps_prop	150.398	22.448	246.263	6.700	0.000
risk_status_momHigh Risk:ps_prop	-73.870	34.774	246.508	-2.124	0.035

3.5 Exploratory Analyses: Effect of BMI

After controlling for age and sex, there was a difference in BMI by Risk Status such that the High Risk group had BMI that was 0.73 higher on average.

Table 20: Regression Table: BMI and Risk Status

	Estimate	Std. Error	t value	Pr(>|t|)
(Intercept)	14.008	1.757	7.972	0.000
age_yr	0.184	0.225	0.816	0.417
sexFemale	0.007	0.277	0.024	0.981
risk_status_momHigh Risk	0.794	0.280	2.841	0.006

Since BMI was associated with both total grams and kcal intake, I tested if adding a BMI x Poriton Size interaction improved the model.

3.5.1 Grams

Adding a BMI x Portion Size interaction did not improve the model for grams

```
Data: intake_long
Models:
grams_psxrisk_mod: grams ~ preFF + bmi + sex + age_yr + cebq_sr + avg_vas + meal_order + risk_status_mo
grams_psxrisk_psxbmi_mod: grams ~ preFF + bmi + sex + age_yr + cebq_sr + avg_vas + meal_order + risk_st
                          npar    AIC    BIC  logLik deviance  Chisq Df
grams_psxrisk_mod           13 4254.5 4304.4 -2114.3   4228.5
grams_psxrisk_psxbmi_mod    14 4256.4 4310.2 -2114.2   4228.4 0.1023  1
                          Pr(>Chisq)
grams_psxrisk_mod
grams_psxrisk_psxbmi_mod     0.7491
```

3.5.2 kcal

Adding a BMI x Portion Size interaction did not improve the model for kcal.

Data: intake_long Models: kcal_psxrisk_mod: kcal ~ preFF + bmi + sex + age_yr + cebq_sr + avg_vas + meal_order + risk_status_mom * ps_prop + (1 | sub) kcal_psxrisk_psxbmi_mod: kcal ~ preFF + bmi + sex + age_yr + cebq_sr + avg_vas + meal_order + risk_status_mom * ps_prop + bmi * ps_prop + (1 | sub) npar AIC BIC logLik deviance Chisq Df Pr(>Chisq) kcal_psxrisk_mod 13 4455.8 4505.7 -2214.9 4429.8 kcal_psxrisk_psxbmi_mod 14 4455.7 4509.5 -2213.9 4427.7 2.046 1 0.1526

4 Exploratory Analyses: Individual Foods

4.1 Chicken Nuggets

4.1.1 Grams

4.1.1.1 Base Model The difference between models with and without quadratic effect was not significant indicating the added model parameters/complexity did not improve model fit. Should only model chicken nugget gram intake with linear effect.

```
Data: intake_long
Models:
grams_chnug_ps_mod: chnug_grams ~ preFF + bmi + sex + age_yr + cebq_sr + chnug_vas + meal_order + ps_pr
grams_chnug_ps_psquad_mod: chnug_grams ~ preFF + bmi + sex + age_yr + cebq_sr + chnug_vas + meal_order +
                          npar    AIC    BIC  logLik deviance  Chisq Df
grams_chnug_ps_mod          11 3508.9 3551.2 -1743.5   3486.9
grams_chnug_ps_psquad_mod   12 3510.6 3556.7 -1743.3   3486.6 0.2814  1
                          Pr(>Chisq)
grams_chnug_ps_mod
grams_chnug_ps_psquad_mod     0.5958
```

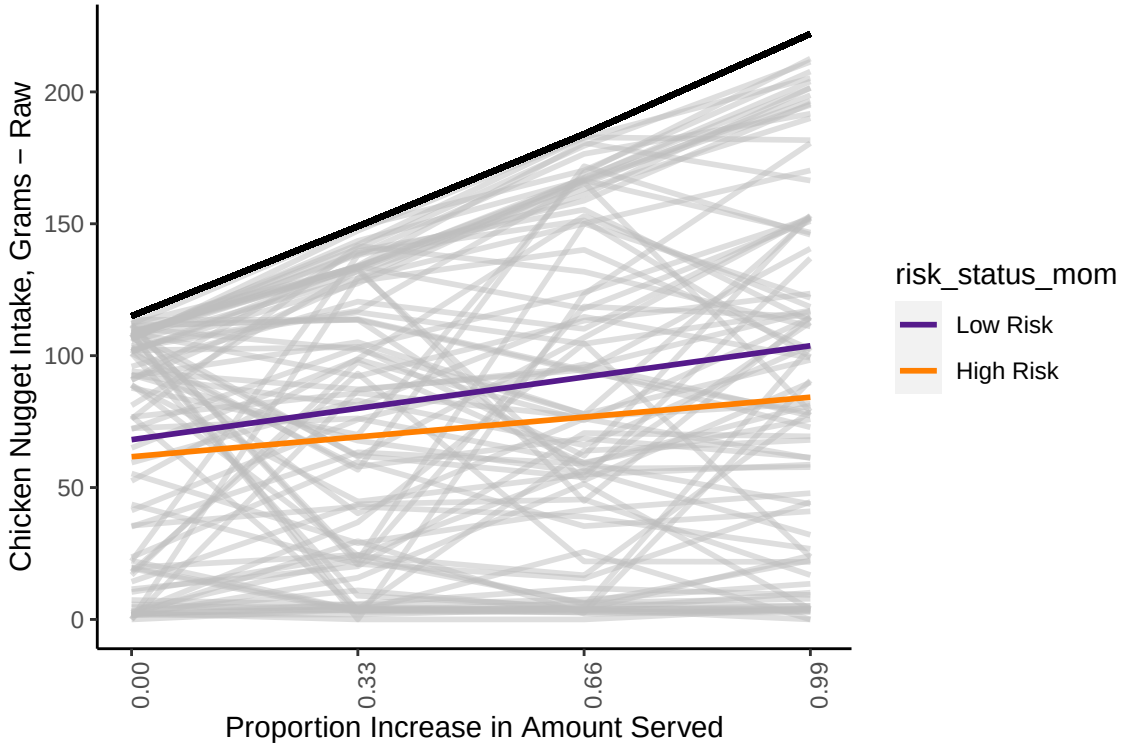
Table 21: Chicken Nugget - Portion Size for Grams

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	29.789	80.022	74.312	0.372	0.711
preFF	-0.214	0.074	334.475	-2.909	0.004
bmi	4.207	3.342	71.386	1.259	0.212
sexFemale	-13.502	8.714	71.106	-1.549	0.126
age_yr	-7.990	7.137	71.286	-1.120	0.267
cebq_sr	-11.151	6.797	71.337	-1.641	0.105
chnug_vas	17.939	3.311	315.760	5.418	0.000
meal_order	1.311	1.489	245.142	0.881	0.379
ps_prop	29.889	4.499	244.045	6.643	0.000

4.1.1.2 Risk x Portion Size

Table 22: Chicken Nugget - Risk x Portion Size for Grams

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	5.787	80.814	73.601	0.072	0.943
preFF	-0.211	0.074	332.237	-2.860	0.005
bmi	5.890	3.508	70.885	1.679	0.098
sexFemale	-11.959	8.720	70.345	-1.371	0.175
age_yr	-8.820	7.110	70.426	-1.240	0.219
cebq_sr	-9.026	6.894	70.316	-1.309	0.195
chnug_vas	17.877	3.298	312.486	5.420	0.000
meal_order	1.346	1.485	244.269	0.906	0.366
ps_prop	35.695	5.882	243.198	6.069	0.000
risk_status_momHigh Risk	-7.236	10.453	107.589	-0.692	0.490
ps_prop:risk_status_momHigh Risk	-13.836	9.088	243.500	-1.522	0.129



4.1.2 kcal

4.1.2.1 Base Model The difference between models with and without quadratic effect was not significant indicating the added model parameters/complexity did not improve model fit. Should only model chicken nugget kcal intake with linear effect.

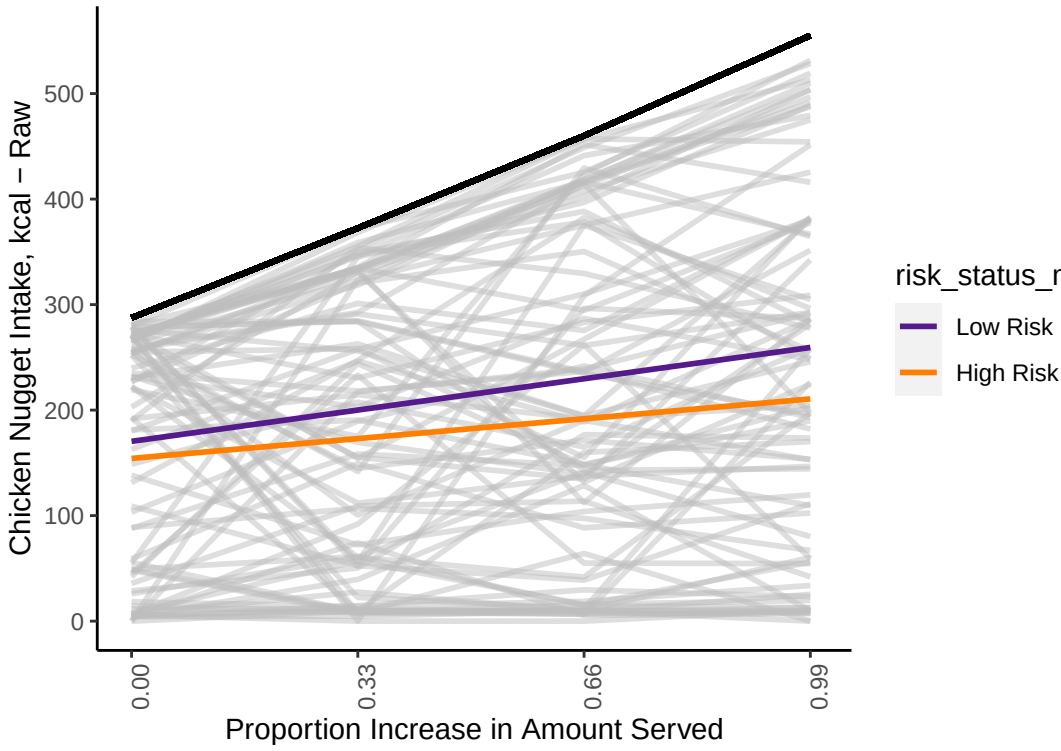
```
Data: intake_long
Models:
kcal_chnug_ps_mod: chnug_kcal ~ preFF + bmi + sex + age_yr + cebq_sr + chnug_vas + meal_order + ps_prop
kcal_chnug_ps_psquad_mod: chnug_kcal ~ preFF + bmi + sex + age_yr + cebq_sr + chnug_vas + meal_order + p
                         npar    AIC    BIC  logLik deviance  Chisq Df
kcal_chnug_ps_mod          11 4139.3 4181.6 -2058.7   4117.3
kcal_chnug_ps_psquad_mod   12 4141.0 4187.1 -2058.5   4117.0 0.2814  1
                         Pr(>Chisq)
kcal_chnug_ps_mod
kcal_chnug_ps_psquad_mod     0.5958
```

Table 23: Chicken - Nugget Portion Size for kcal

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	74.473	200.056	74.312	0.372	0.711
preFF	-0.535	0.184	334.475	-2.909	0.004
bmi	10.517	8.356	71.386	1.259	0.212
sexFemale	-33.754	21.785	71.106	-1.549	0.126
age_yr	-19.975	17.843	71.286	-1.120	0.267
cebq_sr	-27.878	16.993	71.337	-1.641	0.105
chnug_vas	44.847	8.278	315.760	5.418	0.000
meal_order	3.279	3.723	245.142	0.881	0.379
ps_prop	74.722	11.248	244.045	6.643	0.000

Table 24: Chicken - Nugget Risk x Portion Size for kcal

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	14.468	202.035	73.601	0.072	0.943
preFF	-0.528	0.184	332.237	-2.860	0.005
bmi	14.724	8.770	70.885	1.679	0.098
sexFemale	-29.896	21.800	70.345	-1.371	0.175
age_yr	-22.049	17.776	70.426	-1.240	0.219
cebq_sr	-22.566	17.236	70.316	-1.309	0.195
chnug_vas	44.693	8.246	312.486	5.420	0.000
meal_order	3.365	3.713	244.269	0.906	0.366
ps_prop	89.237	14.705	243.198	6.069	0.000
risk_status_momHigh Risk	-18.091	26.134	107.589	-0.692	0.490
ps_prop:risk_status_momHigh Risk	-34.590	22.721	243.500	-1.522	0.129



4.1.2.2 Risk x Portion Size

4.2 Mac and Cheese

4.2.1 Grams

4.2.1.1 Base Model The difference between models with and without quadratic effect was not significant indicating the added model parameters/complexity did not improve model fit. Should only model chicken nugget gram intake with linear effect.

```
Data: intake_long
Models:
grams_mac_ps_mod: mac_grams ~ preFF + bmi + sex + age_yr + cebq_sr + mac_vas + meal_order + ps_prop + (
grams_mac_ps_psquad_mod: mac_grams ~ preFF + bmi + sex + age_yr + cebq_sr + mac_vas + meal_order + ps_p
                        npar    AIC    BIC  logLik deviance Chisq Df Pr(>Chisq)
grams_mac_ps_mod          11 3850.8 3893.1 -1914.4   3828.8
grams_mac_ps_psquad_mod   12 3851.8 3897.9 -1913.9   3827.8 0.979  1     0.3224
```

Table 25: Mac and Cheese - Portion Size for Grams

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	233.348	171.571	76.877	1.360	0.178
preFF	-0.117	0.117	310.347	-0.993	0.321
bmi	12.913	7.265	76.887	1.777	0.079
sexFemale	11.601	18.940	76.475	0.613	0.542
age_yr	-32.364	15.466	76.001	-2.093	0.040
cebq_sr	-51.125	14.725	75.954	-3.472	0.001
mac_vas	21.635	4.567	329.059	4.737	0.000
meal_order	2.282	2.222	249.352	1.027	0.305
ps_prop	16.150	6.737	249.408	2.397	0.017

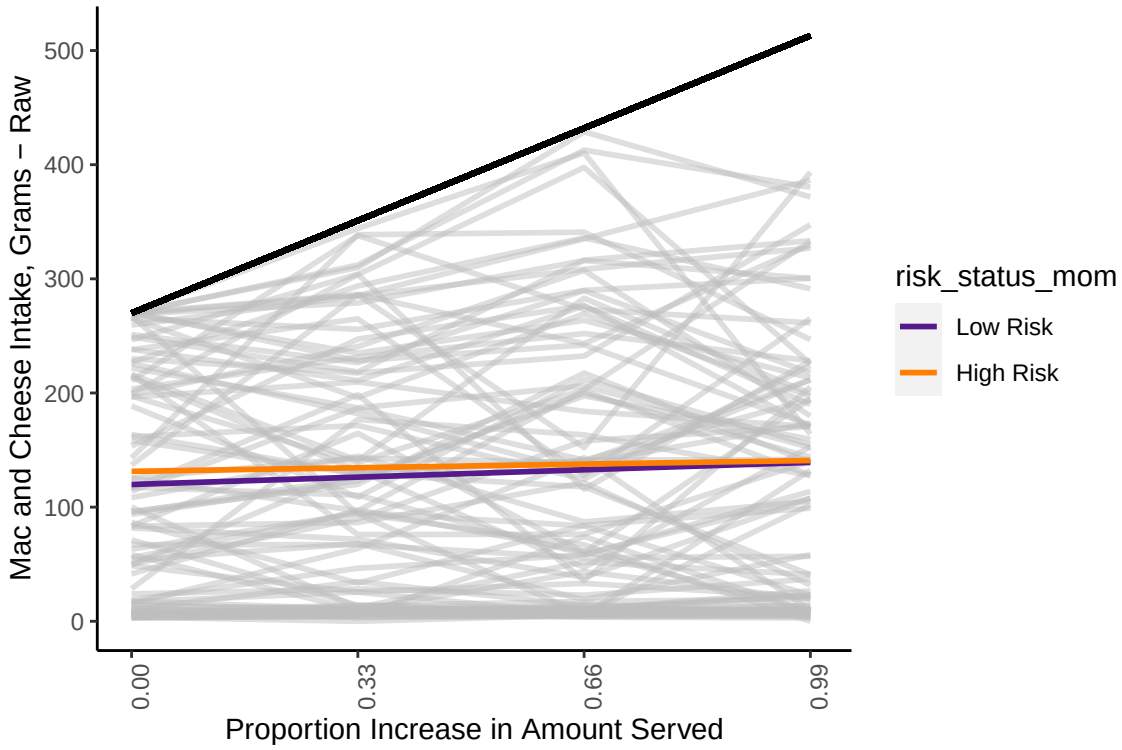
Table 26: Mac and Cheese - Risk x Portion Size for Grams

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	234.334	175.744	76.092	1.333	0.186
preFF	-0.120	0.118	307.064	-1.015	0.311
bmi	12.840	7.720	75.902	1.663	0.100
sexFemale	11.560	19.211	75.480	0.602	0.549
age_yr	-32.329	15.625	75.018	-2.069	0.042
cebq_sr	-51.241	15.154	74.918	-3.381	0.001
mac_vas	21.379	4.606	327.256	4.642	0.000
meal_order	2.297	2.226	248.348	1.032	0.303
ps_prop	18.148	8.853	248.608	2.050	0.041
risk_status_momHigh Risk	3.182	21.853	93.587	0.146	0.885
ps_prop:risk_status_momHigh Risk	-4.798	13.739	249.669	-0.349	0.727

4.2.1.2 Risk x Portion Size The interaction between Risk Status and Portion Size was not significant so it was removed from the model.

Table 27: Mac and Cheese - Risk x Portion Size for Grams

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	234.743	175.621	76.179	1.337	0.185
preFF	-0.117	0.118	307.847	-0.994	0.321
bmi	12.836	7.714	75.998	1.664	0.100
sexFemale	11.542	19.198	75.576	0.601	0.549
age_yr	-32.328	15.614	75.115	-2.070	0.042
cebq_sr	-51.238	15.143	75.015	-3.384	0.001
mac_vas	21.533	4.575	327.886	4.707	0.000
meal_order	2.283	2.222	249.439	1.027	0.305
ps_prop	16.146	6.736	249.492	2.397	0.017
risk_status_momHigh Risk	0.750	20.699	75.790	0.036	0.971



4.2.2 kcal

4.2.2.1 Base Model The difference between models with and without quadratic effect was not significant indicating the added model parameters/complexity did not improve model fit. Should only model chicken nugget kcal intake with linear effect.

```
Data: intake_long
Models:
kcal_mac_ps_mod: mac_kcal ~ preFF + bmi + sex + age_yr + mac_vas + cebq_sr + meal_order + ps_prop + (1
kcal_mac_ps_psquad_mod: mac_kcal ~ preFF + bmi + sex + age_yr + cebq_sr + mac_vas + meal_order + ps_pro
                        npar    AIC    BIC  logLik deviance Chisq Df Pr(>Chisq)
kcal_mac_ps_mod           11 4215.9 4258.1 -2096.9   4193.9
kcal_mac_ps_psquad_mod    12 4216.9 4263.0 -2096.4   4192.9 0.979  1     0.3224
```

Table 28: Mac and Cheese - Portion Size for kcal

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	396.692	291.671	76.877	1.360	0.178
preFF	-0.198	0.199	310.347	-0.993	0.321
bmi	21.952	12.350	76.887	1.777	0.079
sexFemale	19.721	32.197	76.475	0.613	0.542
age_yr	-55.019	26.291	76.001	-2.093	0.040
mac_vas	36.780	7.764	329.059	4.737	0.000
cebq_sr	-86.912	25.032	75.954	-3.472	0.001
meal_order	3.880	3.778	249.352	1.027	0.305
ps_prop	27.454	11.453	249.408	2.397	0.017

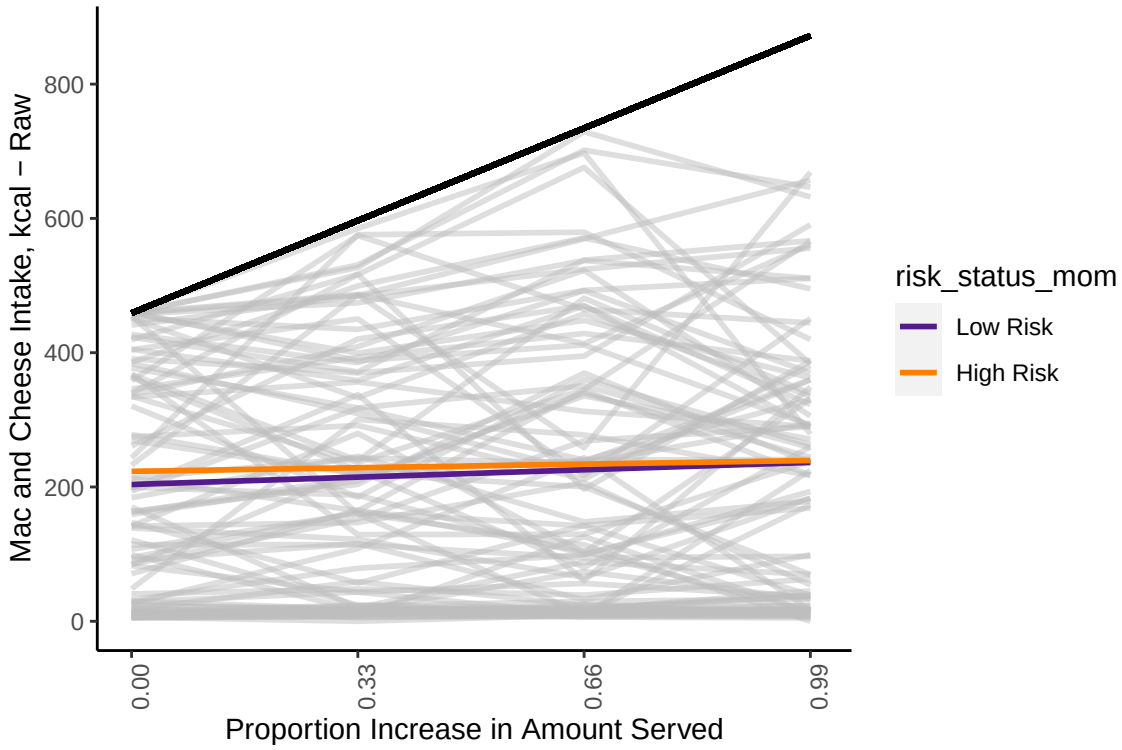
Table 29: Mac and Cheese - Risk x Portion Size for kcal

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	398.367	298.765	76.092	1.333	0.186
preFF	-0.204	0.201	307.064	-1.015	0.311
bmi	21.828	13.123	75.901	1.663	0.100
sexFemale	19.652	32.659	75.480	0.602	0.549
age_yr	-54.960	26.562	75.018	-2.069	0.042
cebq_sr	-87.110	25.761	74.918	-3.381	0.001
mac_vas	36.345	7.830	327.256	4.642	0.000
meal_order	3.904	3.784	248.348	1.032	0.303
ps_prop	30.852	15.050	248.608	2.050	0.041
risk_status_momHigh Risk	5.409	37.151	93.587	0.146	0.885
ps_prop:risk_status_momHigh Risk	-8.156	23.356	249.669	-0.349	0.727

4.2.2.2 Risk x Portion Size The interaction between Risk Status and Portion Size was not significant so it was removed from the model.

Table 30: Mac and Cheese - Risk x Portion Size for kcal

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	399.064	298.556	76.179	1.337	0.185
preFF	-0.199	0.200	307.847	-0.994	0.321
bmi	21.821	13.114	75.998	1.664	0.100
sexFemale	19.622	32.636	75.576	0.601	0.549
age_yr	-54.957	26.544	75.115	-2.070	0.042
cebq_sr	-87.104	25.744	75.015	-3.384	0.001
mac_vas	36.606	7.778	327.886	4.707	0.000
meal_order	3.881	3.778	249.439	1.027	0.305
ps_prop	27.449	11.452	249.492	2.397	0.017
risk_status_momHigh Risk	1.275	35.188	75.790	0.036	0.971



4.3 Grapes

4.3.1 Grams

4.3.1.1 Base Model The difference between models with and without quadratic effect was not significant indicating the added model parameters/complexity did not improve model fit. Should only model chicken nugget gram intake with linear effect.

```
Data: intake_long
Models:
grams_grape_ps_mod: grape_grams ~ preFF + bmi + sex + age_yr + cebq_sr + grape_vas + meal_order + ps_pr
grams_grape_ps_psquad_mod: grape_grams ~ preFF + bmi + sex + age_yr + cebq_sr + grape_vas + meal_order +
                          npar    AIC    BIC  logLik deviance  Chisq Df
grams_grape_ps_mod          11 3739.5 3781.7 -1858.7   3717.5
grams_grape_ps_psquad_mod   12 3741.4 3787.5 -1858.7   3717.4 0.0106  1
                          Pr(>Chisq)
grams_grape_ps_mod
grams_grape_ps_psquad_mod     0.9179
```

Table 31: Grapes - Portion Size for Grams

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	68.593	151.670	76.184	0.452	0.652
preFF	-0.058	0.099	305.768	-0.588	0.557
bmi	-9.059	6.407	75.600	-1.414	0.162
sexFemale	-10.045	16.734	75.659	-0.600	0.550
age_yr	23.039	13.674	75.337	1.685	0.096
cebq_sr	-11.878	13.077	76.434	-0.908	0.367
grape_vas	9.859	4.185	323.249	2.356	0.019
meal_order	-5.167	1.866	248.615	-2.769	0.006
ps_prop	18.675	5.656	248.610	3.302	0.001

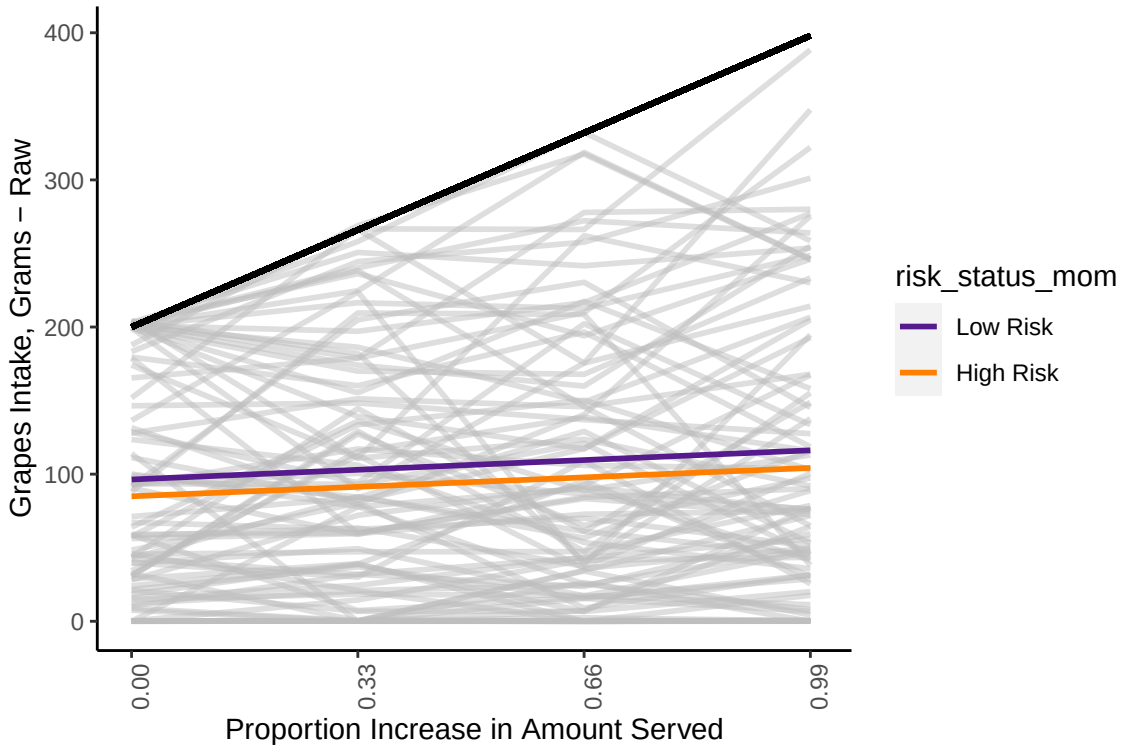
Table 32: Grapes - Risk x Portion Size for Grams

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	67.207	155.119	75.441	0.433	0.666
preFF	-0.060	0.100	302.512	-0.598	0.550
bmi	-9.023	6.803	74.860	-1.326	0.189
sexFemale	-10.028	16.950	74.741	-0.592	0.556
age_yr	23.018	13.794	74.416	1.669	0.099
cebq_sr	-11.843	13.428	75.275	-0.882	0.381
grape_vas	9.940	4.220	321.743	2.356	0.019
meal_order	-5.159	1.870	247.649	-2.759	0.006
ps_prop	20.120	7.445	248.015	2.702	0.007
risk_status_momHigh Risk	1.349	19.159	90.590	0.070	0.944
ps_prop:risk_status_momHigh Risk	-3.455	11.543	248.650	-0.299	0.765

4.3.1.2 Risk x Portion Size The interaction between Risk Status and Portion Size was not significiant so it was removed from the model.

Table 33: Grapes - Risk x Portion Size for Grams

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	68.214	155.225	75.454	0.439	0.662
preFF	-0.058	0.099	303.404	-0.581	0.561
bmi	-9.009	6.809	74.927	-1.323	0.190
sexFemale	-9.985	16.965	74.807	-0.589	0.558
age_yr	23.021	13.806	74.489	1.667	0.100
cebq_sr	-11.797	13.440	75.337	-0.878	0.383
grape_vas	9.769	4.190	322.226	2.331	0.020
meal_order	-5.167	1.866	248.725	-2.769	0.006
ps_prop	18.675	5.655	248.719	3.302	0.001
risk_status_momHigh Risk	-0.370	18.293	75.040	-0.020	0.984



4.3.2 kcal

4.3.2.1 Base Model The difference between models with and without quadratic effect was not significant indicating the added model parameters/complexity did not improve model fit. Should only model chicken nugget kcal intake with linear effect.

```
Data: intake_long
Models:
kcal_grape_ps_mod: grape_kcal ~ preFF + bmi + sex + age_yr + cebq_sr + grape_vas + meal_order + ps_prop
kcal_grape_ps_psquad_mod: grape_kcal ~ preFF + bmi + sex + age_yr + cebq_sr + grape_vas + meal_order + p
                          npar    AIC    BIC  logLik deviance  Chisq Df
kcal_grape_ps_mod           11 3489.1 3531.4 -1733.6   3467.1
kcal_grape_ps_psquad_mod    12 3491.1 3537.2 -1733.6   3467.1 0.0106  1
                          Pr(>Chisq)
kcal_grape_ps_mod
kcal_grape_ps_psquad_mod     0.9179
```

Table 34: Grapes - Portion Size for kcal

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	47.672	105.411	76.184	0.452	0.652
preFF	-0.040	0.069	305.768	-0.588	0.557
bmi	-6.296	4.453	75.600	-1.414	0.162
sexFemale	-6.981	11.630	75.659	-0.600	0.550
age_yr	16.012	9.503	75.337	1.685	0.096
cebq_sr	-8.255	9.088	76.434	-0.908	0.367
grape_vas	6.852	2.909	323.249	2.356	0.019
meal_order	-3.591	1.297	248.615	-2.769	0.006
ps_prop	12.979	3.931	248.610	3.302	0.001

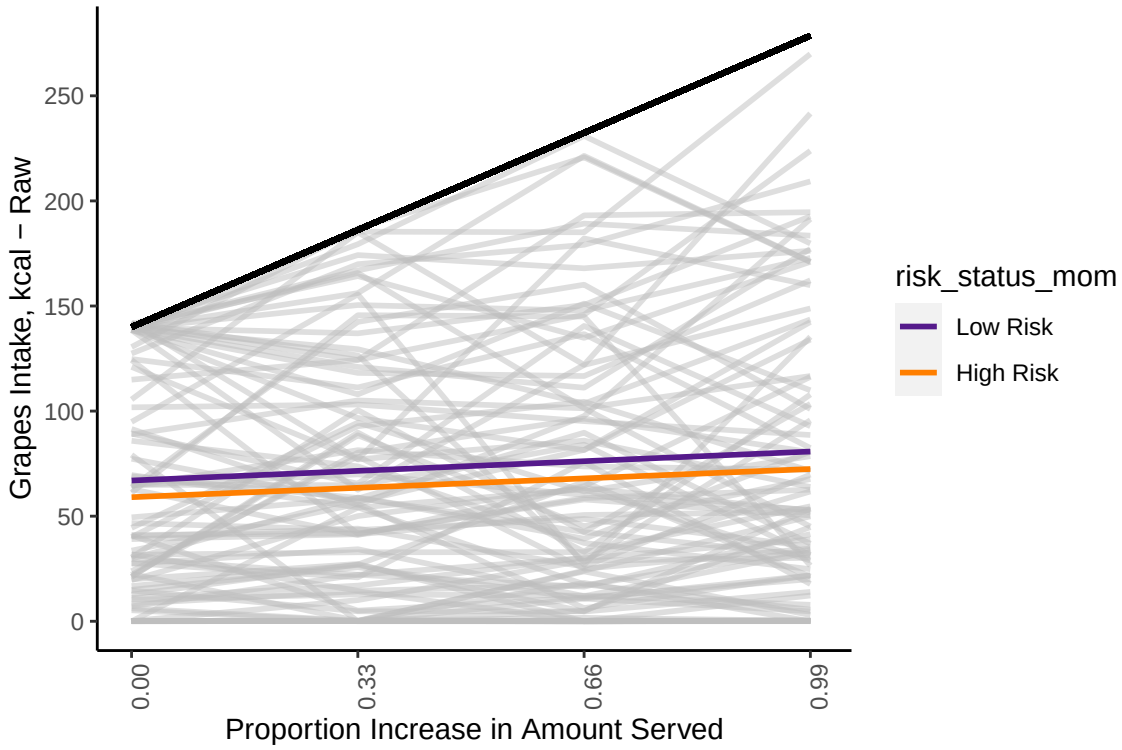
Table 35: Grapes - Risk x Portion Size for kcal

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	46.709	107.807	75.441	0.433	0.666
preFF	-0.041	0.069	302.512	-0.598	0.550
bmi	-6.271	4.728	74.860	-1.326	0.189
sexFemale	-6.969	11.780	74.741	-0.592	0.556
age_yr	15.997	9.587	74.416	1.669	0.099
cebq_sr	-8.231	9.333	75.275	-0.882	0.381
grape_vas	6.908	2.933	321.743	2.356	0.019
meal_order	-3.586	1.300	247.649	-2.759	0.006
ps_prop	13.984	5.175	248.015	2.702	0.007
risk_status_momHigh Risk	0.938	13.316	90.590	0.070	0.944
ps_prop:risk_status_momHigh Risk	-2.401	8.023	248.650	-0.299	0.765

4.3.2.2 Risk x Portion Size The interaction between Risk Status and Portion Size was not significant so it was removed from the model.

Table 36: Grapes - Risk x Portion Size for kcal

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	47.409	107.882	75.455	0.439	0.662
preFF	-0.040	0.069	303.404	-0.581	0.561
bmi	-6.262	4.733	74.927	-1.323	0.190
sexFemale	-6.940	11.791	74.807	-0.589	0.558
age_yr	15.999	9.596	74.489	1.667	0.100
cebq_sr	-8.199	9.341	75.337	-0.878	0.383
grape_vas	6.789	2.912	322.226	2.331	0.020
meal_order	-3.591	1.297	248.725	-2.769	0.006
ps_prop	12.979	3.930	248.719	3.302	0.001
risk_status_momHigh Risk	-0.257	12.714	75.040	-0.020	0.984



4.4 Broccoli

4.4.1 Grams

4.4.1.1 Base Model The difference between models with and without quadratic effect was not significant indicating the added model parameters/complexity did not improve model fit. Should only model chicken nugget gram intake with linear effect.

```
Data: intake_long
Models:
grams_broc_ps_mod: broc_grams ~ preFF + bmi + sex + age_yr + cebq_sr + broc_vas + meal_order + ps_prop +
grams_broc_ps_psquad_mod: broc_grams ~ preFF + bmi + sex + age_yr + cebq_sr + broc_vas + meal_order + ps
                         npar    AIC    BIC  logLik deviance  Chisq Df
grams_broc_ps_mod          11 3444.5 3486.8 -1711.3   3422.5
grams_broc_ps_psquad_mod   12 3445.8 3491.9 -1710.9   3421.8 0.7715  1
                         Pr(>Chisq)
grams_broc_ps_mod
grams_broc_ps_psquad_mod     0.3797
```

Table 37: Broccoli - Portion Size for Grams

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	-63.830	86.368	71.997	-0.739	0.462
preFF	0.008	0.066	321.770	0.116	0.908
bmi	-1.264	3.638	71.018	-0.347	0.729
sexFemale	9.429	9.484	70.770	0.994	0.324
age_yr	14.050	7.750	70.500	1.813	0.074
cebq_sr	-1.137	7.389	70.761	-0.154	0.878
broc_vas	1.280	2.320	287.682	0.552	0.582
meal_order	-1.106	1.274	243.932	-0.868	0.387
ps_prop	1.268	3.866	244.203	0.328	0.743

Table 38: brocs - Risk x Portion Size for Grams

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	-71.439	88.487	70.906	-0.807	0.422
preFF	0.001	0.066	317.467	0.017	0.986
bmi	-0.836	3.873	70.129	-0.216	0.830
sexFemale	9.907	9.644	69.940	1.027	0.308
age_yr	13.868	7.843	69.522	1.768	0.081
cebq_sr	-0.576	7.612	69.578	-0.076	0.940
broc_vas	0.943	2.323	289.836	0.406	0.685
meal_order	-1.059	1.266	242.904	-0.836	0.404
ps_prop	7.819	5.032	243.345	1.554	0.122
risk_status_momHigh Risk	3.669	11.111	91.839	0.330	0.742
ps_prop:risk_status_momHigh Risk	-15.580	7.766	243.044	-2.006	0.046

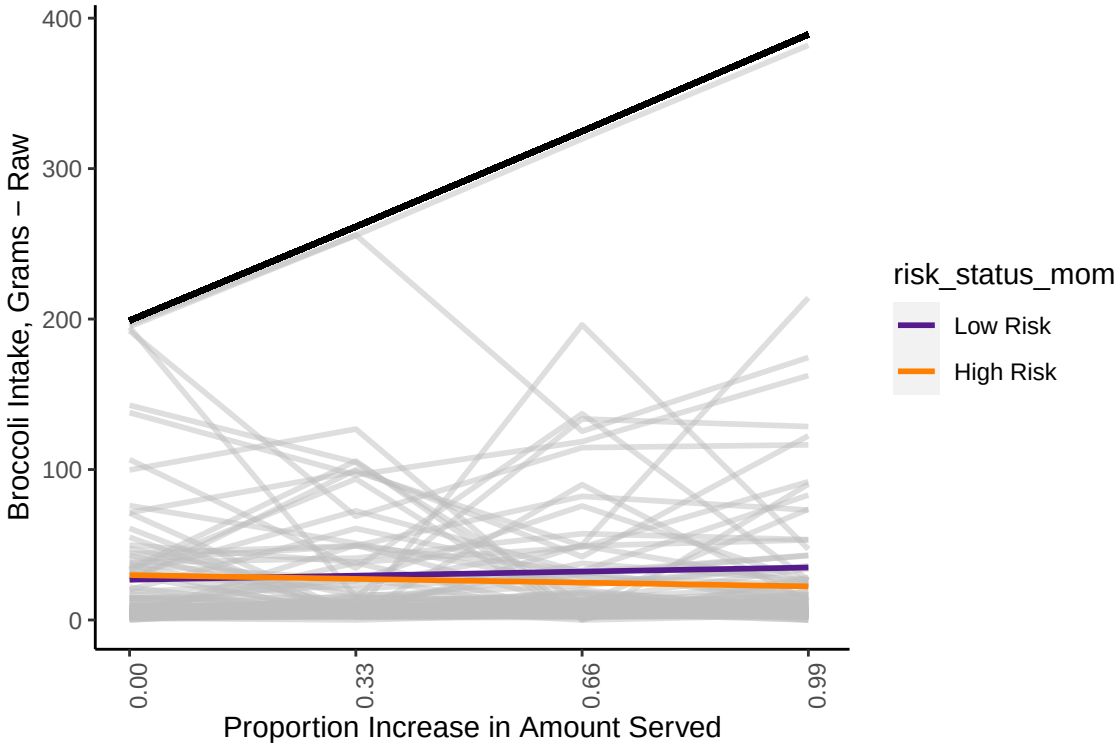
4.4.1.2 Risk x Portion Size Unlike other models, none of the control variables were associated with broccoli intake.

There was a significant interaction between Risk Status and Portion Size.

Table 39: Estimated Simple Slopes: Risk Status x Portion Size for Broccoli grams

risk_status_mom	ps_prop.trend	SE	df	t.ratio	p.value
Low Risk	7.819	5.032	253.961	1.554	0.121
High Risk	-7.762	5.925	253.503	-1.310	0.191

contrast	estimate	SE	df	t.ratio	p.value
Low Risk - High Risk	15.58	7.766	253.684	2.006	0.046



4.4.2 kcal

4.4.2.1 Base Model The difference between models with and without quadratic effect was not significant indicating the added model parameters/complexity did not improve model fit. Should only model chicken nugget kcal intake with linear effect.

```
Data: intake_long
Models:
kcal_broc_ps_mod: broc_kcal ~ preFF + bmi + sex + cebq_sr + broc_vas + age_yr + meal_order + ps_prop +
kcal_broc_ps_psquad_mod: broc_kcal ~ preFF + bmi + sex + age_yr + cebq_sr + broc_vas + meal_order + ps_
                        npar    AIC    BIC  logLik deviance  Chisq Df
kcal_broc_ps_mod          11 3446.6 3488.8 -1712.3   3424.6
kcal_broc_ps_psquad_mod   12 3447.8 3493.9 -1711.9   3423.8 0.7715  1
                        Pr(>Chisq)
kcal_broc_ps_mod
kcal_broc_ps_psquad_mod     0.3797
```

Table 40: Broccoli - Portion Size for kcal

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	-64.022	86.627	71.997	-0.739	0.462
preFF	0.008	0.066	321.770	0.116	0.908
bmi	-1.268	3.649	71.018	-0.347	0.729
sexFemale	9.457	9.512	70.770	0.994	0.324
cebq_sr	-1.141	7.411	70.761	-0.154	0.878
broc_vas	1.284	2.327	287.682	0.552	0.582
age_yr	14.093	7.773	70.500	1.813	0.074
meal_order	-1.109	1.278	243.932	-0.868	0.387
ps_prop	1.272	3.877	244.203	0.328	0.743

Table 41: brocs - Risk x Portion Size for kcal

	Estimate	Std. Error	df	t value	Pr(>|t|)
(Intercept)	-71.654	88.752	70.906	-0.807	0.422
preFF	0.001	0.066	317.467	0.017	0.986
bmi	-0.839	3.885	70.129	-0.216	0.830
sexFemale	9.937	9.673	69.940	1.027	0.308
age_yr	13.910	7.867	69.522	1.768	0.081
cebq_sr	-0.578	7.635	69.578	-0.076	0.940
broc_vas	0.946	2.330	289.836	0.406	0.685
meal_order	-1.062	1.269	242.904	-0.836	0.404
ps_prop	7.842	5.047	243.345	1.554	0.122
risk_status_momHigh Risk	3.680	11.144	91.839	0.330	0.742
ps_prop:risk_status_momHigh Risk	-15.627	7.790	243.044	-2.006	0.046

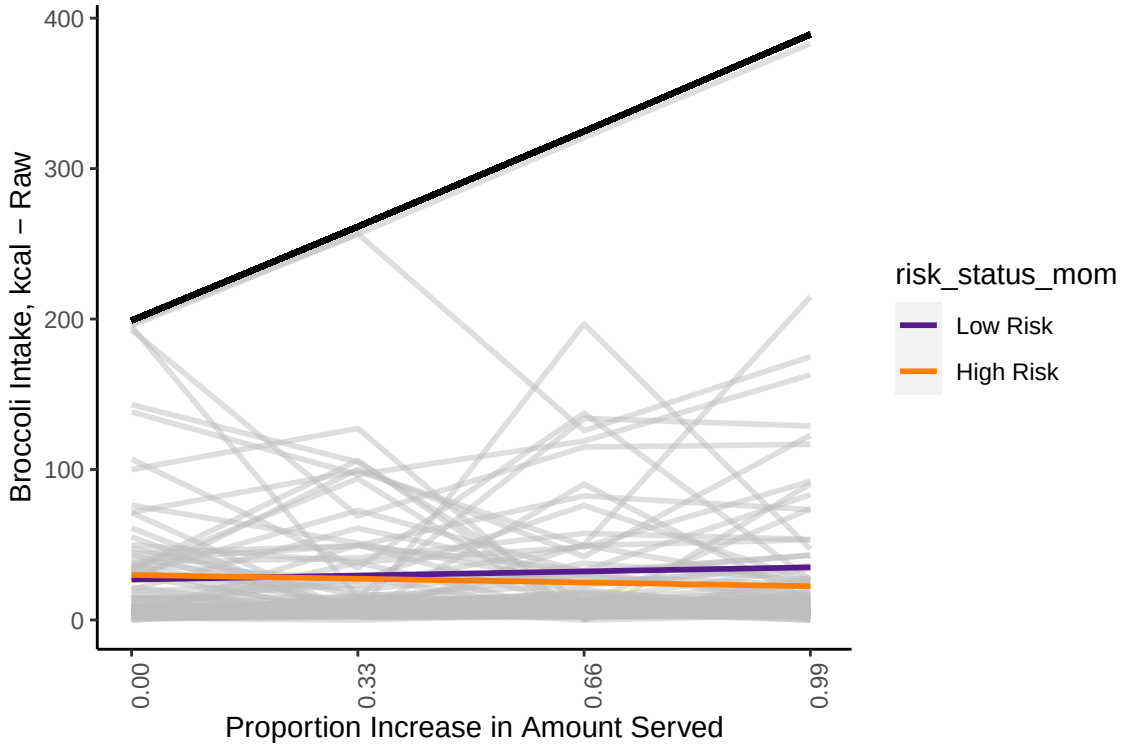
4.4.2.2 Risk x Portion Size Unlike other models, none of the control variables were associated with broccoli intake.

There was a significant interaction between Risk Status and Portion Size.

Table 42: Estimated Simple Slopes: Risk Status x Portion Size for Broccoli kcal

risk_status_mom	ps_prop.trend	SE	df	t.ratio	p.value
Low Risk	7.842	5.047	253.961	1.554	0.121
High Risk	-7.785	5.943	253.503	-1.310	0.191

contrast	estimate	SE	df	t.ratio	p.value
Low Risk - High Risk	15.627	7.79	253.684	2.006	0.046



5 Exploratory Analyses: Mediated Moderation

Since broccoli was the only food showing a Risk Status x Portion Size interaction, I tested whether broccoli intake mediates the overall Risk x Potion Size interaction using a mediated moderation model.

5.1 Grams

```
lavaan 0.6-12 ended normally after 149 iterations

  Estimator                                         ML
  Optimization method                           NLMINB
  Number of model parameters                        26

  Number of observations                           344
  Number of clusters [sub]                          86

Model Test User Model:
                                              Standard      Robust
  Test Statistic                                10.786       4.956
  Degrees of freedom                                 3           3
  P-value (Chi-square)                           0.013       0.175
  Scaling correction factor                                  2.176
    Yuan-Bentler correction (Mplus variant)
  Information                                 Observed

Parameter Estimates:

  Standard errors                           Robust.cluster
  Information                                     Expected
  Information saturated (h1) model          Structured

Regressions:
                   Estimate   Std.Err  z-value  P(>|z|)
  grams ~
    sub              -0.325    0.323   -1.004    0.315
    preFF            -0.996    0.320   -3.115    0.002
    bmi              18.698   10.922    1.712    0.087
    sex             -35.195   29.546   -1.191    0.234
    age_yr          -43.664   20.271   -2.154    0.031
    cebq_sr         -87.590   21.695   -4.037    0.000
    avg_vas          58.006   24.524    2.365    0.018
    meal_order       -4.726    4.341   -1.088    0.276
    rsk_stts_m       -4.773   34.350   -0.139    0.889
    ps_prop          75.545   14.913    5.066    0.000
    psxrisk_nt (c)  -46.716   24.408   -1.914    0.056
  broc_grams ~
    preFF            -0.078    0.073   -1.062    0.288
    bmi              -0.398    2.457   -0.162    0.871
    sex               6.735    8.468    0.795    0.426
    age_yr           13.140    8.410    1.562    0.118
    cebq_sr           1.144    3.875    0.295    0.768
    broc_vas         12.008    2.843    4.224    0.000
```

```
    meal_order        -1.261    1.466   -0.860    0.390
    rsk_stts_m         7.565    8.648    0.875    0.382
    ps_prop            6.533    5.764    1.133    0.257
    psxrisk_nt (a)   -15.363    7.488   -2.052    0.040
  grams ~
    broc_grams (b)     1.193    0.196    6.070    0.000

Intercepts:
                   Estimate   Std.Err  z-value  P(>|z|)
   .grams            591.576  259.996    2.275    0.023
   .broc_grams      -122.070   70.433   -1.733    0.083

Variances:
                   Estimate   Std.Err  z-value  P(>|z|)
   .grams          20227.764 2068.553    9.779    0.000
   .broc_grams      2055.589  714.576    2.877    0.004

Defined Parameters:
                   Estimate   Std.Err  z-value  P(>|z|)
    ab               -18.321    9.314   -1.967    0.049
    total            -65.037   26.584   -2.446    0.014
```

There was a significant level indirect effect (p = 0.036) indicating that broccoli intake mediated the interaction between risk status and portion size for gram intake.

5.2 kcal

```
lavaan 0.6-12 ended normally after 139 iterations

  Estimator                                         ML
  Optimization method                           NLMINB
  Number of model parameters                        26

  Number of observations                           344
  Number of clusters [sub]                          86

Model Test User Model:
                                              Standard      Robust
  Test Statistic                                17.042       7.853
  Degrees of freedom                                 3           3
  P-value (Chi-square)                           0.001       0.049
  Scaling correction factor                                  2.170
    Yuan-Bentler correction (Mplus variant)
  Information                                 Observed

Parameter Estimates:

  Standard errors                          Robust.cluster
  Information                                   Expected
  Information saturated (h1) model          Structured

Regressions:
```

```
                  Estimate   Std.Err  z-value  P(>|z|)
  kcal ~
    sub              -0.082    0.465   -0.177    0.860
    preFF            -1.551    0.371   -4.182    0.000
    bmi              32.467   14.797    2.194    0.028
    sex             -37.265   37.687   -0.989    0.323
    age_yr          -74.153   27.428   -2.704    0.007
    cebq_sr        -117.122   24.910   -4.702    0.000
    avg_vas          74.543   27.752    2.686    0.007
    meal_order        4.909    5.935    0.827    0.408
    rsk_stts_m       14.209   41.394    0.343    0.731
    ps_prop         137.932   22.045    6.257    0.000
    psxrisk_nt (c)  -55.389   36.438   -1.520    0.128
  broc_kcal ~
    preFF            -0.078    0.074   -1.062    0.288
    bmi              -0.399    2.465   -0.162    0.871
    sex               6.756    8.493    0.795    0.426
    age_yr           13.179    8.435    1.562    0.118
    cebq_sr           1.147    3.887    0.295    0.768
    broc_vas         12.044    2.851    4.224    0.000
    meal_order       -1.265    1.470   -0.860    0.390
    rsk_stts_m        7.587    8.674    0.875    0.382
    ps_prop           6.553    5.781    1.133    0.257
    psxrisk_nt (a)  -15.409    7.511   -2.052    0.040
  kcal ~
    broc_kcal  (b)    1.260    0.310    4.069    0.000

Intercepts:
                  Estimate   Std.Err  z-value  P(>|z|)
   .kcal            653.614  386.457    1.691    0.091
   .broc_kcal      -122.437   70.644   -1.733    0.083

Variances:
                  Estimate   Std.Err  z-value  P(>|z|)
   .kcal           33977.227 3636.876    9.342    0.000
   .broc_kcal       2067.941  718.870    2.877    0.004

Defined Parameters:
                  Estimate   Std.Err  z-value  P(>|z|)
    ab              -19.423   10.173   -1.909    0.056
    total           -74.812   37.914   -1.973    0.048
```

There was a significant level indirect effect ($p = 0.048$) indicating that broccoli intake mediated the interaction between risk status and portion size for kcal intake.