

Supplemental Materials

Supplementary material includes another set of analyses that accounts for substance use in sample.

Supplemental Analyses Addressing Cannabis and Tobacco

Cannabis and tobacco use can be more frequent among women who are experiencing social disadvantage and/or psychological distress and both cannabis and tobacco use have been associated with reduced birthweight. Thus, cannabis and/or tobacco use might be a confound in interpreting the relationships between social advantage and birthweight. Of the 399 women in this sample, 29 women reported using 1-5 cigarettes per day, and 21 reported 6 or more cigarettes per day, which was coded as 0/1/2 for analyses. Twenty women reported using cannabis at least one time weekly, but less than once a day, while 29 women reported using cannabis at least once a day (coded 0/1/2 for analyses). Of these women, 20 reported using both tobacco and cannabis. To determine whether social disadvantage continued to predict residual birthweight even accounting for cannabis and tobacco use, we created a revised SEM model. We constructed an SEM that included this association, and which allowed us to both examine cannabis and tobacco use as part of the pathway by which Social Advantage might be linked to birthweight (e.g., an indirect pathway), versus a direct pathway from Social Advantage independent of cannabis/tobacco use. As shown in Table S2, cannabis and tobacco use were significantly and strongly associated with the Social Advantage latent factor, and more modestly associated with the Psychosocial Distress latent factor. The total effect for the relationship of Social Advantage to residual birthweight (combination of both direct and indirect pathways) remained highly significant. Critically, the direct relationship of Social Advantage (i.e., independent of tobacco and cannabis use) to residual birthweight remained significant, while there was no direct relationship of cannabis or tobacco use to birthweight independent of Social Advantage. These data indicate that while cannabis and tobacco use are greater among those women experiencing greater social disadvantage and psychosocial distress, social advantage still predicts birthweight even accounting for this substance use.

Table S1. Frequency timing and source of clinical and demographic variables

Variable	Frequency of measurement	Timing if singular	Composite value	Source
Income to Needs	Each trimester	NA	No	Self-reported
Insurance status	Singular	At enrollment	No	Medical Record
Maternal education	Singular	At enrollment	NA	Self-reported
ADI	Twice	At enrollment and third trimester	NA	Medical Record at enrollment and verified via self-report at third trimester
Healthy Eating Index	Singular	At third trimester or delivery	NA	DHQII self-reported
EPDS	Each trimester	NA	No	Self-reported
PSS	Each trimester	NA	No	Self-reported
STRAIN	Singular	At neonatal scan	No	Self-reported
Discrimination	Singular	At neonatal scan	No	Self-reported
Maternal age	Singular	At delivery	NA	Medical Record
Pre-pregnancy BMI	Singular	At enrollment	NA	Self-reported from Medical Record
MMR*	Preexisting conditions and over course of pregnancy	Enrollment to delivery	Yes 24 factors	Medical Record
Birthweight	Singular	At delivery	NA	Medical Record
Gestational age	Singular	At delivery	NA	Medical Record

*Maternal co-morbidities included chronic congestive heart failure, congenital heart disease, pulmonary hypertension, chronic ischemic heart disease, cardiac valvular disease, pre-existing hypertension, gestational hypertension, chronic renal disease, preexisting diabetes mellitus, , asthma, severe pre-eclampsia, sickle cell disease, age ≥ 35 , systemic lupus erythematosus, HIV virus, mild or unspecified pre-eclampsia, placental previa.

Table S2: Full Structural Equation Model Predicting Gestational Age						
Variable	Raw Estimate	STDY Estimate	Standard Error	Estimate/Standard Error	p (2-tailed)	Residual Variance
Indicators of Social Disadvantage						
Income/Needs 1 st Trimester	-0.365	-0.909	0.019	-47.270	0.000	0.174
Income/Needs 2 nd Trimester	-0.372	-0.914	0.019	-48.003	0.000	0.164
Income/Needs 3 rd Trimester	-0.371	-0.915	0.017	-53.368	0.000	0.163
Area Deprivation Index	17.813	0.720	0.029	24.501	0.000	0.481
Health Insurance	-2.833	-0.842	0.029	-28.964	0.000	
Education	-2.767	-0.836	0.024	-34.797	0.000	
HEI-2016 Total Score	-3.772	-0.383	0.054	-7.154	0.000	0.853
Indicators of Psychosocial Distress						
EPDS 1 st Trimester	3.632	0.746	0.033	22.446	0.000	0.443
EPDS 2 nd Trimester	3.827	0.770	0.031	25.201	0.000	0.407
EPDS 3 rd Trimester	3.394	0.708	0.051	13.838	0.000	0.498
PSS 1 st Trimester	5.705	0.770	0.029	26.431	0.000	0.406
PSS 2 nd Trimester	6.328	0.812	0.030	27.031	0.000	0.340
PSS 3 rd Trimester	5.364	0.713	0.038	18.768	0.000	0.492
STRAIN - CT	2.604	0.431	0.051	8.480	0.000	0.814
STRAIN – WT SEV	9.308	0.470	0.051	9.188	0.000	0.779
Discrimination Survey	0.522	0.235	0.058	4.030	0.000	0.945
Predictors of Gestational Age						0.835
Social Disadvantage	-0.429	-0.216	0.072	-2.997	0.003	
Psychosocial Distress	-0.070	-0.035	0.057	-0.623	0.533	
Maternal Medical Risk Score	-0.348	-0.295	0.073	-4.043	0.000	
Maternal Age at Delivery	-0.013	-0.035	0.066	-0.529	0.597	
Pre-Pregnancy BMI	-0.009	-0.037	0.059	-0.633	0.527	
Cervix Length	0.037	0.141	0.071	1.978	0.048	
Covariances						
Computed from confirmatory factor analysis						
Social Disadvantage w Psychosocial Distress		0.353	0.045	7.841	0.000	
Inserted because of residual correlations						
Income/Needs 1 st Trimester w 2 nd Trimester		0.727	0.063	11.518	0.000	
Income/Needs 1 st Trimester w 3 rd Trimester		0.668	0.068	9.845	0.000	

Income/Needs 2 nd Trimester w 3 rd Trimester	0.752	0.054	14.040	0.000	
STRAIN – STRAIN-CT w STRAIN-WTSEV	0.917	0.011	87.001	0.000	
Covariances among predictors					
Maternal Medical Risk w Social Disadvantage	-0.008	0.050	-0.167	0.867	
Maternal Medical Risk w Psychosocial Distress	0.012	0.052	0.221	0.825	
Maternal Medical Risk w Maternal Age at Delivery	0.278	0.047	5.860	0.000	
Maternal Medical Risk w Pre-Pregnancy BMI	0.237	0.059	4.024	0.000	
Maternal Medical Risk w Cervix Length	0.008	0.045	0.173	0.863	
Maternal Age at Delivery w Social Disadvantage	-0.430	0.046	-9.348	0.000	
Maternal Age at Delivery w Psychosocial Distress	-0.195	0.054	-3.627	0.000	
Maternal Age at Delivery w Pre-Pregnancy BMI	0.089	0.060	1.472	0.141	
Maternal Age at Delivery w Cervix Length	0.066	0.058	1.142	0.253	
Pre-Pregnancy BMI w Social Disadvantage	0.152	0.058	2.628	0.009	
Pre-Pregnancy BMI w Psychosocial Distress	0.081	0.062	1.302	0.193	
Pre-Pregnancy BMI w Cervix Length	0.037	0.082	0.454	0.650	
Cervix Length w Social Disadvantage	0.042	0.058	0.719	0.472	
Cervix Length w Psychosocial Distress	-0.022	0.057	-0.394	0.693	

Table S3: Full Structural Equation Model Predicting Birthweight Adjusted for Gestational Age						
Variable	Raw Estimate	STDY Estimate	Standard Error	Estimate/Standard Error	p (2-tailed)	Residual Variance
Indicators of Social Disadvantage						
Income/Needs 1 st Trimester	-0.363	-0.903	0.019	-47.853	0.000	0.184
Income/Needs 2 nd Trimester	-0.370	-0.909	0.019	-48.292	0.000	0.174
Income/Needs 3 rd Trimester	-0.368	-0.909	0.017	-53.270	0.000	0.174
Area Deprivation Index	17.846	0.722	0.029	24.542	0.000	0.479
Health Insurance	-2.873	-0.846	0.029	-29.372	0.000	
Education	-2.828	-0.842	0.023	-36.011	0.000	
HEI-2016 Total Score	-3.756	-0.381	0.054	-7.125	0.000	0.854
Indicators of Psychosocial Distress						
EPDS 1 st Trimester	3.631	0.746	0.033	22.475	0.000	0.443
EPDS 2 nd Trimester	3.830	0.770	0.030	25.316	0.000	0.407
EPDS 3 rd Trimester	3.394	0.708	0.051	13.844	0.000	0.498
PSS 1 st Trimester	5.701	0.770	0.029	26.430	0.000	0.407
PSS 2 nd Trimester	6.324	0.812	0.030	27.040	0.000	0.341
PSS 3 rd Trimester	5.360	0.712	0.038	18.738	0.000	0.493
STRAIN - CT	2.608	0.432	0.051	8.501	0.000	0.814
STRAIN – WT SEV	9.314	0.471	0.051	9.185	0.000	0.778
Discrimination Survey	0.524	0.236	0.058	4.034	0.000	0.944
Predictors of Birthweight						0.940
Social Disadvantage	-0.012	-0.201	0.073	-2.770	0.006	
Psychosocial Distress	-0.001	-0.021	0.055	-0.375	0.708	
Maternal Medical Risk Score	0.000	-0.013	0.053	-0.241	0.810	
Maternal Age at Delivery	0.000	0.022	0.060	0.364	0.716	
Pre-Pregnancy BMI	0.001	0.143	0.061	2.352	0.019	
HEI-2016 Total Score	0.000	0.005	0.058	0.088	0.930	
Covariances						
Computed from confirmatory factor analysis						
Social Disadvantage w Psychosocial Distress		0.354	0.045	7.839	0.000	
Inserted because of residual correlations						
Income/Needs 1 st Trimester w 2 nd Trimester		0.742	0.057	13.106	0.000	
Income/Needs 1 st Trimester w 3 rd Trimester		0.687	0.060	11.393	0.000	
Income/Needs 2 nd Trimester w 3 rd Trimester		0.767	0.048	16.068	0.000	

STRAIN – STRAIN-CT w STRAIN-WTSEV	0.917	0.011	86.926	0.000	
Covariances among predictors					
Maternal Medical Risk w Social Disadvantage	-0.009	0.050	-0.182	0.856	
Maternal Medical Risk w Psychosocial Distress	0.011	0.052	0.220	0.826	
Maternal Age at Delivery w Social Disadvantage	-0.434	0.046	-9.464	0.000	
Maternal Age at Delivery w Psychosocial Distress	-0.195	0.054	-3.624	0.000	
Pre-Pregnancy BMI w Social Disadvantage	0.153	0.058	2.626	0.009	
Pre-Pregnancy BMI w Psychosocial Distress	0.085	0.062	1.381	0.170	
Pre-Pregnancy BMI w Maternal Medical Risk	0.236	0.059	4.016	0.000	
Pre-Pregnancy BMI w Maternal Age at Delivery	0.090	0.060	1.505	0.132	
Maternal Age at Delivery w Maternal Medical Risk	0.278	0.047	5.860	0.000	

Table S4: SEM Model Predicting Gestational Age Incorporating Cannabis and Tobacco Use

Variable	Raw Estimate	STDY Estimate	Standard Error	Estimate/Standard Error	p (2-tailed)	Residual Variance
Indicators of Social Disadvantage						
Income/Needs 1 st Trimester	-0.364	-0.906	0.019	-48.823	0.000	0.178
Income/Needs 2 nd Trimester	-0.372	-0.914	0.018	-49.769	0.000	0.165
Income/Needs 3 rd Trimester	-0.370	-0.914	0.016	-55.449	0.000	0.165
Area Deprivation Index	17.732	0.717	0.029	24.606	0.000	0.486
Health Insurance	-2.869	-0.845	0.029	-29.229	0.000	
Education	-2.792	-0.839	0.024	-35.454	0.000	
HEI-2016 Total Score	-3.804	-0.386	0.053	-7.226	0.000	0.851
Indicators of Psychosocial Distress						
EPDS 1 st Trimester	3.641	0.748	0.033	22.802	0.000	0.440
EPDS 2 nd Trimester	3.830	0.771	0.030	25.319	0.000	0.406
EPDS 3 rd Trimester	3.384	0.706	0.051	13.762	0.000	0.502
PSS 1 st Trimester	5.717	0.772	0.029	26.430	0.000	0.404
PSS 2 nd Trimester	6.334	0.812	0.030	27.125	0.000	0.340
PSS 3 rd Trimester	5.351	0.710	0.038	18.496	0.000	0.495
STRAIN - CT	2.616	0.433	0.051	8.532	0.000	0.813
STRAIN – WT SEV	9.338	0.472	0.051	9.243	0.000	0.777
Discrimination Survey	0.522	0.235	0.058	4.013	0.000	0.945
Predictors of Gestational Age						0.825
Social Disadvantage	-0.516	-0.260	0.077	-3.380	0.001	
Psychosocial Distress	-0.100	-0.050	0.055	-0.912	0.362	
Maternal Medical Risk Score	-0.352	-0.299	0.073	-4.115	0.000	
Maternal Age at Delivery	-0.023	-0.063	0.068	-0.924	0.356	
Pre-Pregnancy BMI	-0.006	-0.025	0.059	-0.415	0.678	
Cervix Length	0.038	0.146	0.067	2.180	0.029	
Cannabis	0.065	0.018	0.056	0.320	0.749	
Tobacco	0.411	0.104	0.042	2.445	0.014	
Covariances						
Computed from confirmatory factor analysis						
Social Disadvantage w Psychosocial Distress		0.354	0.045	7.853	0.000	
Inserted because of residual correlations						
Income/Needs 1 st Trimester w 2 nd Trimester		0.731	0.060	12.254	0.000	

Income/Needs 1 st Trimester w 3 rd Trimester	0.674	0.063	10.611	0.000	
Income/Needs 2 nd Trimester w 3 rd Trimester	0.755	0.051	14.664	0.000	
STRAIN – STRAIN-CT w STRAIN-WTSEV	0.916	0.011	86.993	0.000	
Covariances among predictors					
Maternal Medical Risk w Social Disadvantage	-0.009	0.050	-0.172	0.863	
Maternal Medical Risk w Psychosocial Distress	0.011	0.052	0.207	0.836	
Maternal Medical Risk w Maternal Age at Delivery	0.278	0.047	5.860	0.000	
Maternal Medical Risk w Pre-Pregnancy BMI	0.236	0.059	4.025	0.000	
Maternal Medical Risk w Cannabis	0.066	0.055	1.204	0.228	
Maternal Medical Risk w Tobacco	0.066	0.054	1.226	0.220	
Maternal Medical Risk w Cervix Length	0.008	0.045	0.186	0.853	
Maternal Age at Delivery w Social Disadvantage	-0.431	0.046	-9.443	0.000	
Maternal Age at Delivery w Psychosocial Distress	-0.195	0.054	-3.628	0.000	
Maternal Age at Delivery w Pre-Pregnancy BMI	0.091	0.060	1.512	0.131	
Maternal Age at Delivery w Cannabis	-0.082	0.048	-1.716	0.086	
Maternal Age at Delivery w Tobacco	0.068	0.049	1.396	0.163	
Maternal Age at Delivery w Cervix Length	0.063	0.057	1.093	0.274	
Pre-Pregnancy BMI w Social Disadvantage	0.150	0.058	2.598	0.009	
Pre-Pregnancy BMI w Psychosocial Distress	0.078	0.062	1.266	0.205	
Pre-Pregnancy BMI w Cannabis	-0.003	0.057	-0.058	0.953	
Pre-Pregnancy BMI w Tobacco	-0.012	0.057	-0.211	0.833	
Pre-Pregnancy BMI w Cervix Length	0.027	0.083	0.331	0.741	
Cannabis w Social Disadvantage	0.279	0.026	10.668	0.000	
Cannabis w Psychosocial Distress	0.225	0.054	4.159	0.000	
Cannabis w Tobacco	0.319	0.073	4.364	0.000	
Cannabis w Cervix Length	-0.108	0.061	-1.785	0.074	
Tobacco w Social Disadvantage	0.289	0.031	9.467	0.000	
Tobacco w Psychosocial Distress	0.202	0.056	3.623	0.000	
Tobacco w Cervix Length	0.001	0.069	0.019	0.985	
Cervix Length w Social Disadvantage	0.045	0.058	0.781	0.435	
Cervix Length w Psychosocial Distress	-0.023	0.057	-0.396	0.692	

Table S5: SEM Model Predicting Birthweight Controlling for Gestational Age Incorporating Cannabis and Tobacco Use

Variable	Raw Estimate	STDY Estimate	Standard Error	Estimate/Standard Error	p (2-tailed)	Residual Variance
Indicators of Social Disadvantage						
Income/Needs 1 st Trimester	-0.364	-0.904	0.019	-48.086	0.000	0.182
Income/Needs 2 nd Trimester	-0.371	-0.913	0.019	-48.862	0.000	0.167
Income/Needs 3 rd Trimester	-0.370	-0.912	0.017	-54.228	0.000	0.168
Area Deprivation Index	17.727	0.717	0.029	24.416	0.000	0.486
Health Insurance	-2.901	-0.848	0.029	-29.681	0.000	
Education	-2.834	-0.842	0.023	-35.879	0.000	
HEI-2016 Total Score	-3.766	-0.382	0.054	-7.140	0.000	0.854
Indicators of Psychosocial Distress						
EPDS 1 st Trimester	3.642	0.749	0.033	22.899	0.000	0.440
EPDS 2 nd Trimester	3.832	0.771	0.030	25.474	0.000	0.406
EPDS 3 rd Trimester	3.384	0.706	0.051	13.795	0.000	0.502
PSS 1 st Trimester	5.717	0.772	0.029	26.443	0.000	0.404
PSS 2 nd Trimester	6.330	0.812	0.030	27.149	0.000	0.341
PSS 3 rd Trimester	5.344	0.709	0.039	18.406	0.000	0.497
STRAIN - CT	2.626	0.435	0.051	8.554	0.000	0.811
STRAIN – WT SEV	9.363	0.473	0.051	9.244	0.000	0.776
Discrimination Survey	0.523	0.235	0.059	4.016	0.000	0.945
Predictors of Birthweight						0.925
Social Disadvantage	-0.008	-0.138	0.070	-1.983	0.047	
Psychosocial Distress	0.001	0.008	0.055	0.154	0.878	
Maternal Medical Risk Score	0.000	-0.003	0.050	-0.069	0.945	
Maternal Age at Delivery	0.001	0.061	0.063	0.979	0.328	
Pre-Pregnancy BMI	0.001	0.125	0.060	2.083	0.037	
Cannabis	-0.010	-0.088	0.052	-1.679	0.093	
Tobacco	-0.013	-0.105	0.061	-1.729	0.084	
Covariances						
Computed from confirmatory factor analysis						
Social Disadvantage w Psychosocial Distress		0.354	0.045	7.851	0.000	
Inserted because of residual correlations						
Income/Needs 1 st Trimester w 2 nd Trimester		0.736	0.059	12.573	0.000	

Income/Needs 1 st Trimester w 3 rd Trimester	0.680	0.062	11.025	0.000	
Income/Needs 2 nd Trimester w 3 rd Trimester	0.759	0.050	15.156	0.000	
STRAIN – STRAIN-CT w STRAIN-WTSEV	0.916	0.011	86.879	0.000	
Covariances among predictors					
Maternal Medical Risk w Social Disadvantage	-0.025	0.059	-0.418	0.676	
Maternal Medical Risk w Psychosocial Distress	0.021	0.061	0.340	0.734	
Maternal Age at Delivery w Social Disadvantage	-0.409	0.050	-8.205	0.000	
Maternal Age at Delivery w Psychosocial Distress	-0.044	0.056	-0.795	0.427	
Pre-Pregnancy BMI w Social Disadvantage	0.131	0.068	1.921	0.055	
Pre-Pregnancy BMI w Psychosocial Distress	0.023	0.072	0.315	0.753	
Cannabis w Social Disadvantage	0.230	0.033	6.925	0.000	
Cannabis w Psychosocial Distress	0.148	0.060	2.457	0.014	
Tobacco w Social Disadvantage	0.241	0.037	6.497	0.000	
Tobacco w Psychosocial Distress	0.121	0.062	1.944	0.052	