

ALIF EXPLORATION

Selected Variables

base: Code of the patient
covariates:
- Age
- Gender
- Prior Spine Surgery
- '1st surgeon: experience in ASD surgery'
- ASA classification
- Decompression
- Osteotomy
- 3CO
- SPOs
- BMI_First Visit
- Tobacco use_First Visit
- Osteoporosis / osteopenia
- Previous surgery - LEV
- LGap
- RLL
- Cobb LS curve (Degree)
- Number of Interbody Fusions
- 'Posterior Instrumented Fusion: Upper / Lower Levels'
- Alif
- LL-Lordosis Difference
outcomes ql:
- 2Y. ODI - Score (%)
- 2Y. SRS22 - SRS Subtotal score
- 2Y. SF36 - MCS
- 2Y. SF36 - PCS
outcomes radiology:
- 6W. Major curve Cobb angle
- 1Y. Major curve Cobb angle
- 2Y. Major curve Cobb angle
- 6W. T1 Sagittal Tilt
- 1Y. T1 Sagittal Tilt
- 2Y. T1 Sagittal Tilt
- 6W. Sagittal Balance
- 1Y. Sagittal Balance
- 2Y. Sagittal Balance
- 6W. Global Tilt
- 1Y. Global Tilt
- 2Y. Global Tilt
- 6W. Lordosis (top of L1-S1)
- 1Y. Lordosis (top of L1-S1)
- 2Y. Lordosis (top of L1-S1)
- 6W. LGap

- 1Y. LGap
- 2Y. LGap
- 6W. Pelvic Tilt
- 1Y. Pelvic Tilt
- 2Y. Pelvic Tilt

predictive:

- Weight (kgs)_First Visit
- Height (cm)_First Visit
- Total surgical time st1+st2+st3
- Osteotomy
- Alcohol/drug abuse
- Anemia or other blood disorders
- Osteoarthritis
- Mild vascular
- Depression / anxiety
- Diabetes with end organ damage
- Cardiac
- Hypertension
- Chronic pulmonary disease
- Nervous system disorders
- Renal
- Peripheral vascular disease
- Psychiatric / Behavioral
- Peptic ulcer
- Bladder incontinence
- Bowel incontinence
- Leg weakness
- Loss of balance
- NRS back - Leg pain - Average
- Tobacco use_First Visit
- Years with spine problems
- ODI - Score (%)_First Visit
- SRS22 - SRS Total score_First Visit
- SF36 - PCS_First Visit
- SF36 - MCS_First Visit
- Major curve Cobb angle

demographic:

- Age
- Gender
- Prior Spine Surgery
- ASA classification
- 3CO
- BMI_First Visit
- Global Tilt
- ideal LL
- Lordosis (top of L1-S1)
- ODI - Score (%)_First Visit
- SRS22 - SRS Total score_First Visit
- SF36 - PCS_First Visit
- SF36 - MCS_First Visit
- Major curve Cobb angle

expanded:

- Age
- Gender

- Prior Spine Surgery
- '1st surgeon: experience in ASD surgery'
- ASA classification
- Decompression
- Osteotomy
- 3CO
- SPOs
- BMI_First Visit
- Tobacco use_First Visit
- Osteoporosis / osteopenia
- Previous surgery - LEV
- LGap
- RLL
- Cobb LS curve (Degree)
- Number of Interbody Fusions
- 'Posterior Instrumented Fusion: Upper / Lower Levels'
- Alif
- LL-Lordosis Difference
- Weight (kgs)_First Visit
- Height (cm)_First Visit
- Total surgical time st1+st2+st3
- Alcohol/drug abuse
- Anemia or other blood disorders
- Osteoarthritis
- Mild vascular
- Depression / anxiety
- Diabetes with end organ damage
- Cardiac
- Hypertension
- Chronic pulmonary disease
- Nervous system disorders
- Renal
- Peripheral vascular disease
- Psychiatric / Behavioral
- Peptic ulcer
- Bladder incontinence
- Bowel incontinence
- Leg weakness
- Loss of balance
- NRS back - Leg pain - Average
- Years with spine problems
- ODI - Score (%)_First Visit
- SRS22 - SRS Total score_First Visit
- SF36 - PCS_First Visit
- SF36 - MCS_First Visit
- Major curve Cobb angle
- SRS22 - SRS Subtotal score_First Visit
- T1 Sagittal Tilt
- Sagittal Balance
- Global Tilt
- Lordosis (top of L1-S1)
- Pelvic Tilt

Propensity Scores Common Support

Model Stats

- Treatment proportion: 0.127
- Model Type: elastic_net
- Accuracy: 0.8938185
- Params: alpha: 0.1230769 lambda: 0.0142449

Average Treatment Effects - Radiology

Outcome: 6W. Major curve Cobb angle

Distribution:

0%	25%	50%	75%	100%
-65.000	-21.000	-10.440	-3.415	16.880

Model Type Y: boosting

RMSE: 17.5504326102863

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.8

min_child_weight: 1.0

subsample: 0.5

Model Type No: boosting

RMSE: 13.1991384265576

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

ATE (Yes-No): -5.922 (Std.Error: 4.148)

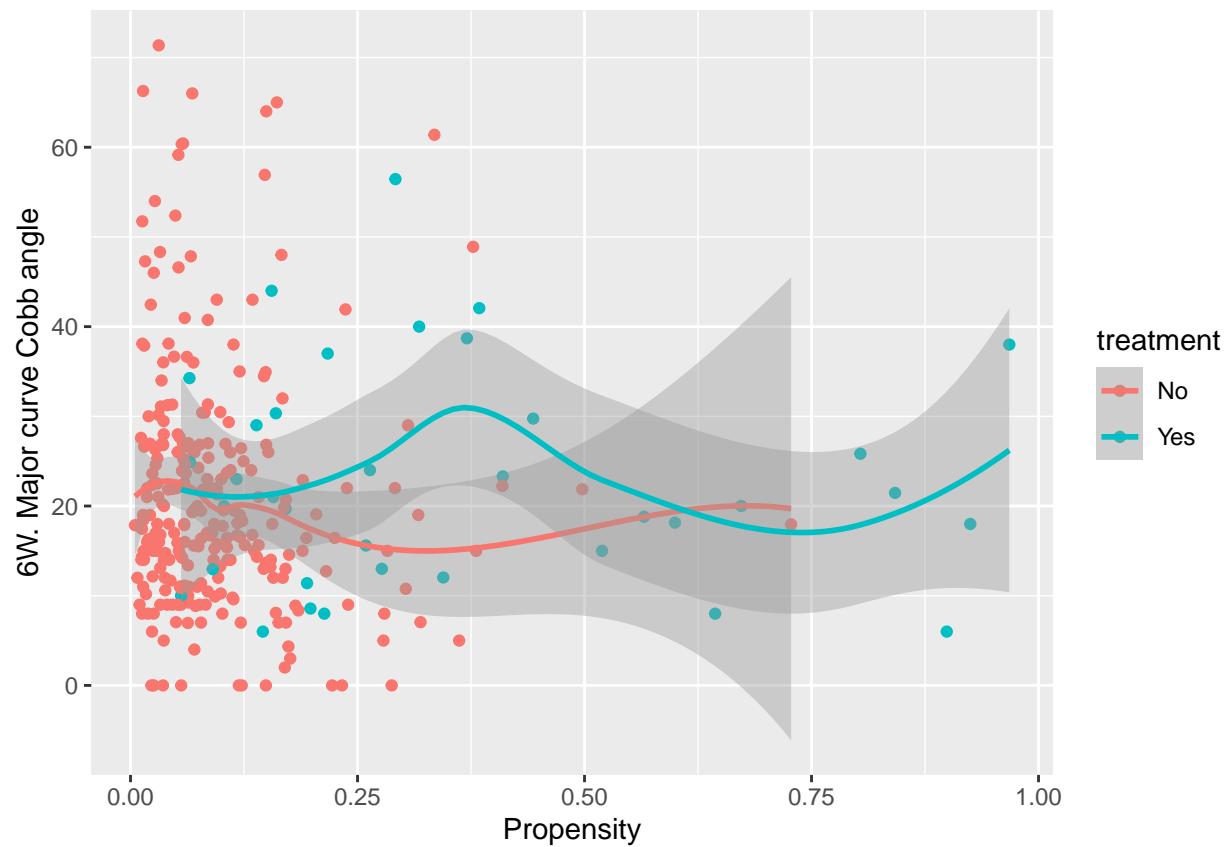
Trimmed ATE (Yes-No): -5.781 (Std.Error: 4.286)

Upper ATE (Yes-No): -9.682 (Std.Error: 4.361)

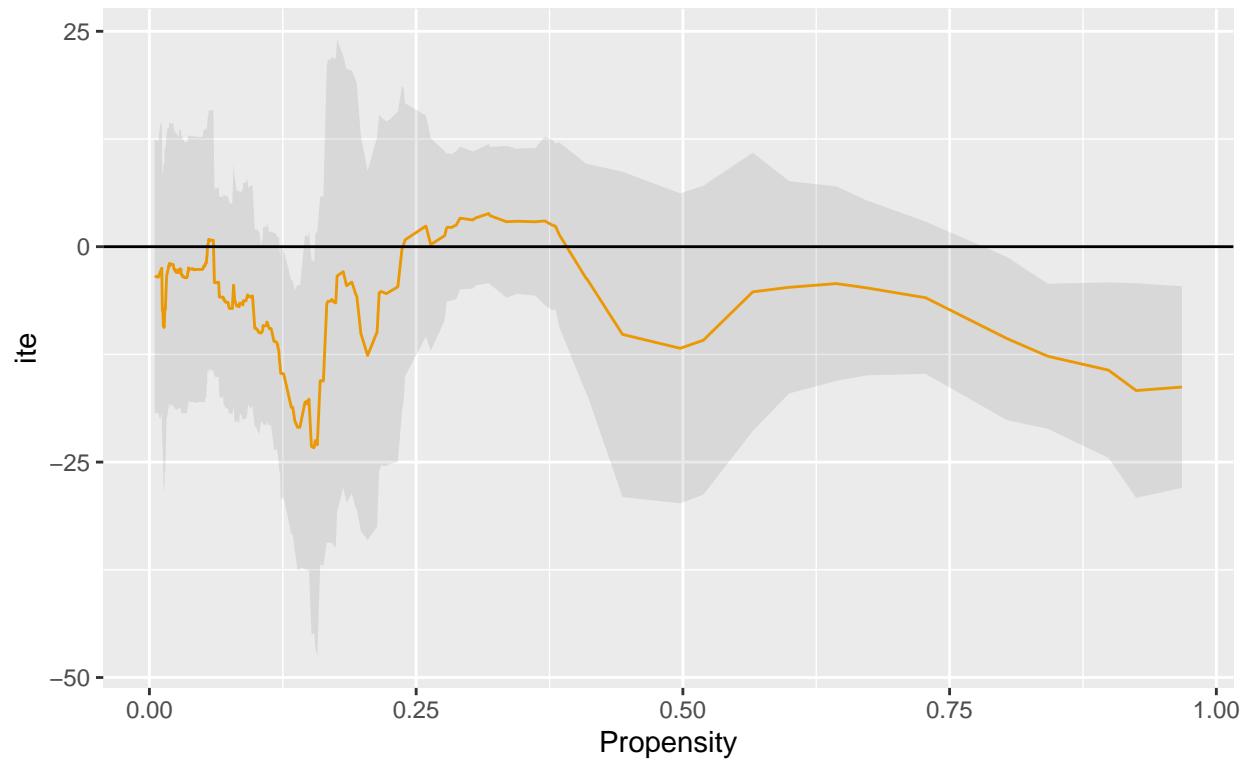
Observational differences in treatment 1.867 (Yes-No)

	treatment	outcome
1:	Yes	22.89611
2:	No	21.02903

'geom_smooth()' using method = 'loess' and formula 'y ~ x'

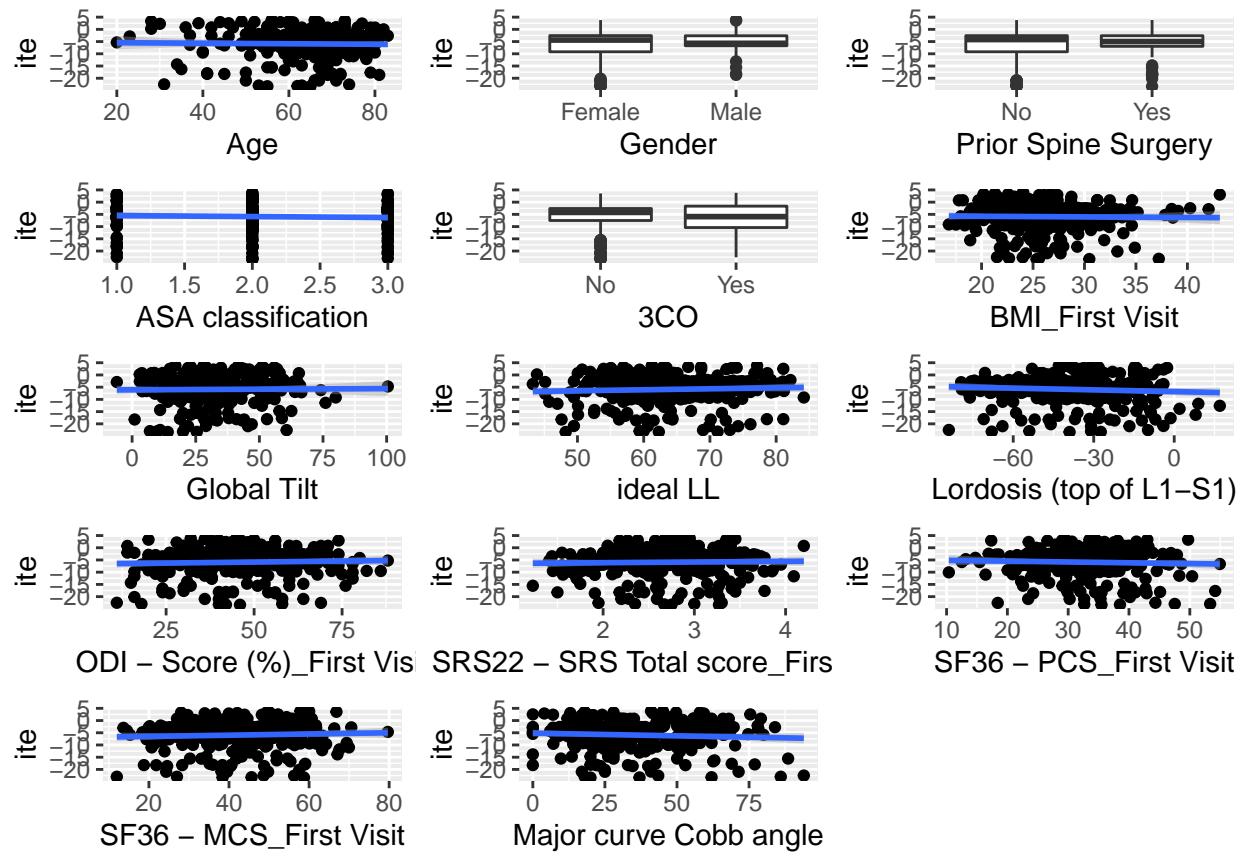


Individual Treatment effect by propensity
6W. Major curve Cobb angle



```
'geom_smooth()' using formula 'y ~ x'
```

```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 1Y. Major curve Cobb angle

Distribution:

0%	25%	50%	75%	100%
-64.00	-22.97	-9.93	-2.28	22.44

Model Type Y: boosting

RMSE: 18.2260769386965

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.8

min_child_weight: 1.0

subsample: 0.875

Model Type No: boosting

RMSE: 14.6755563642513

Params: nrounds: 50.0

max_depth: 1

eta: 0.4

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 0.875

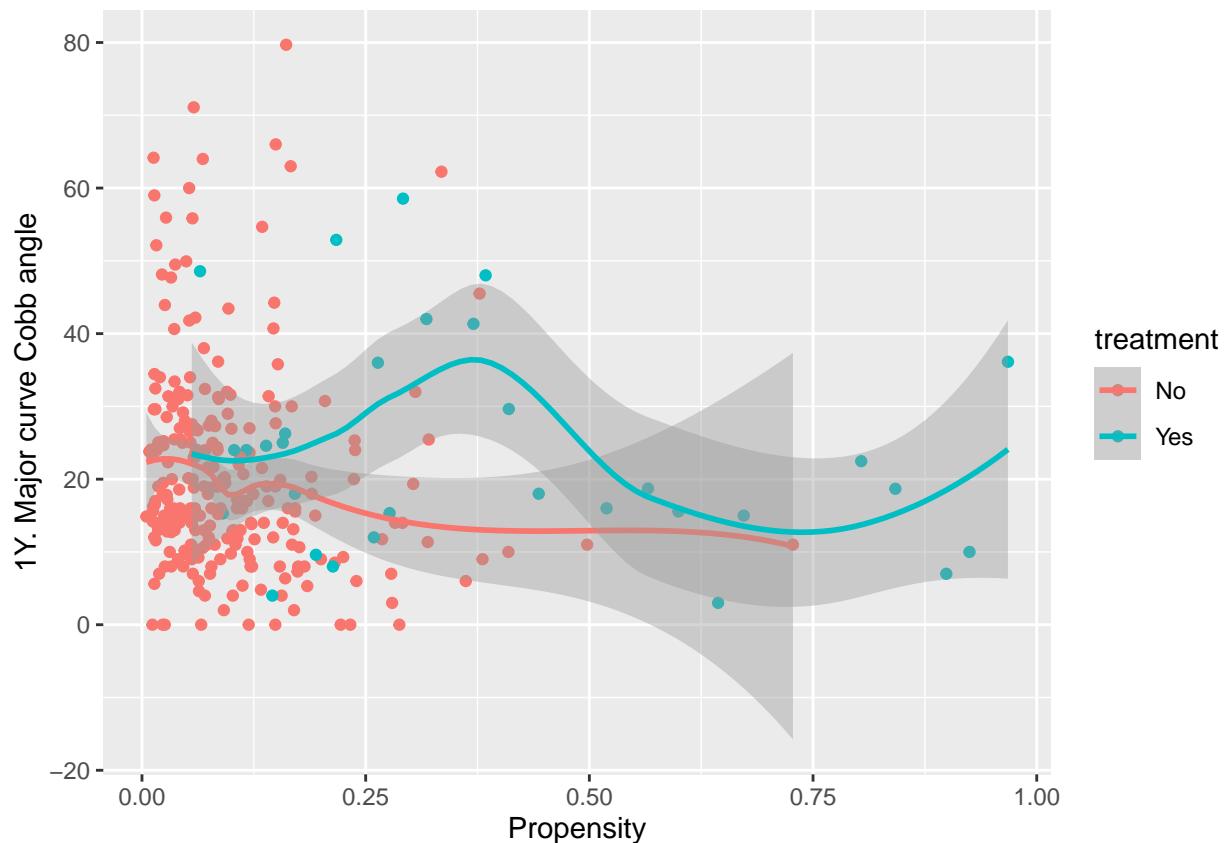
ATE (Yes-No): 0.841 (Std.Error: 3.554)

Trimmed ATE (Yes-No): 1.145 (Std.Error: 3.679)

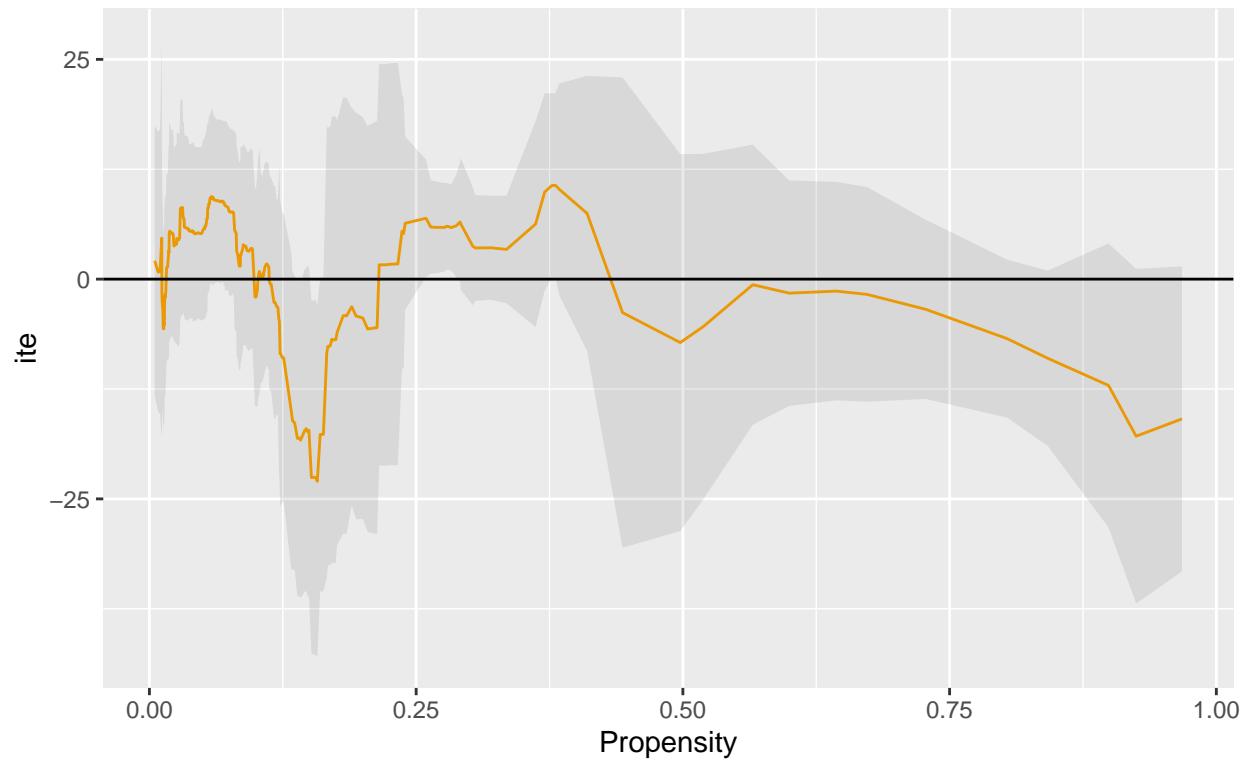
Upper ATE (Yes-No): -6.89 (Std.Error: 4.976)
Observational differences in treatment 3.198 (Yes-No)

```
treatment outcome  
1: Yes 23.67687  
2: No 20.47880
```

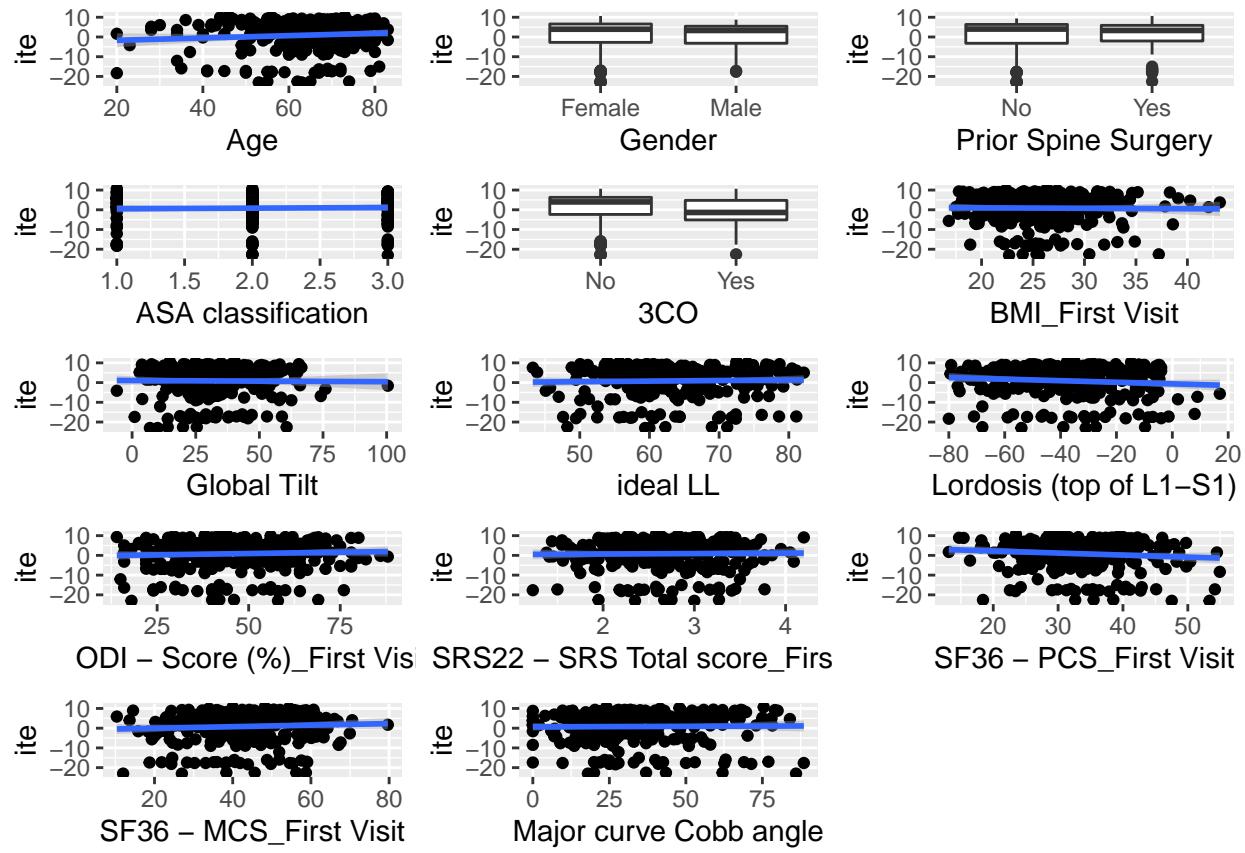
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity
1Y. Major curve Cobb angle



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 2Y. Major curve Cobb angle

Distribution:

0%	25%	50%	75%	100%
-60.00	-23.52	-9.53	-1.08	21.99

Model Type Y: boosting

RMSE: 22.6967741679397

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.8

min_child_weight: 1.0

subsample: 0.625

Model Type No: boosting

RMSE: 14.5302142079217

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.8

min_child_weight: 1.0

subsample: 0.5

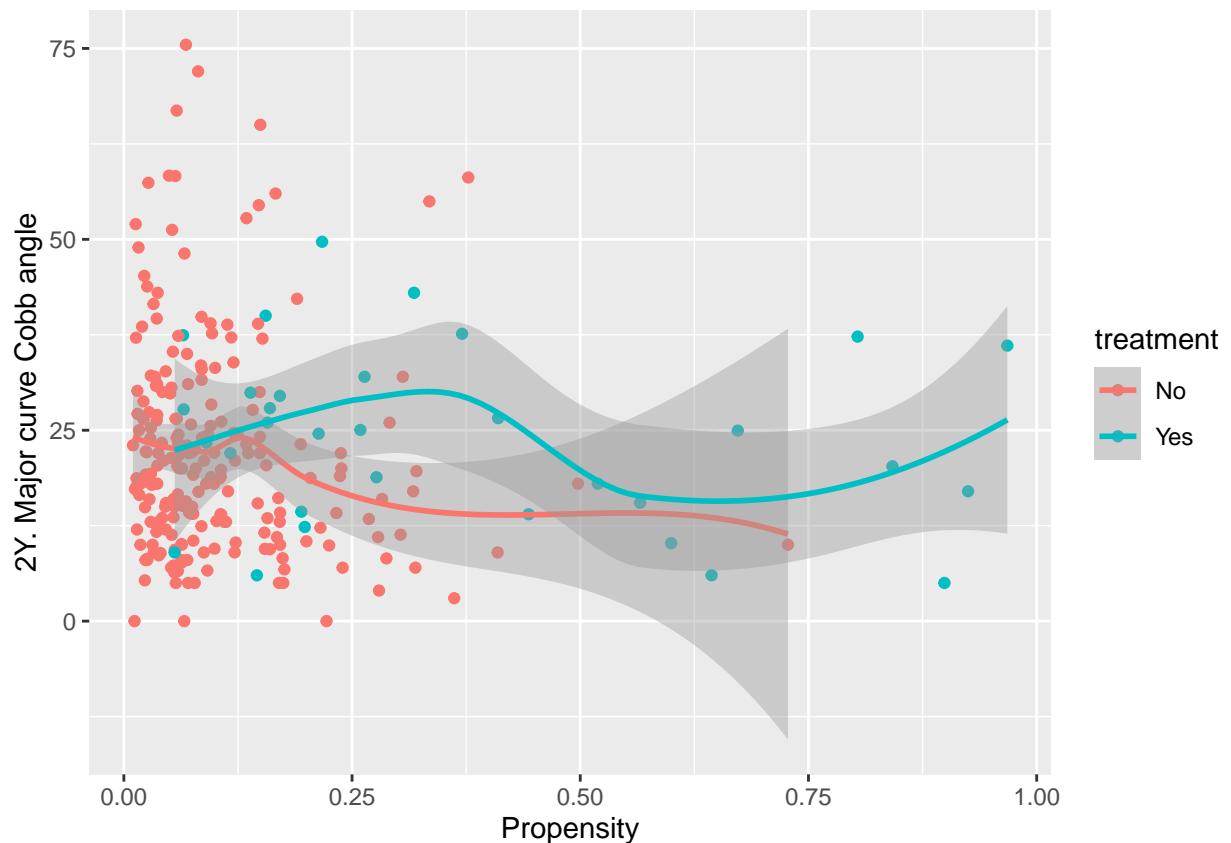
ATE (Yes-No): -3.428 (Std.Error: 3.967)

Trimmed ATE (Yes-No): -3.3 (Std.Error: 4.186)

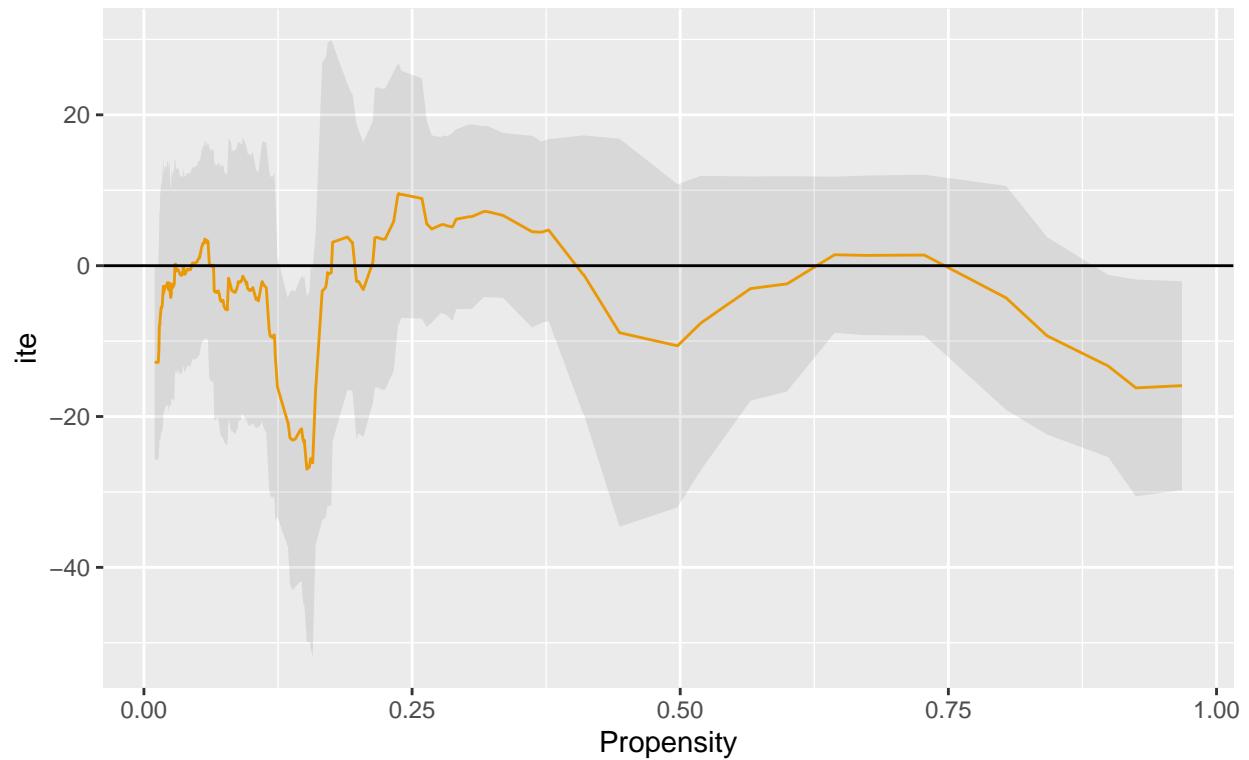
Upper ATE (Yes-No): -6.163 (Std.Error: 4.912)
Observational differences in treatment 1.849 (Yes-No)

```
treatment outcome  
1: Yes 23.97219  
2: No 22.12335
```

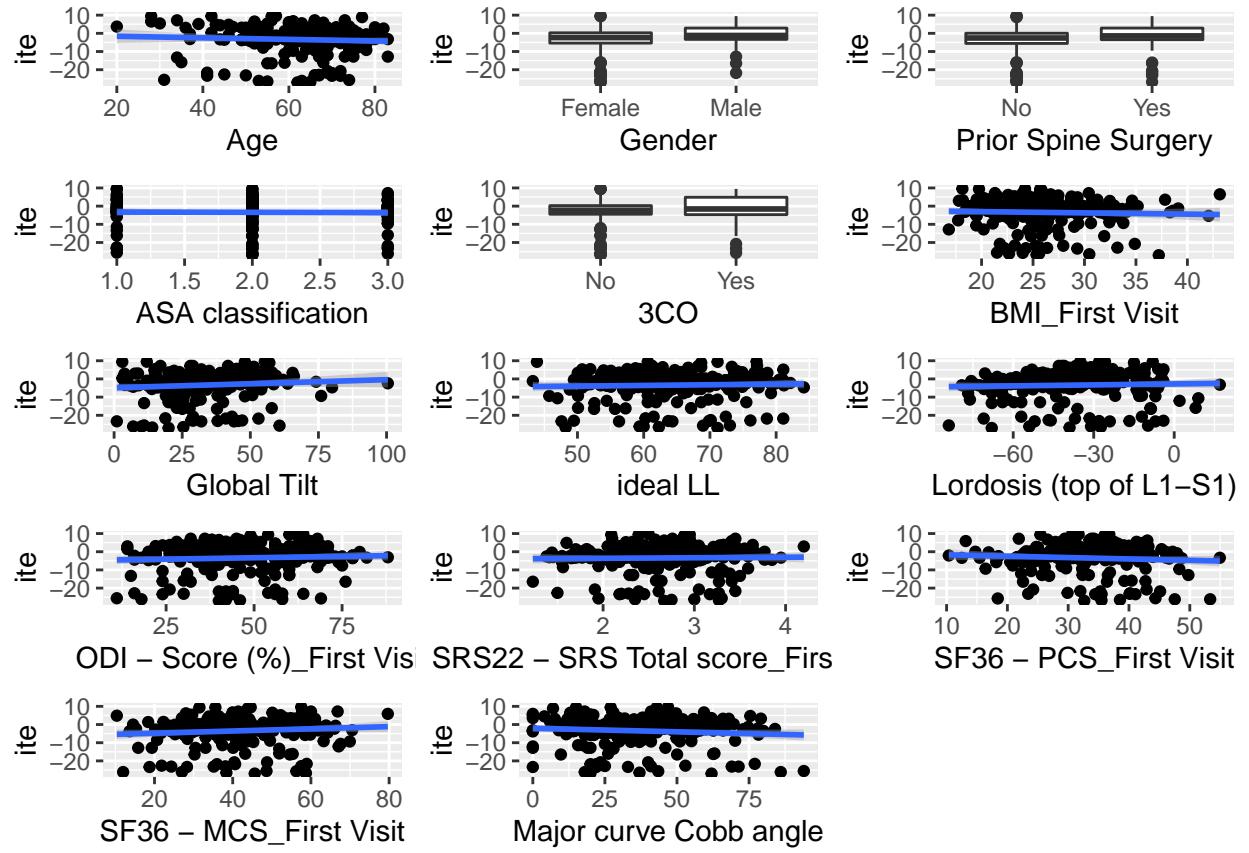
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity
2Y. Major curve Cobb angle



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 6W. T1 Sagittal Tilt

Distribution:

0%	25%	50%	75%	100%
-23.631420	-5.244884	-1.457698	2.000000	18.000000

Model Type Y: boosting

RMSE: 6.70235449134781

Params: nrounds: 100.0

max_depth: 3

eta: 0.4

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 0.625

Model Type No: boosting

RMSE: 5.70769551021777

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

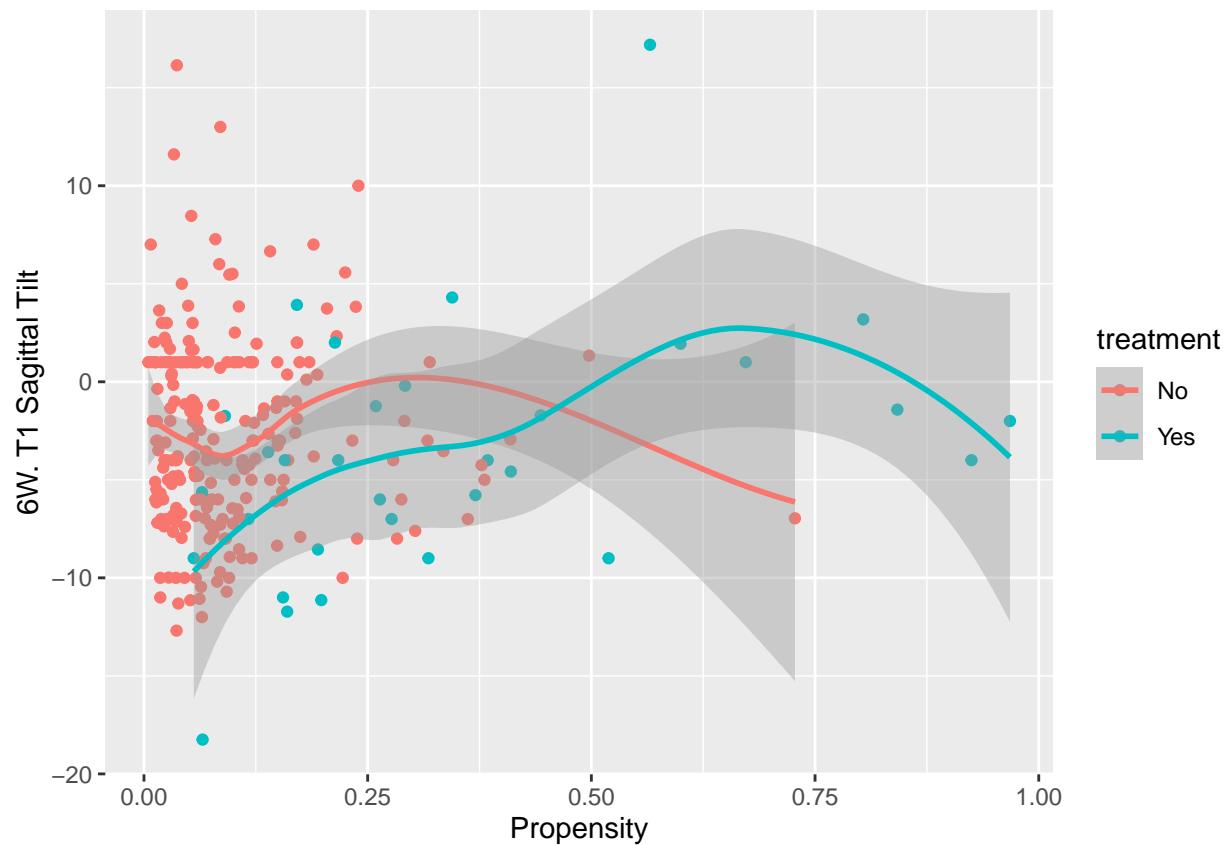
ATE (Yes-No): -6.68 (Std.Error: 1.703)

Trimmed ATE (Yes-No): -6.769 (Std.Error: 1.775)

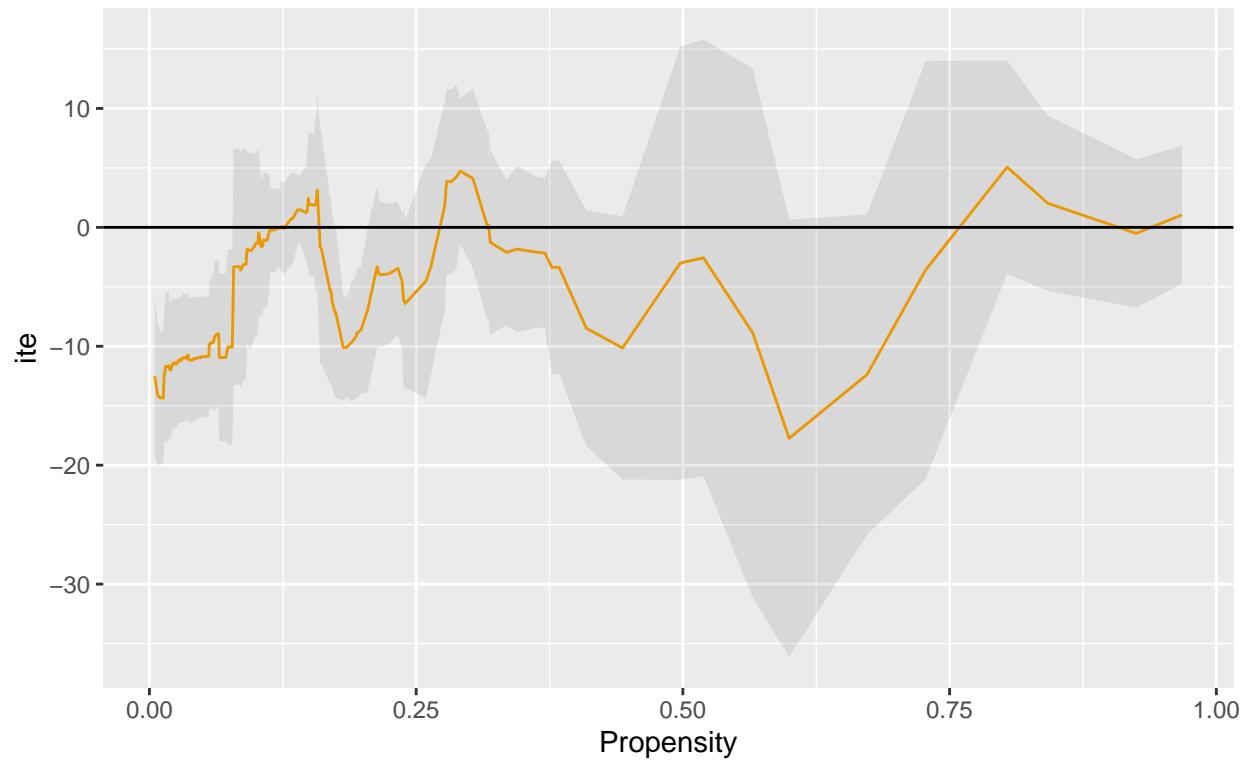
Upper ATE (Yes-No): -4.167 (Std.Error: 3.858)
Observational differences in treatment -0.932 (Yes-No)

```
treatment      outcome  
1:           Yes -3.688515  
2:          No -2.756435
```

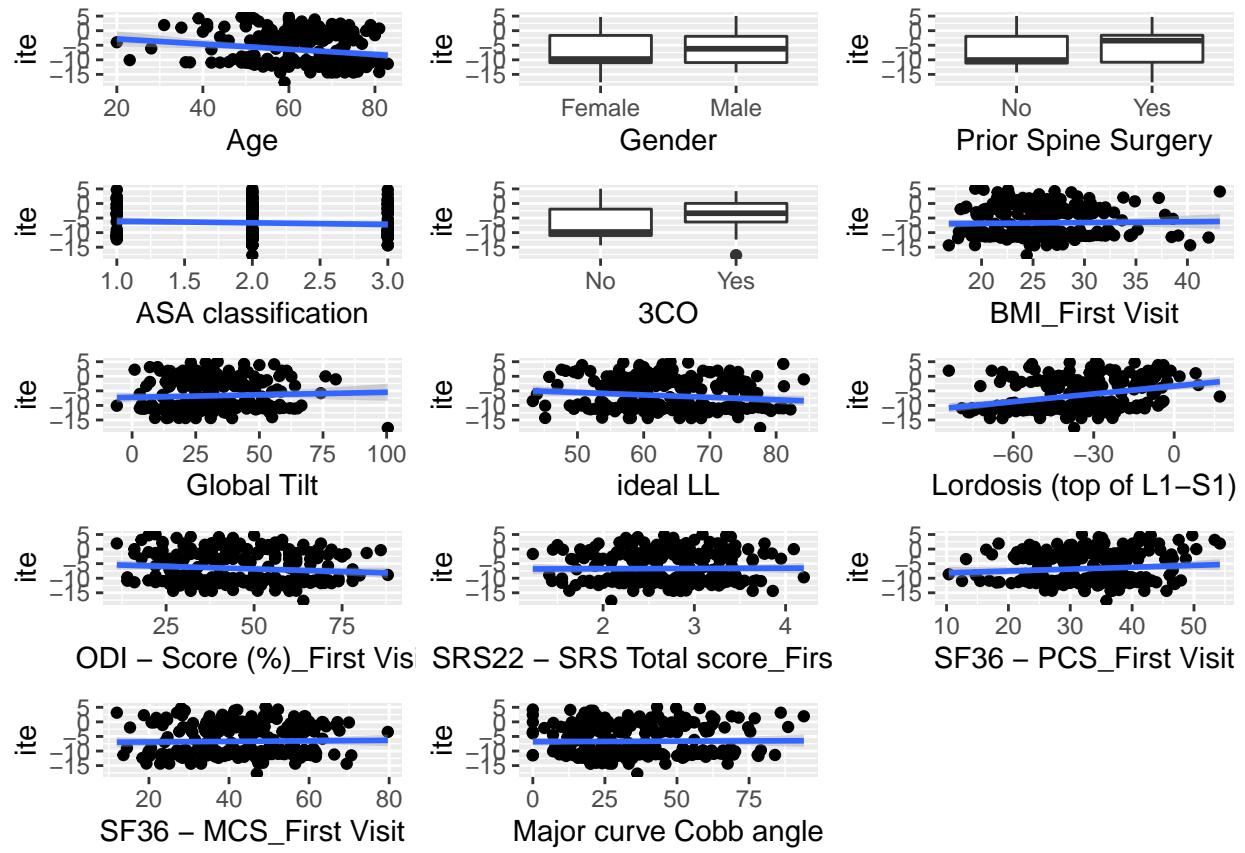
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity 6W. T1 Sagittal Tilt



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 1Y. T1 Sagittal Tilt

Distribution:

0%	25%	50%	75%	100%
-30.098675	-5.534988	-2.000000	1.480410	20.000000

Model Type Y: boosting

RMSE: 6.15389195969267

Params: nrounds: 50.0

max_depth: 2

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 0.5

Model Type No: boosting

RMSE: 5.83458019232961

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.8

min_child_weight: 1.0

subsample: 0.5

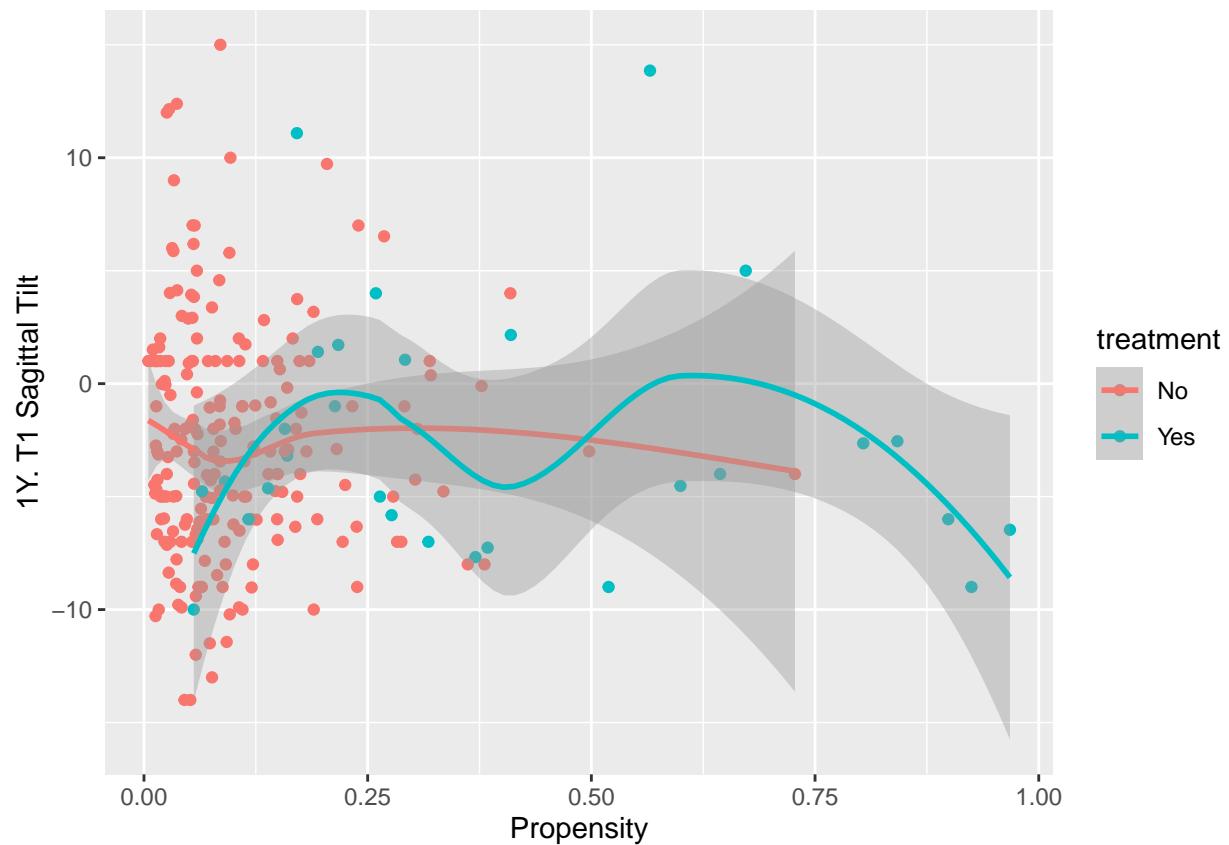
ATE (Yes-No): -4.93 (Std.Error: 1.737)

Trimmed ATE (Yes-No): -4.926 (Std.Error: 1.839)

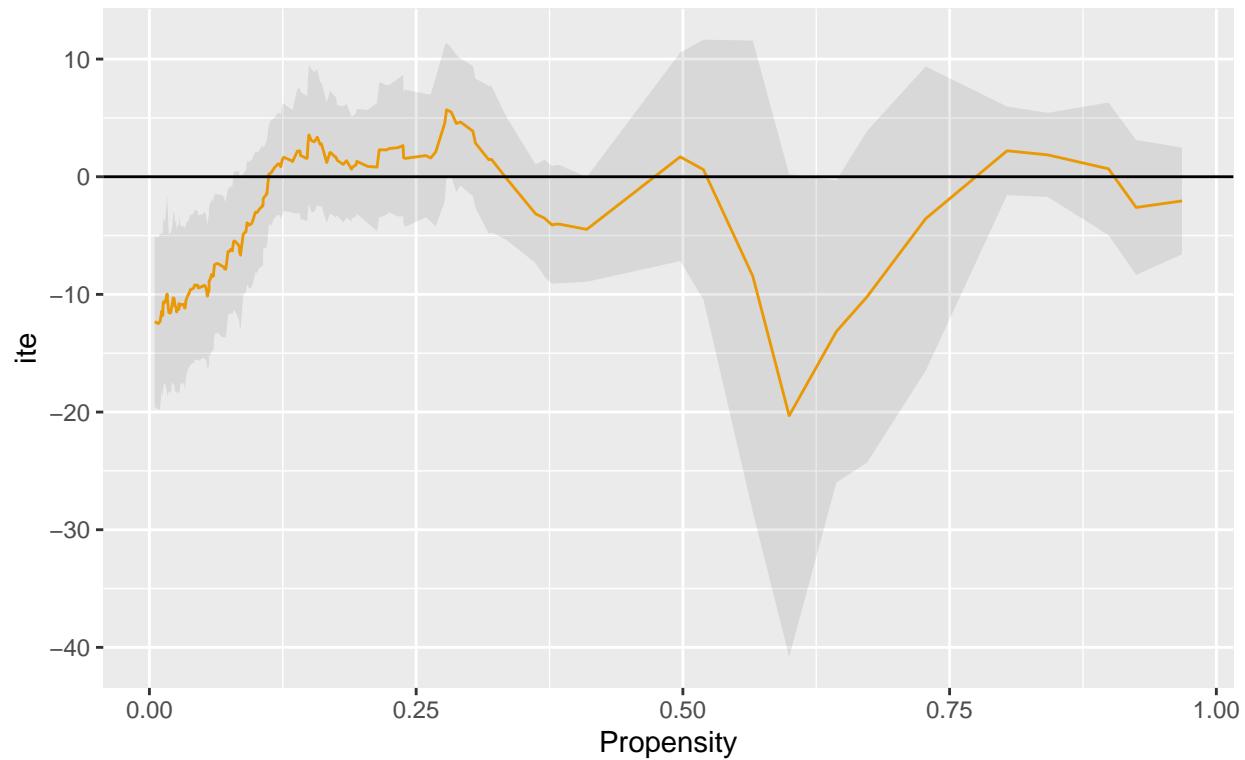
Upper ATE (Yes-No): -5.001 (Std.Error: 3.078)
Observational differences in treatment 0.143 (Yes-No)

```
treatment      outcome  
1:          Yes -2.502714  
2:         No -2.645953
```

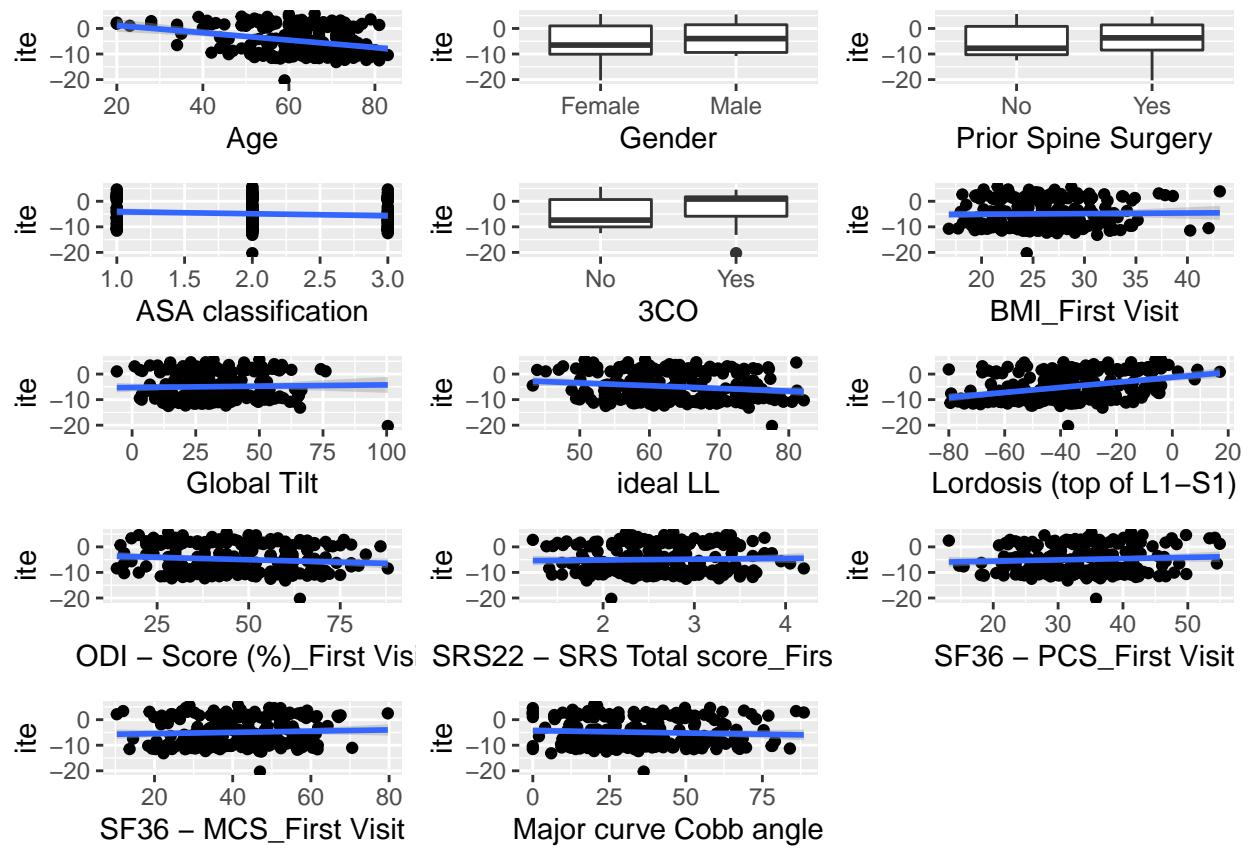
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity 1Y. T1 Sagittal Tilt



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 2Y. T1 Sagittal Tilt

Distribution:

0%	25%	50%	75%	100%
-31.332362	-5.685001	-1.366539	1.078189	10.268933

Model Type Y: boosting

RMSE: 8.48189829906863

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.8

min_child_weight: 1.0

subsample: 0.625

Model Type No: boosting

RMSE: 5.39779794564819

Params: nrounds: 50.0

max_depth: 1

eta: 0.4

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

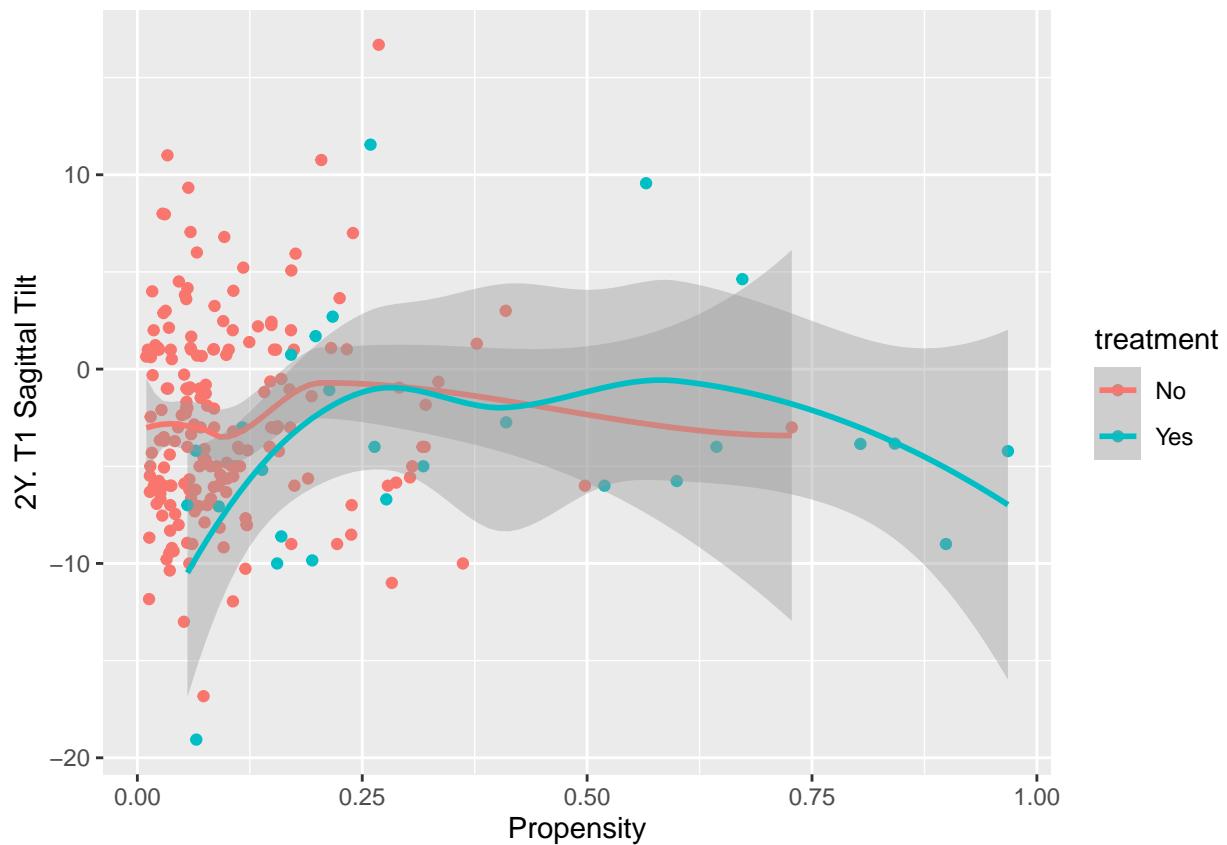
ATE (Yes-No): -5.775 (Std.Error: 1.53)

Trimmed ATE (Yes-No): -5.753 (Std.Error: 1.594)

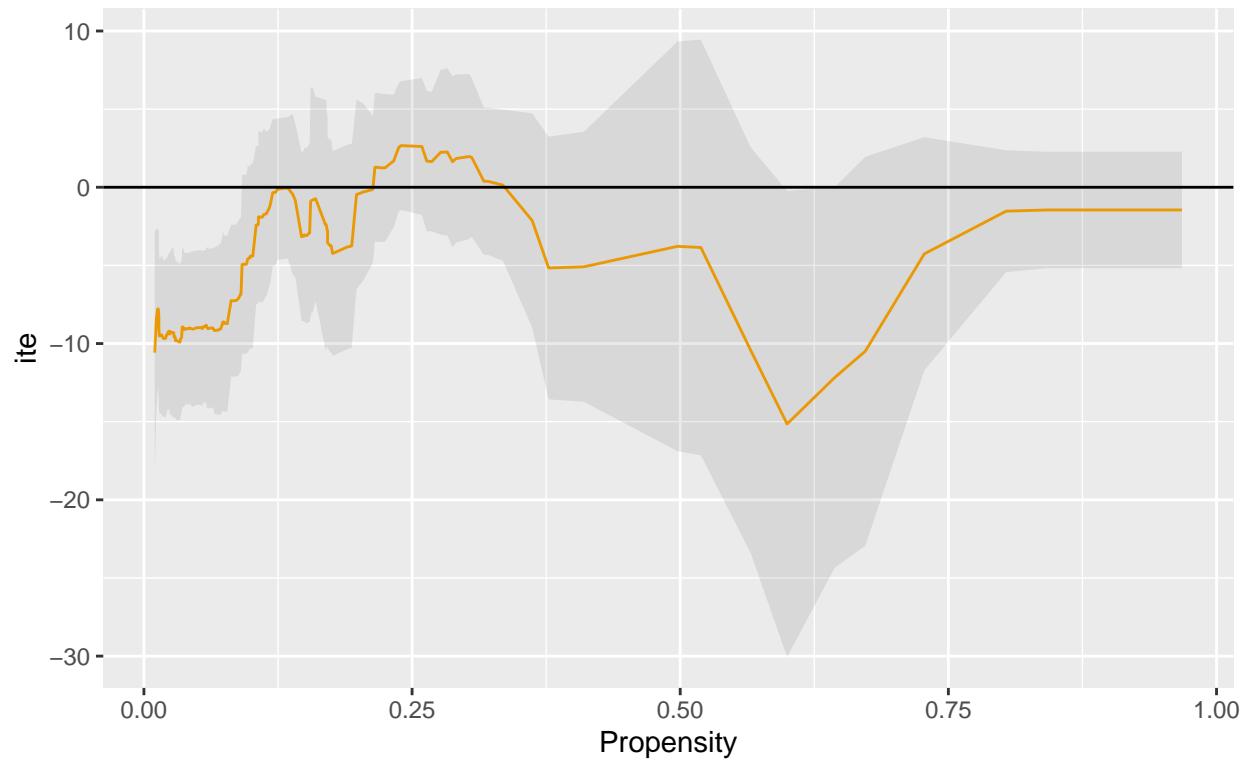
Upper ATE (Yes-No): -6.223 (Std.Error: 3.324)
Observational differences in treatment -0.997 (Yes-No)

```
treatment    outcome  
1:        Yes -3.676968  
2:       No -2.680294
```

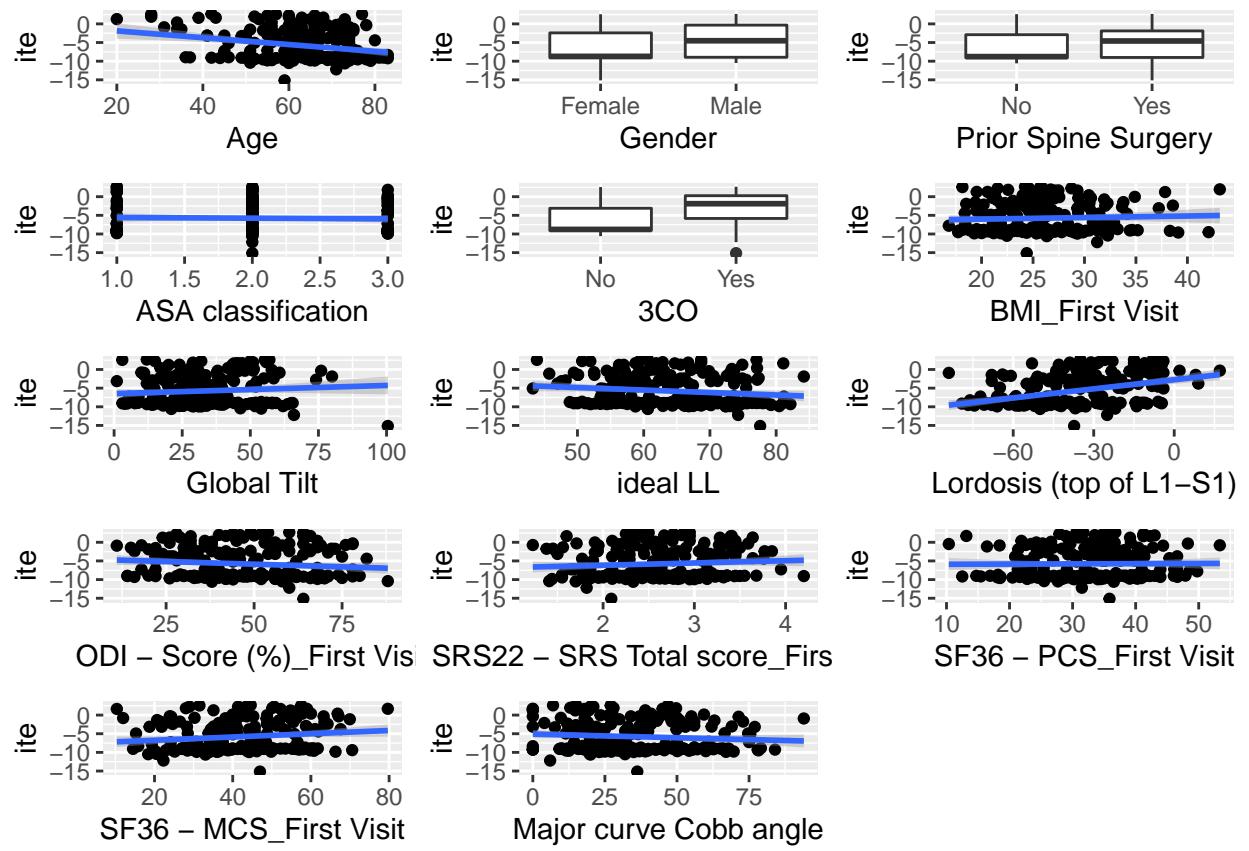
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity 2Y. T1 Sagittal Tilt



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 6W. Sagittal Balance
Distribution:

0%	25%	50%	75%	100%
-194.79	-68.55	-27.01	2.10	114.15

Model Type Y: boosting

RMSE: 54.6637158869221

Params: nrounds: 50.0

max_depth: 2

eta: 0.4

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 0.625

Model Type No: boosting

RMSE: 52.9869569217544

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

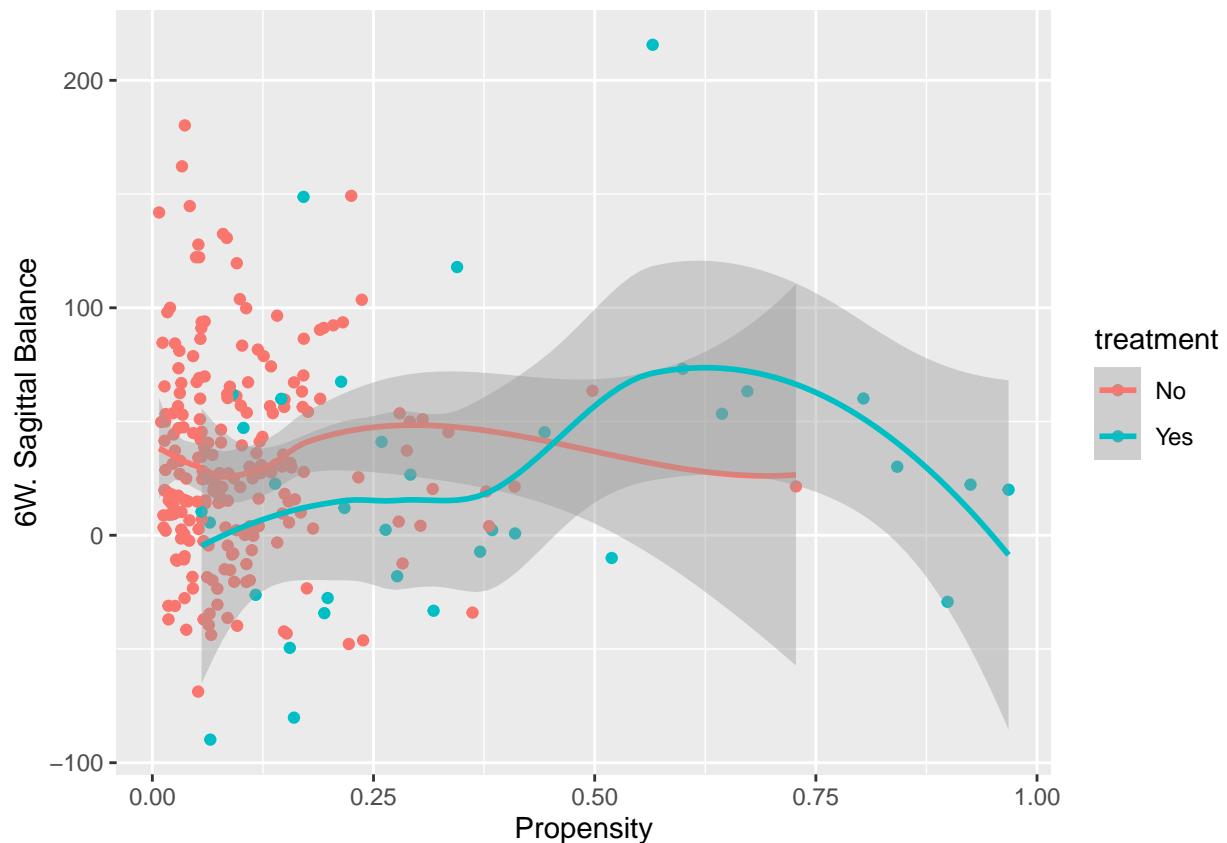
ATE (Yes-No): -56.731 (Std.Error: 11.606)

Trimmed ATE (Yes-No): -58.216 (Std.Error: 12.063)

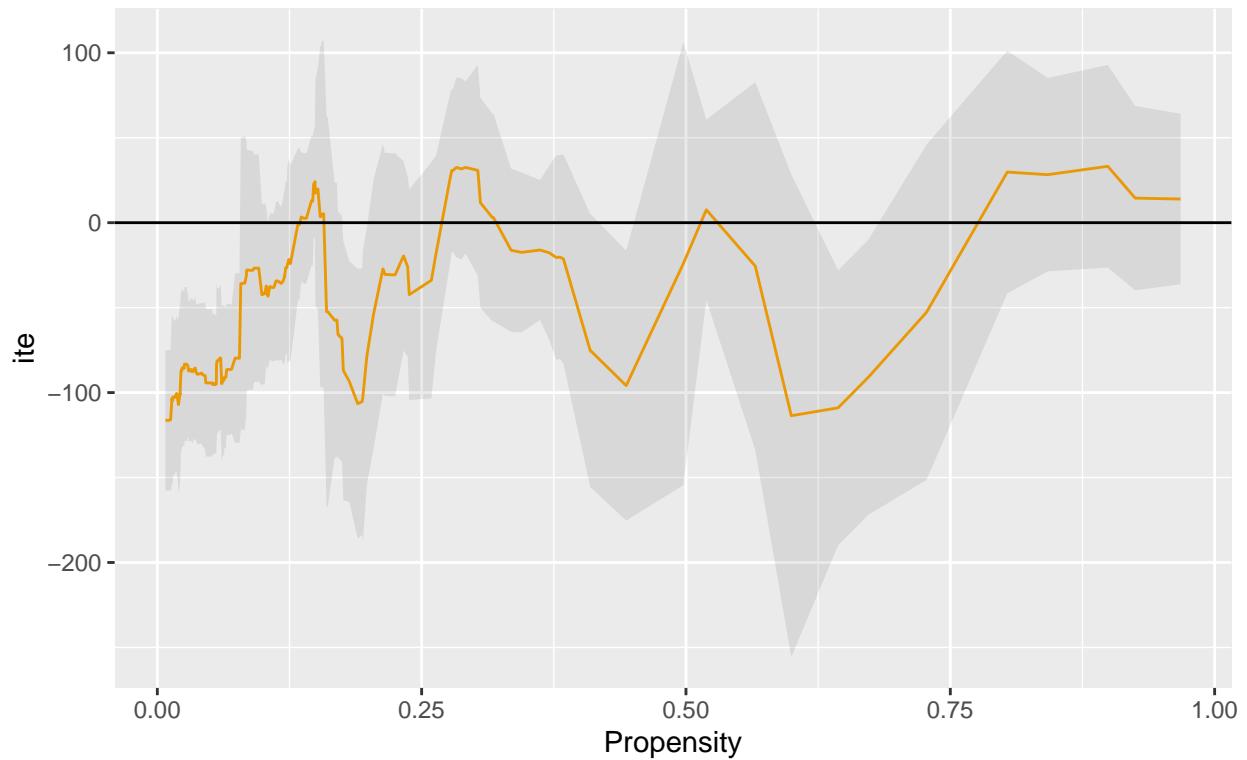
Upper ATE (Yes-No): -24.049 (Std.Error: 26.903)
Observational differences in treatment -8.982 (Yes-No)

```
treatment outcome  
1: Yes 23.00886  
2: No 31.99110
```

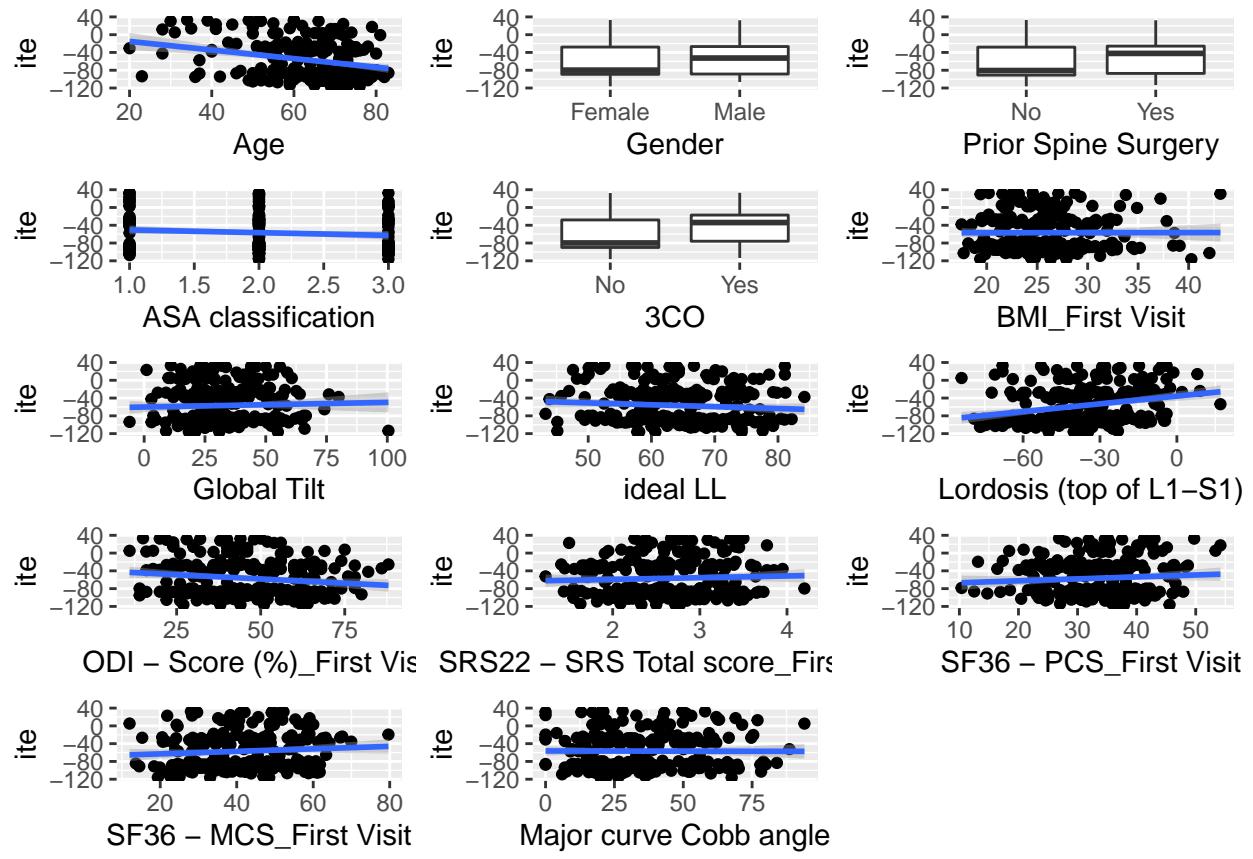
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity 6W. Sagittal Balance



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 1Y. Sagittal Balance

Distribution:

0%	25%	50%	75%	100%
-237.47	-62.47	-28.13	7.24	109.54

Model Type Y: boosting

RMSE: 53.9200466401312

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

Model Type No: boosting

RMSE: 51.042785162872

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

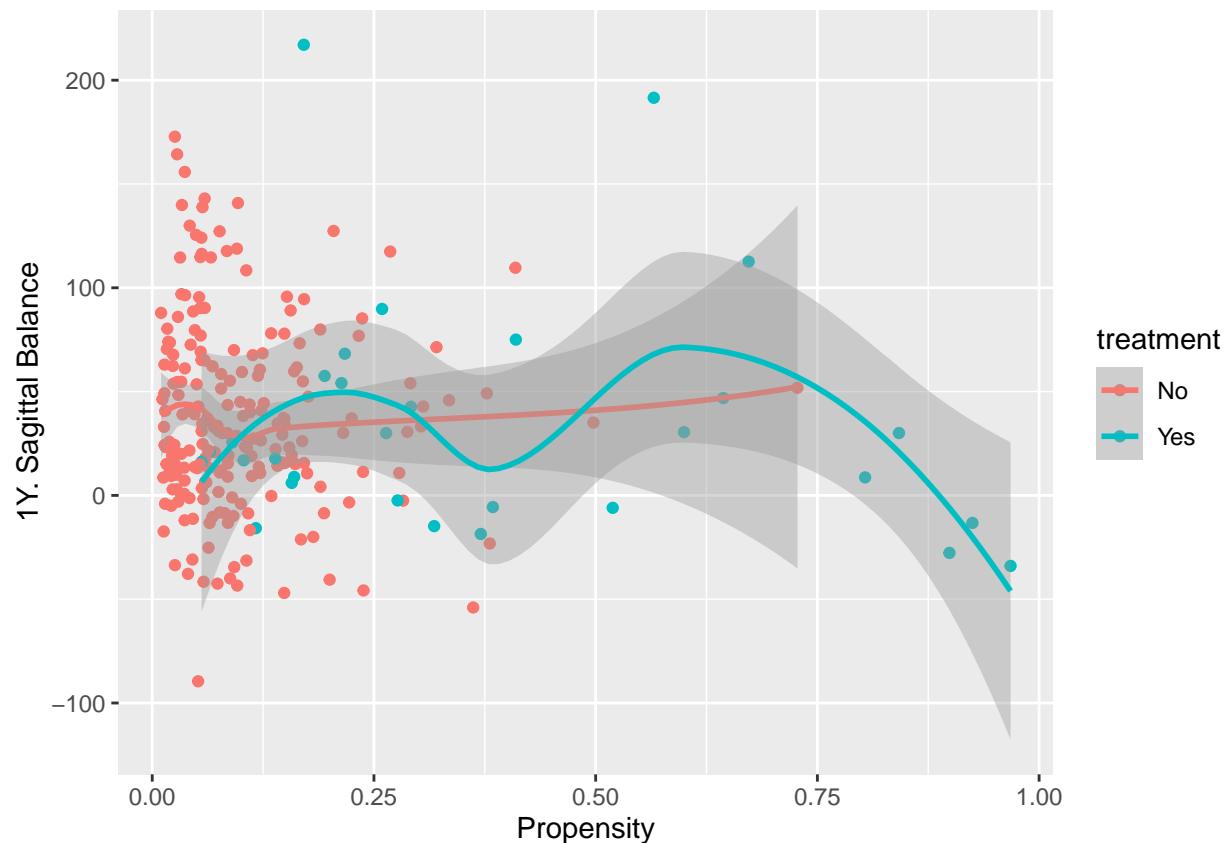
ATE (Yes-No): -45.702 (Std.Error: 10.171)

Trimmed ATE (Yes-No): -45.298 (Std.Error: 10.773)

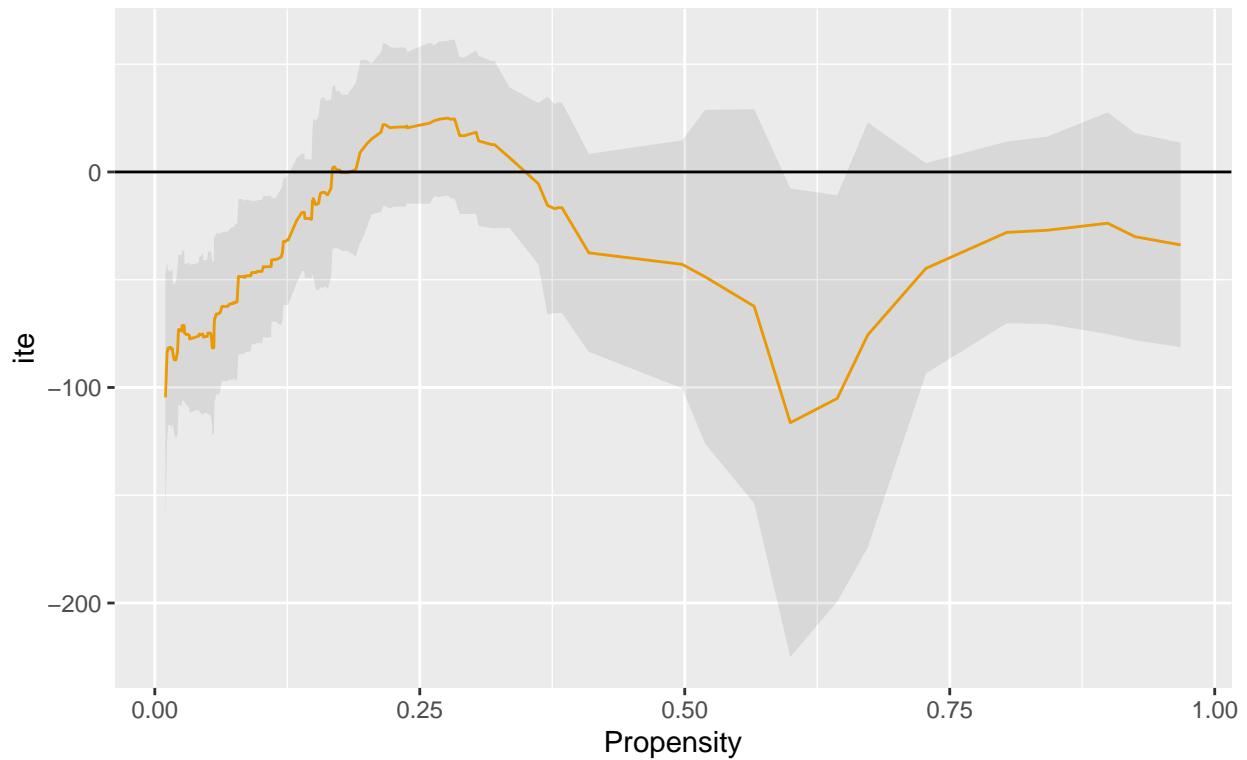
Upper ATE (Yes-No): -54.148 (Std.Error: 25.123)
Observational differences in treatment -3.004 (Yes-No)

treatment outcome
1: Yes 34.28567
2: No 37.29009

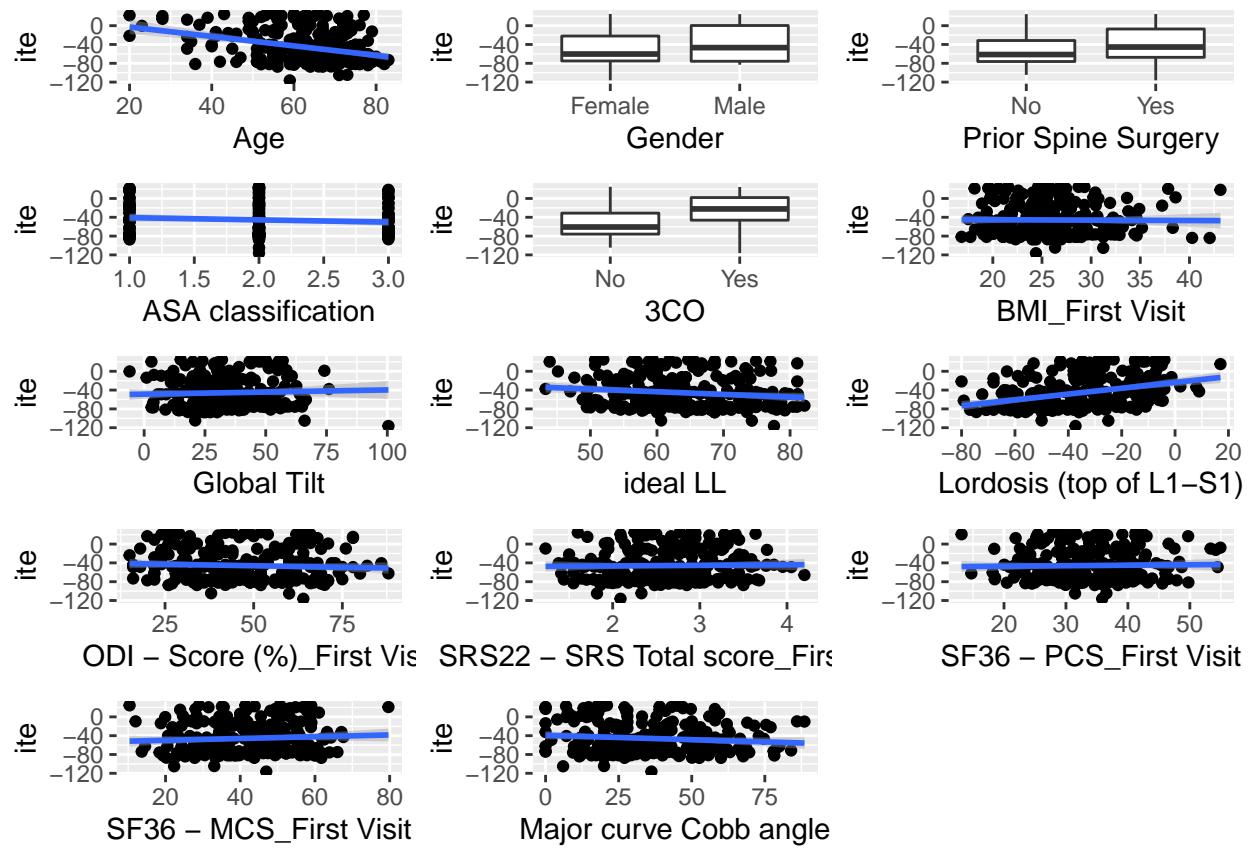
'geom_smooth()' using method = 'loess' and formula 'y ~ x'



Individual Treatment effect by propensity 1Y. Sagittal Balance



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 2Y. Sagittal Balance
Distribution:

0%	25%	50%	75%	100%
-252.690	-56.225	-17.085	7.660	107.700

Model Type Y: boosting

RMSE: 61.4353912959945

Params: nrounds: 50.0

max_depth: 1

eta: 0.4

gamma: 0.0

colsample_bytree: 0.8

min_child_weight: 1.0

subsample: 0.625

Model Type No: boosting

RMSE: 51.4026073251086

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 0.625

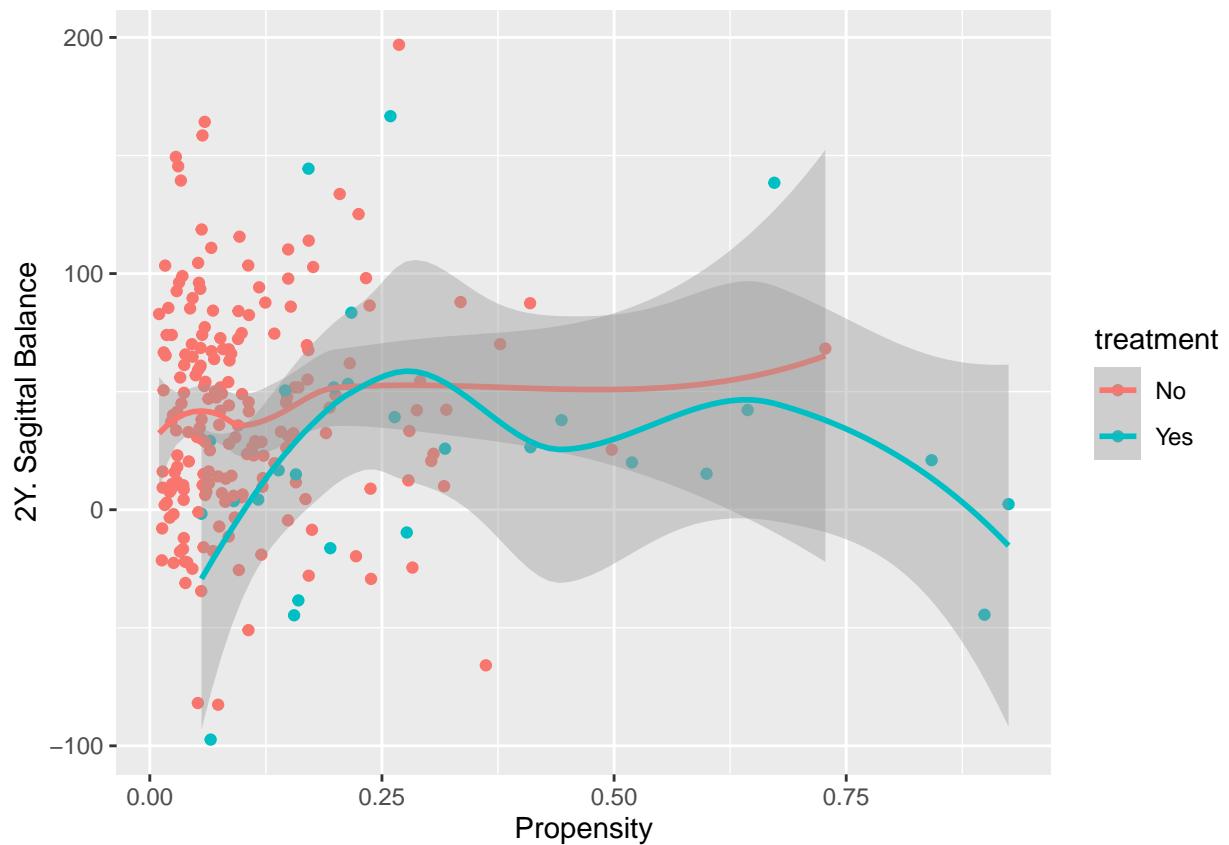
ATE (Yes-No): -55.326 (Std.Error: 9.875)

Trimmed ATE (Yes-No): -54.498 (Std.Error: 10.053)

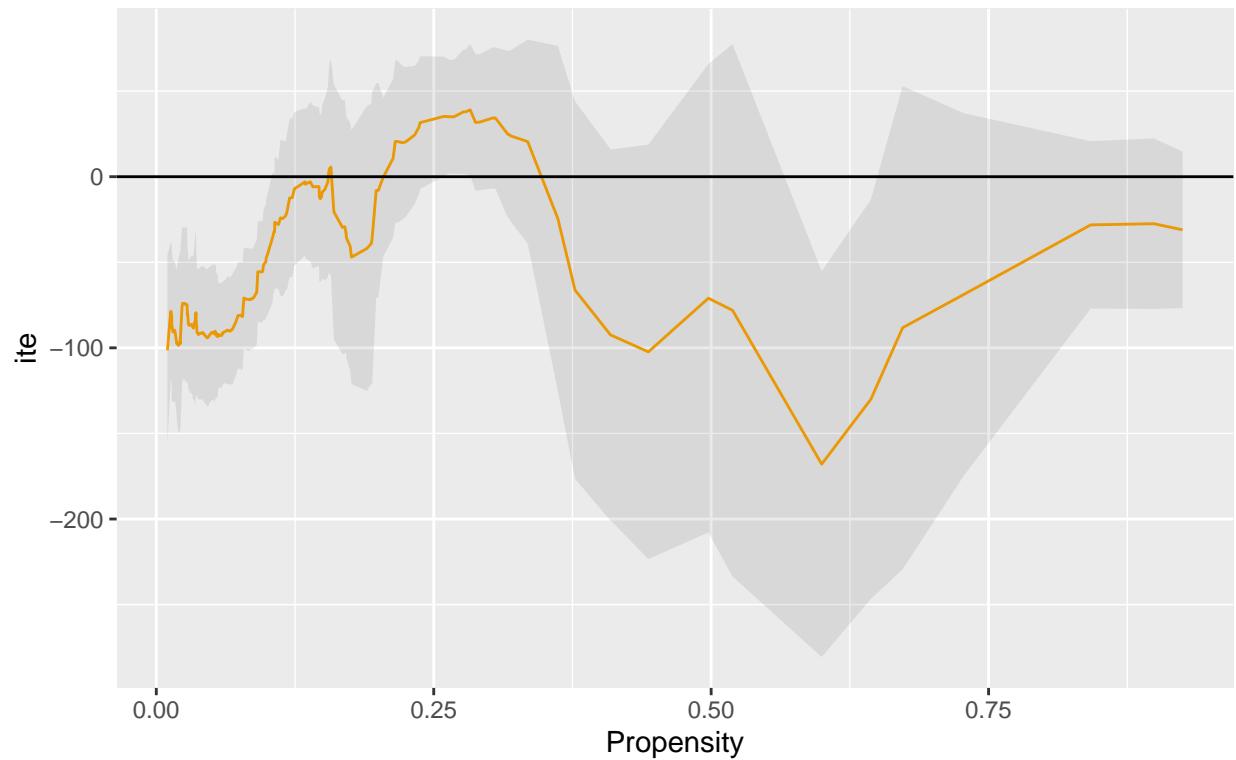
Upper ATE (Yes-No): -77.484 (Std.Error: 35.664)
Observational differences in treatment -14.719 (Yes-No)

```
treatment    outcome  
1:          Yes 26.24857  
2:         No 40.96763
```

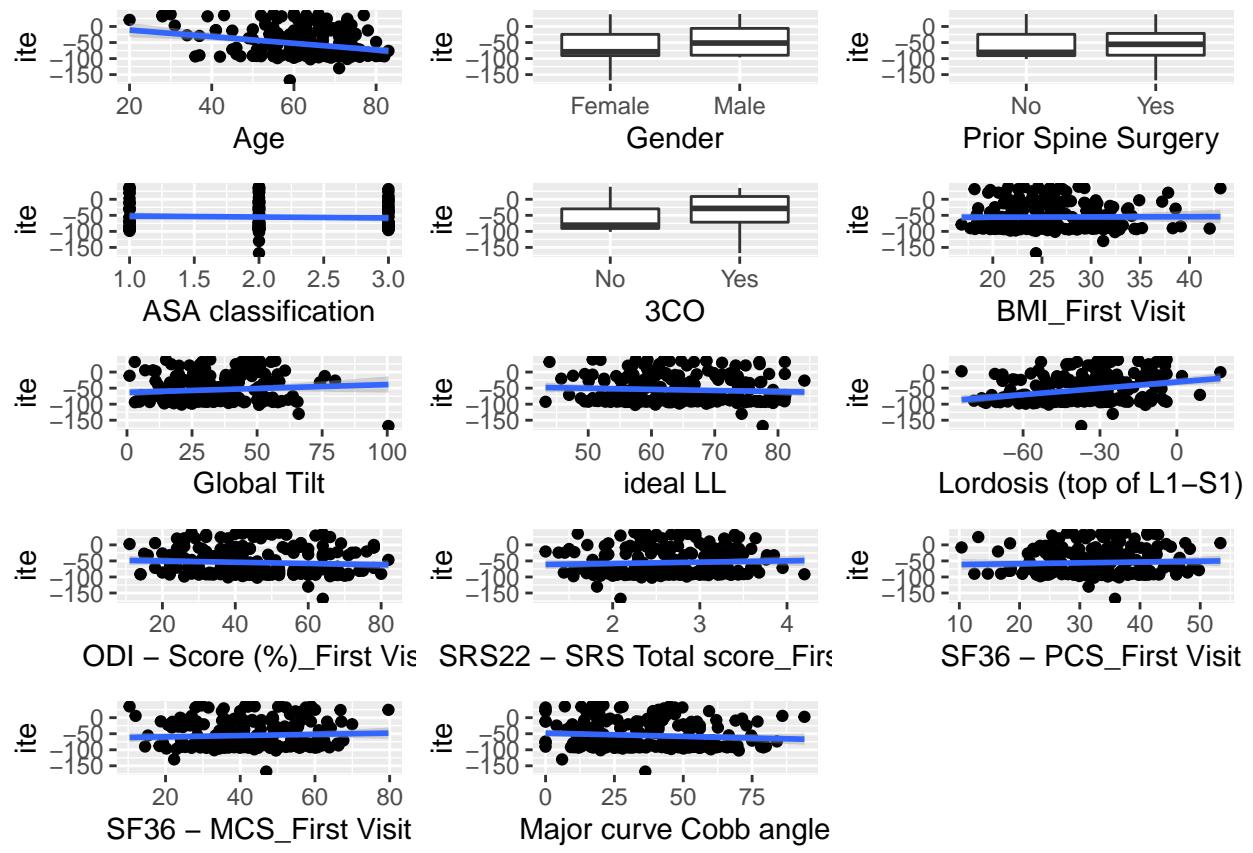
'geom_smooth()' using method = 'loess' and formula 'y ~ x'



Individual Treatment effect by propensity 2Y. Sagittal Balance



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 6W. Global Tilt

Distribution:

0%	25%	50%	75%	100%
-68.6200	-18.0175	-6.0000	1.8425	16.0000

Model Type Y: boosting

RMSE: 16.3570669199224

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

Model Type No: boosting

RMSE: 12.0925340298252

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

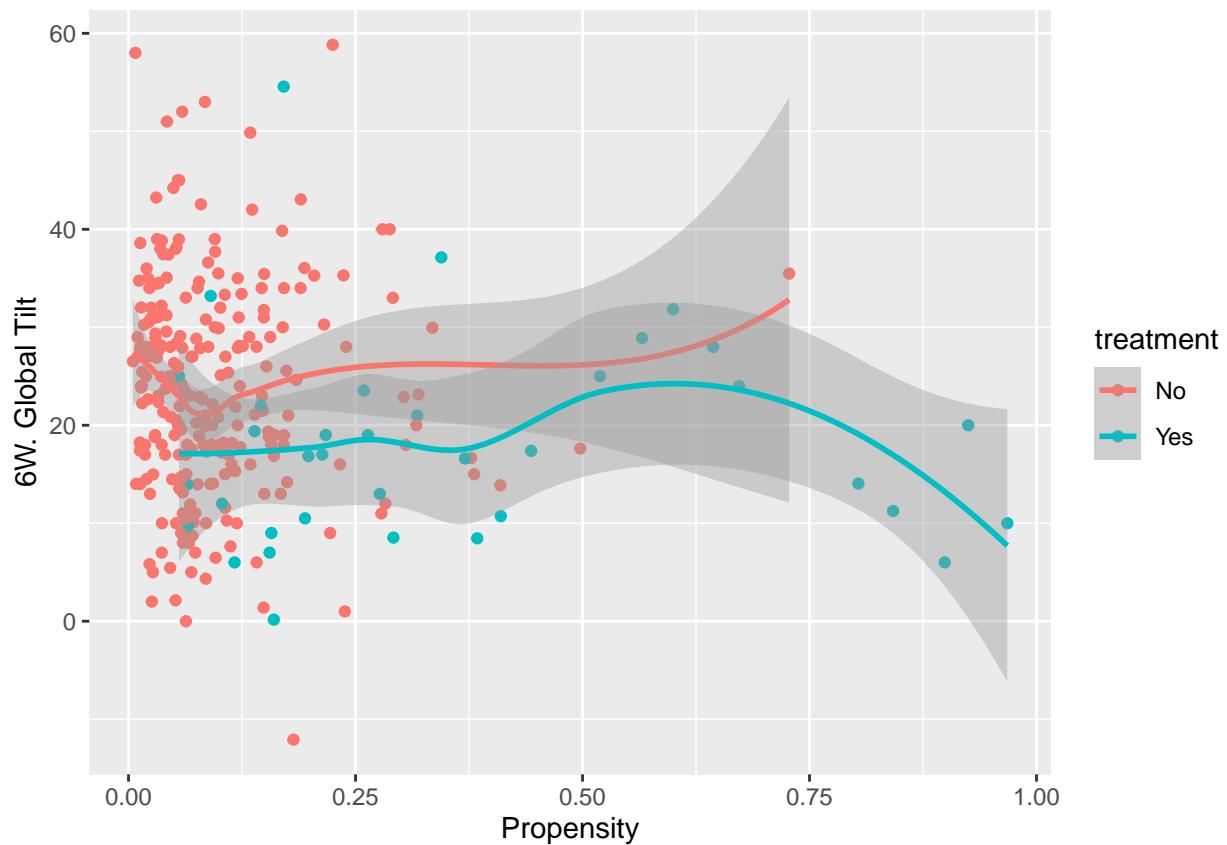
ATE (Yes-No): -15.771 (Std.Error: 3.902)

Trimmed ATE (Yes-No): -15.891 (Std.Error: 4.047)

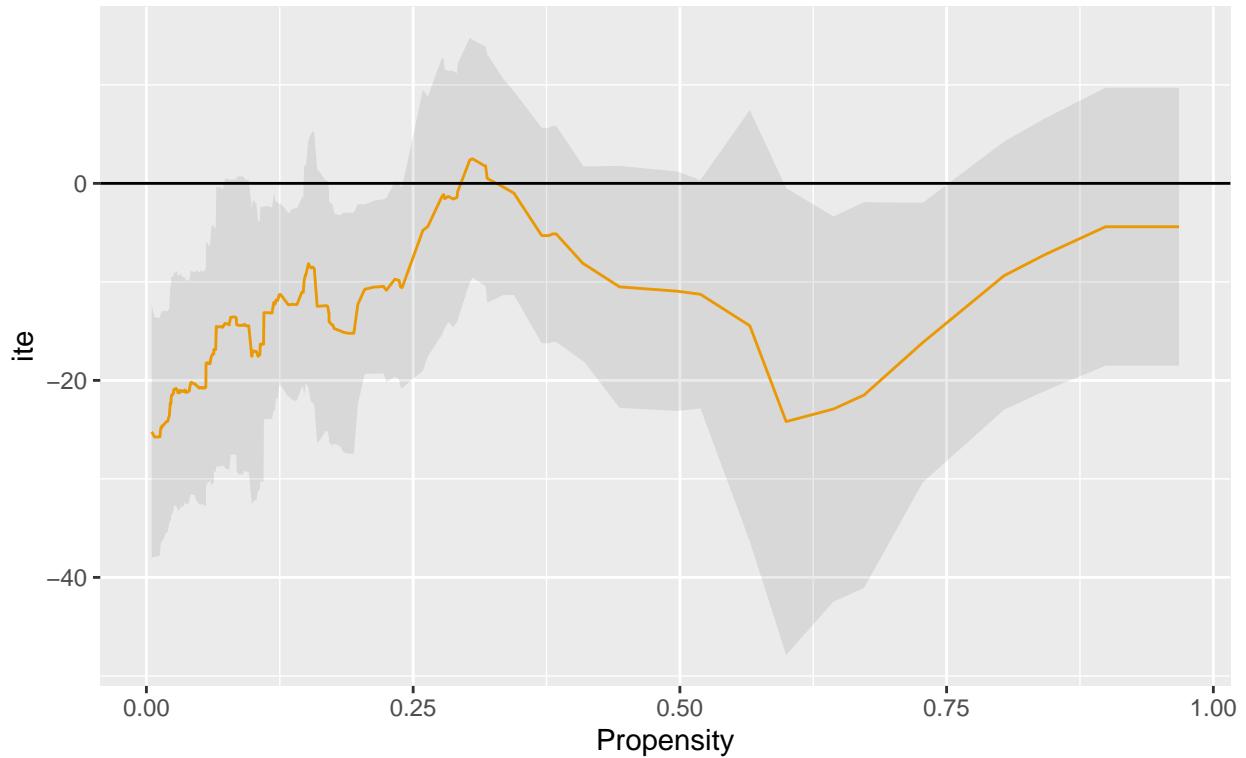
Upper ATE (Yes-No): -12.753 (Std.Error: 6.326)
Observational differences in treatment -5.812 (Yes-No)

```
treatment outcome  
1: Yes 18.04944  
2: No 23.86111
```

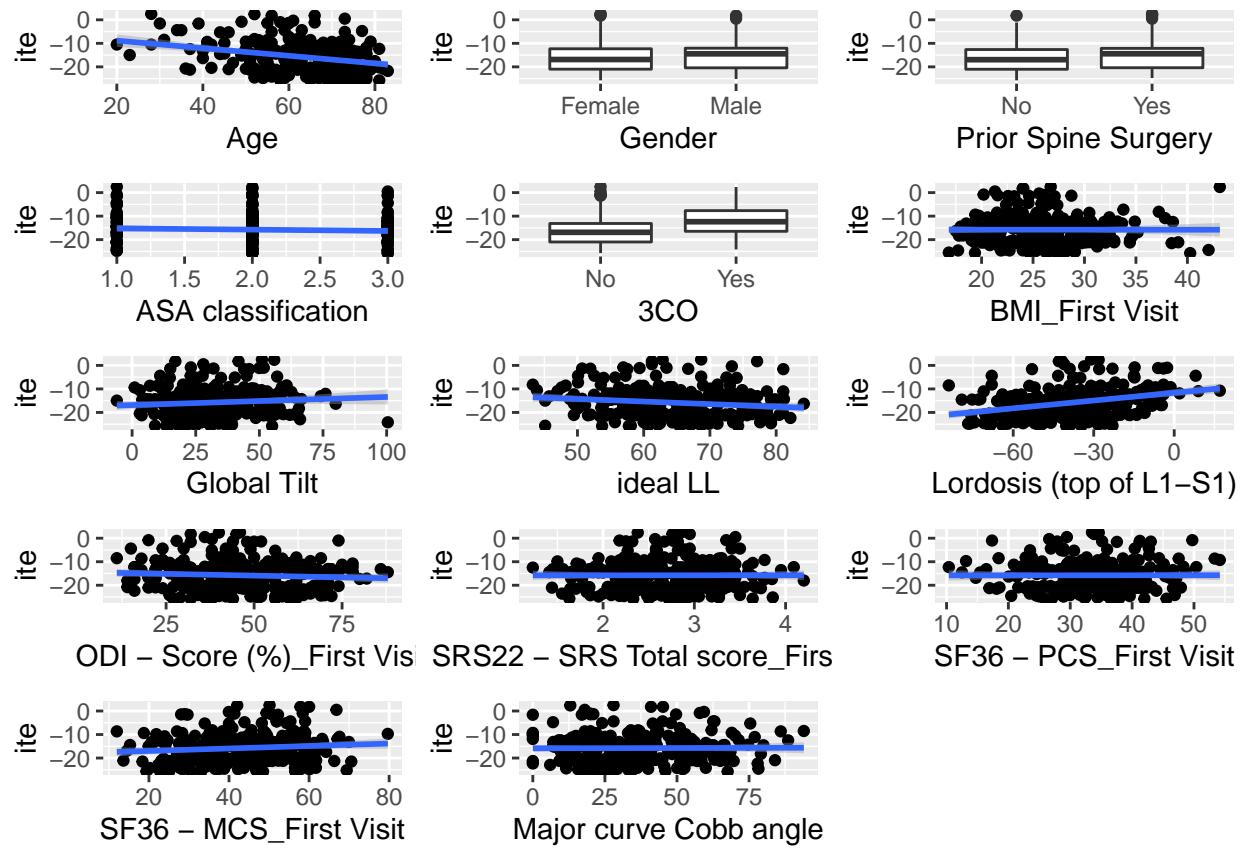
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity 6W. Global Tilt



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 1Y. Global Tilt

Distribution:

0%	25%	50%	75%	100%
-62.630	-15.715	-5.100	1.000	26.000

Model Type Y: boosting

RMSE: 16.10163571907

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

Model Type No: boosting

RMSE: 11.3340187358851

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

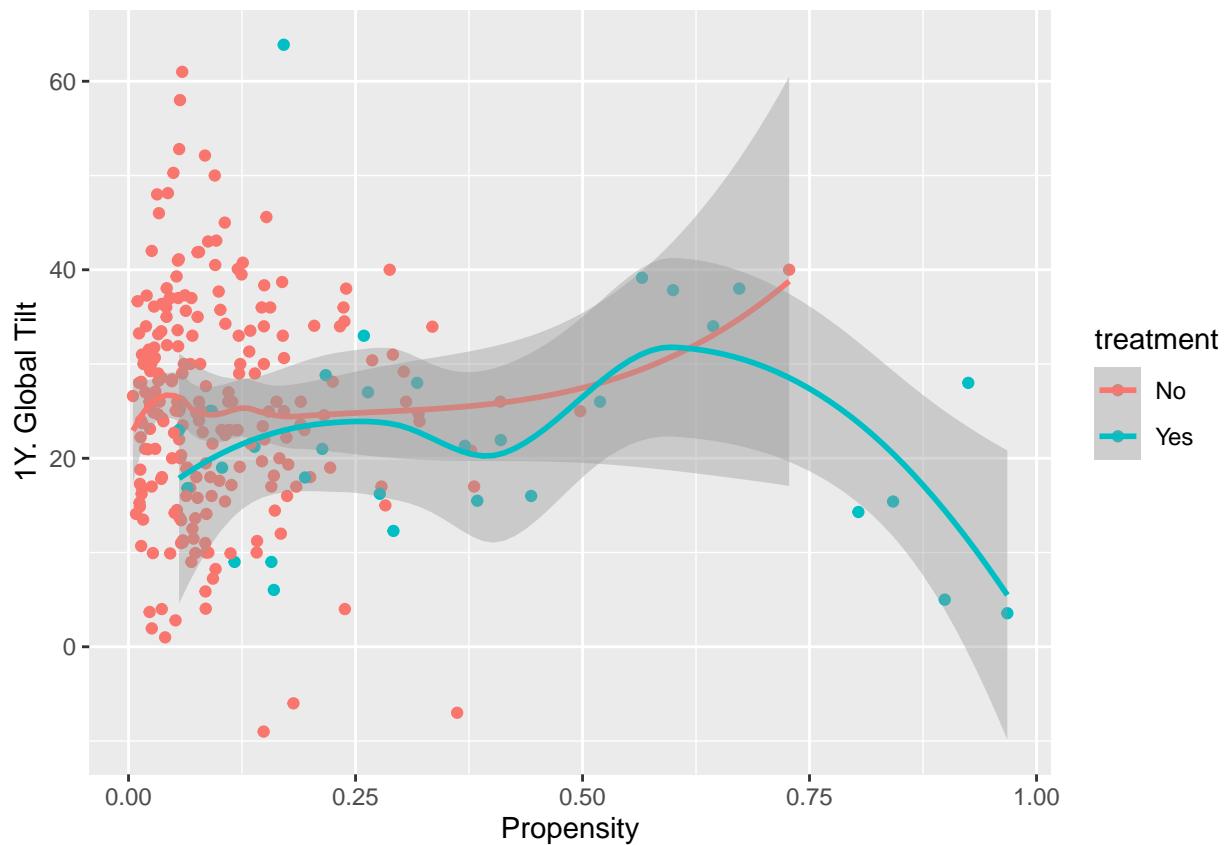
ATE (Yes-No): -16.019 (Std.Error: 2.445)

Trimmed ATE (Yes-No): -16.119 (Std.Error: 2.505)

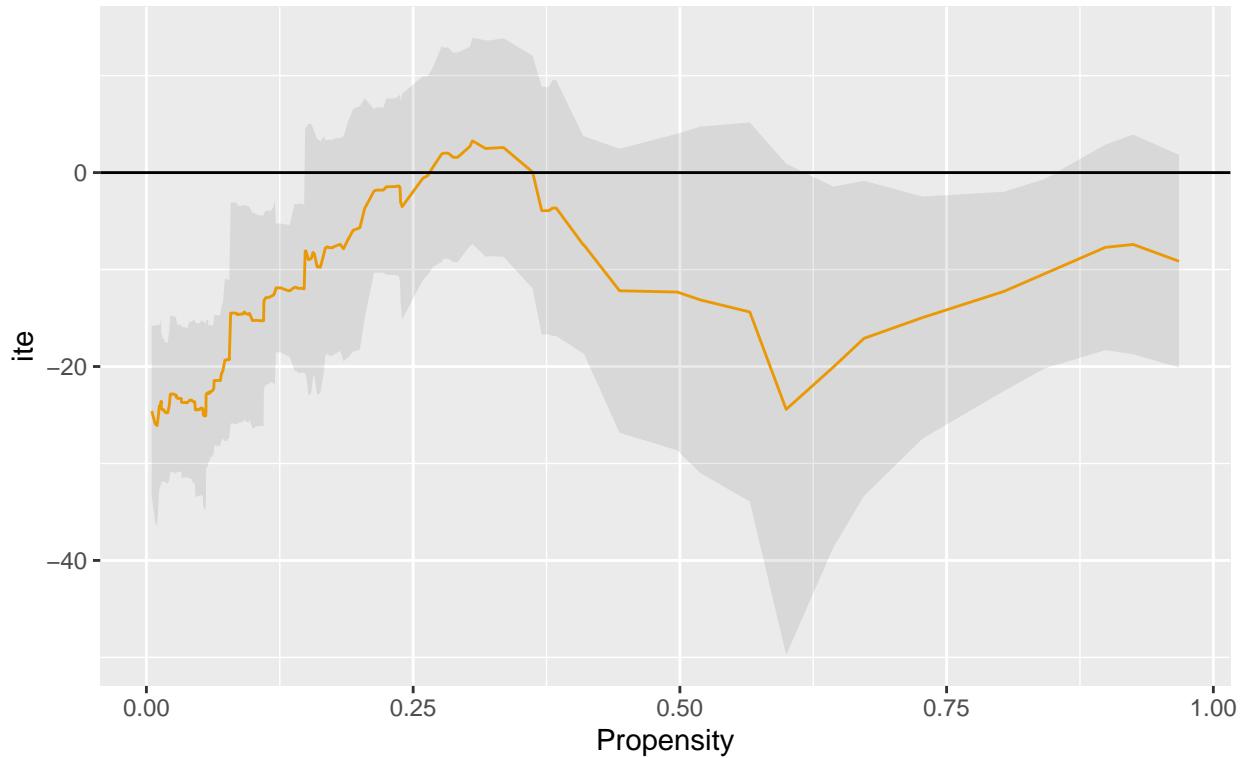
Upper ATE (Yes-No): -13.723 (Std.Error: 5.204)
Observational differences in treatment -3.087 (Yes-No)

```
treatment outcome  
1: Yes 22.36419  
2: No 25.45107
```

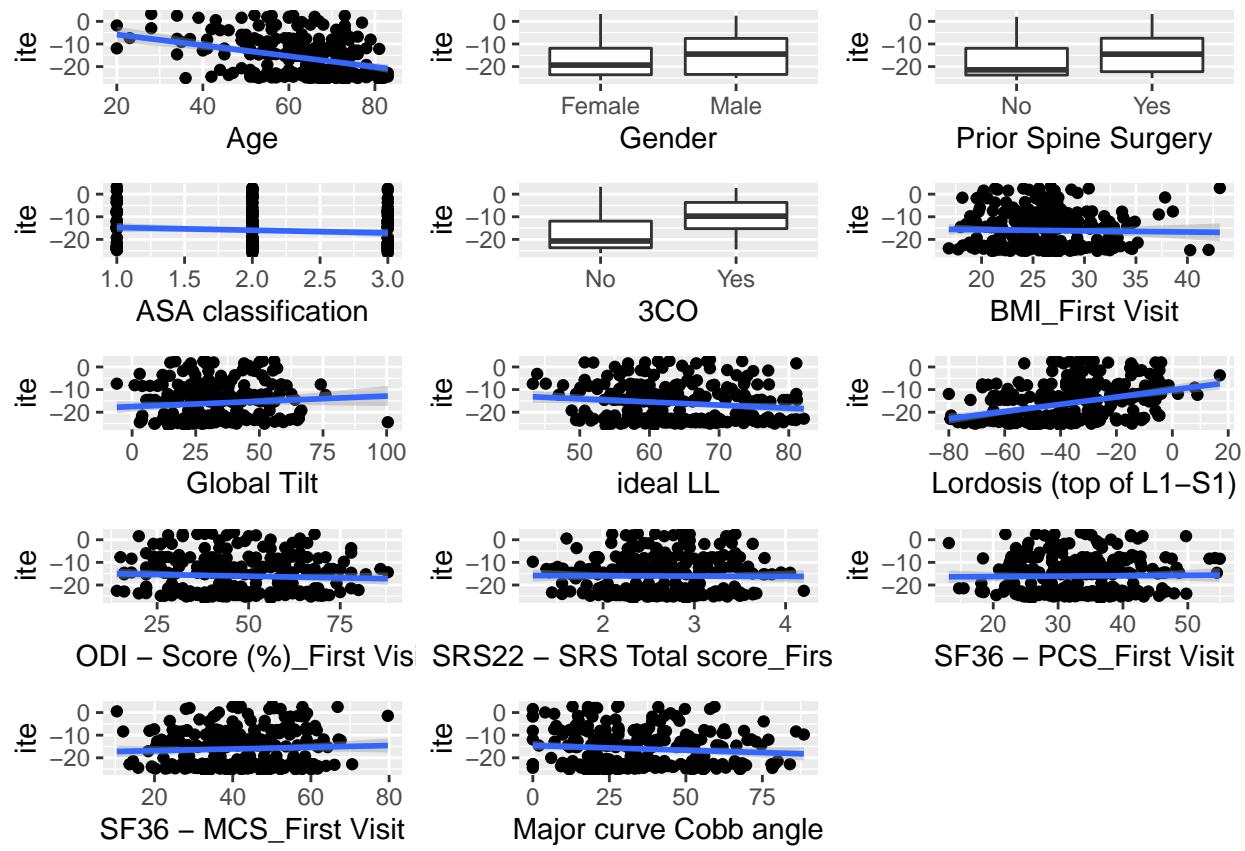
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity 1Y. Global Tilt



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 2Y. Global Tilt

Distribution:

0%	25%	50%	75%	100%
-65.2300	-12.6725	-4.0450	2.1525	20.0000

Model Type Y: boosting

RMSE: 14.203271757765

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.8

min_child_weight: 1.0

subsample: 0.5

Model Type No: boosting

RMSE: 10.7775482258686

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

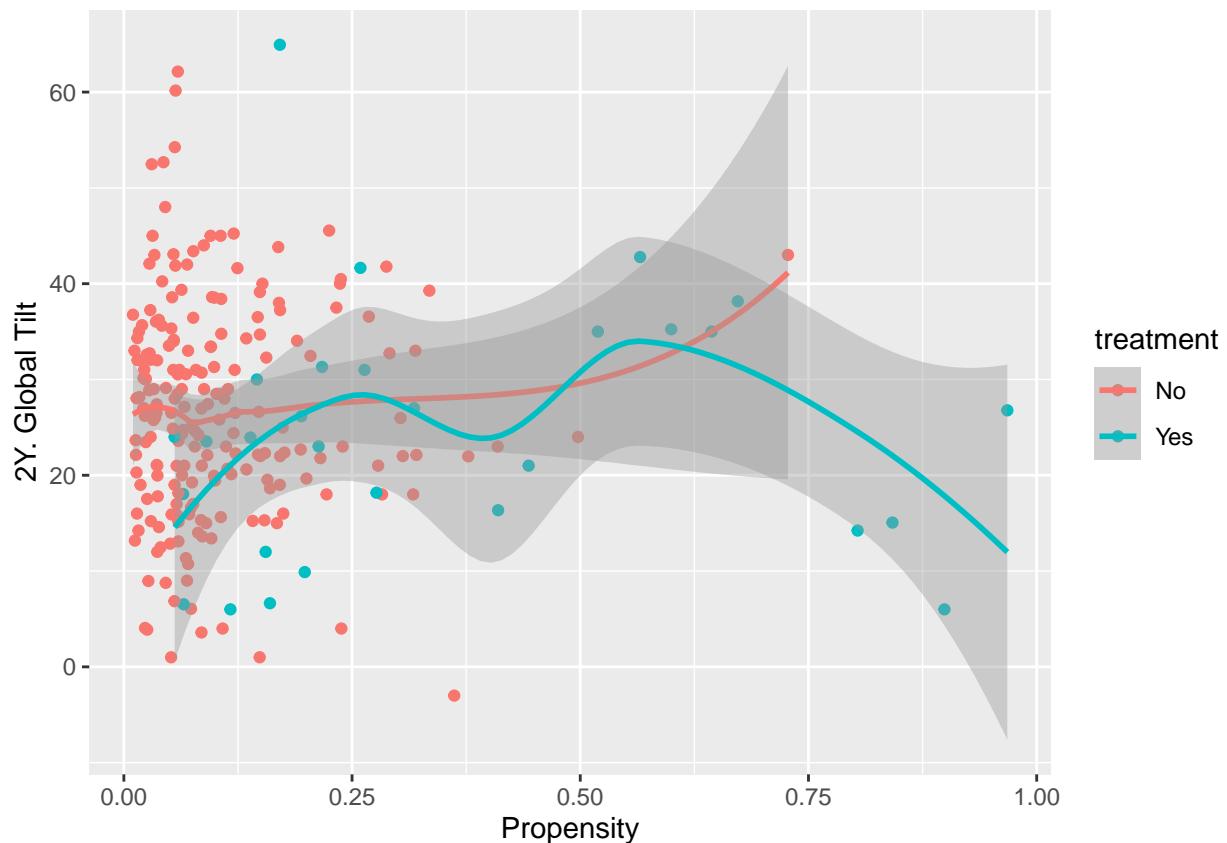
ATE (Yes-No): -13.792 (Std.Error: 2.99)

Trimmed ATE (Yes-No): -13.762 (Std.Error: 3.096)

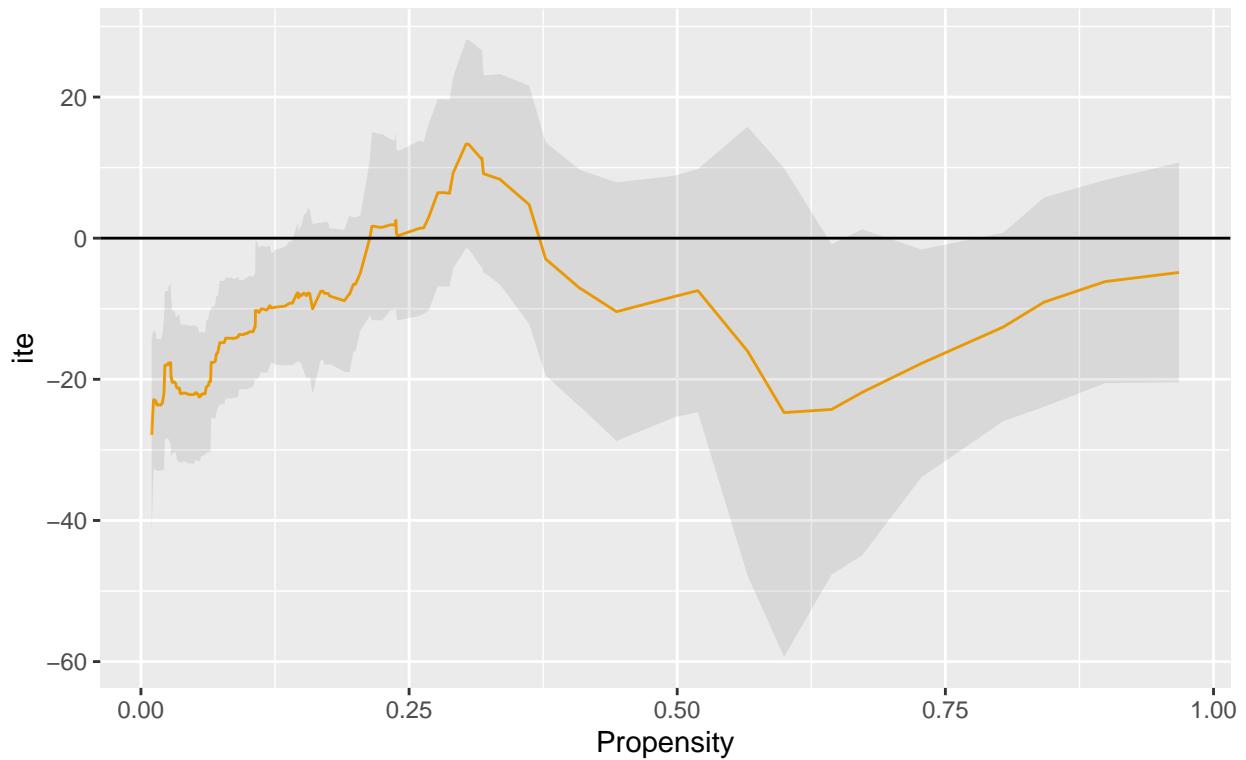
Upper ATE (Yes-No): -14.466 (Std.Error: 8.038)
Observational differences in treatment -2.237 (Yes-No)

```
treatment    outcome  
1:          Yes 24.46276  
2:         No 26.70024
```

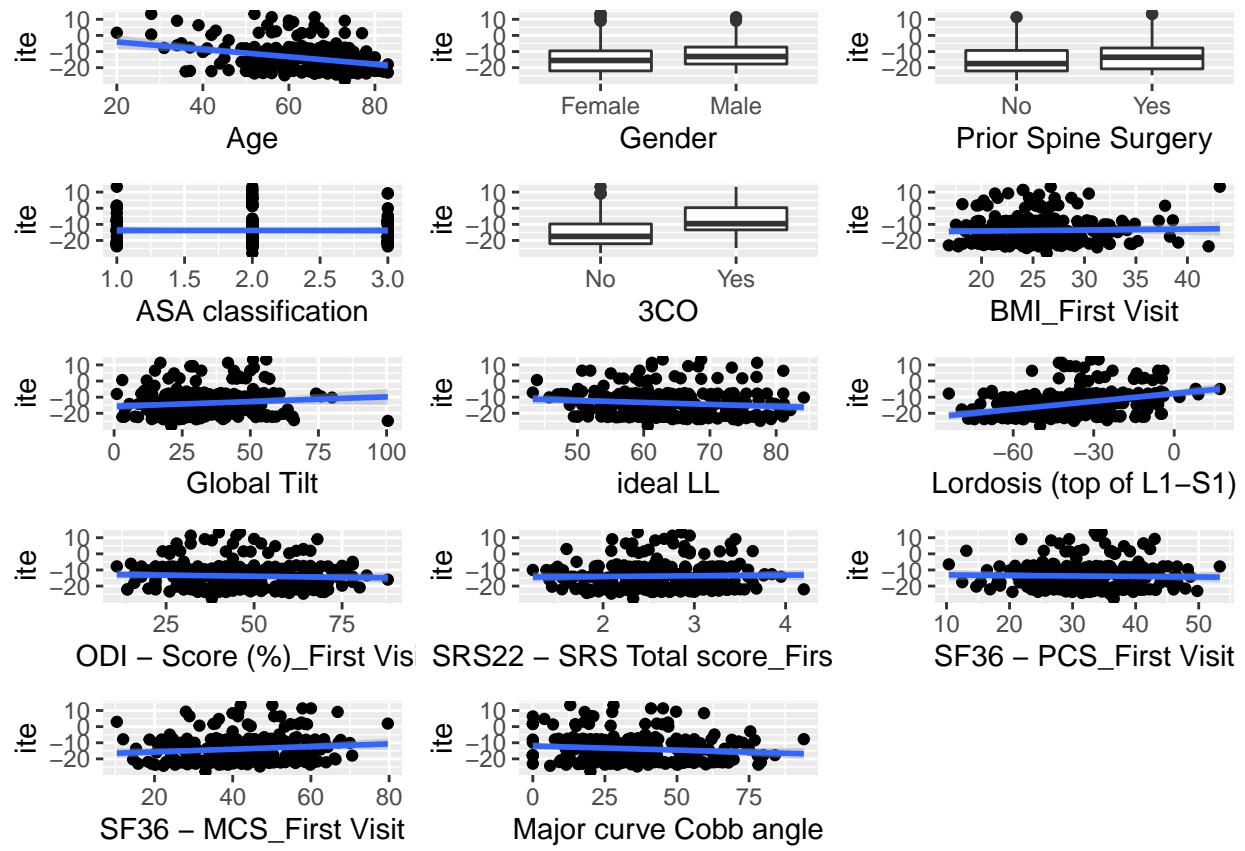
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity 2Y. Global Tilt



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 6W. Lordosis (top of L1-S1)

Distribution:

0%	25%	50%	75%	100%
-65.22	-24.00	-9.38	0.00	29.00

Model Type Y: boosting

RMSE: 20.9601563369729

Params: nrounds: 50.0

max_depth: 1

eta: 0.4

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 0.75

Model Type No: boosting

RMSE: 15.2247581794233

Params: nrounds: 50.0

max_depth: 1

eta: 0.4

gamma: 0.0

colsample_bytree: 0.8

min_child_weight: 1.0

subsample: 0.875

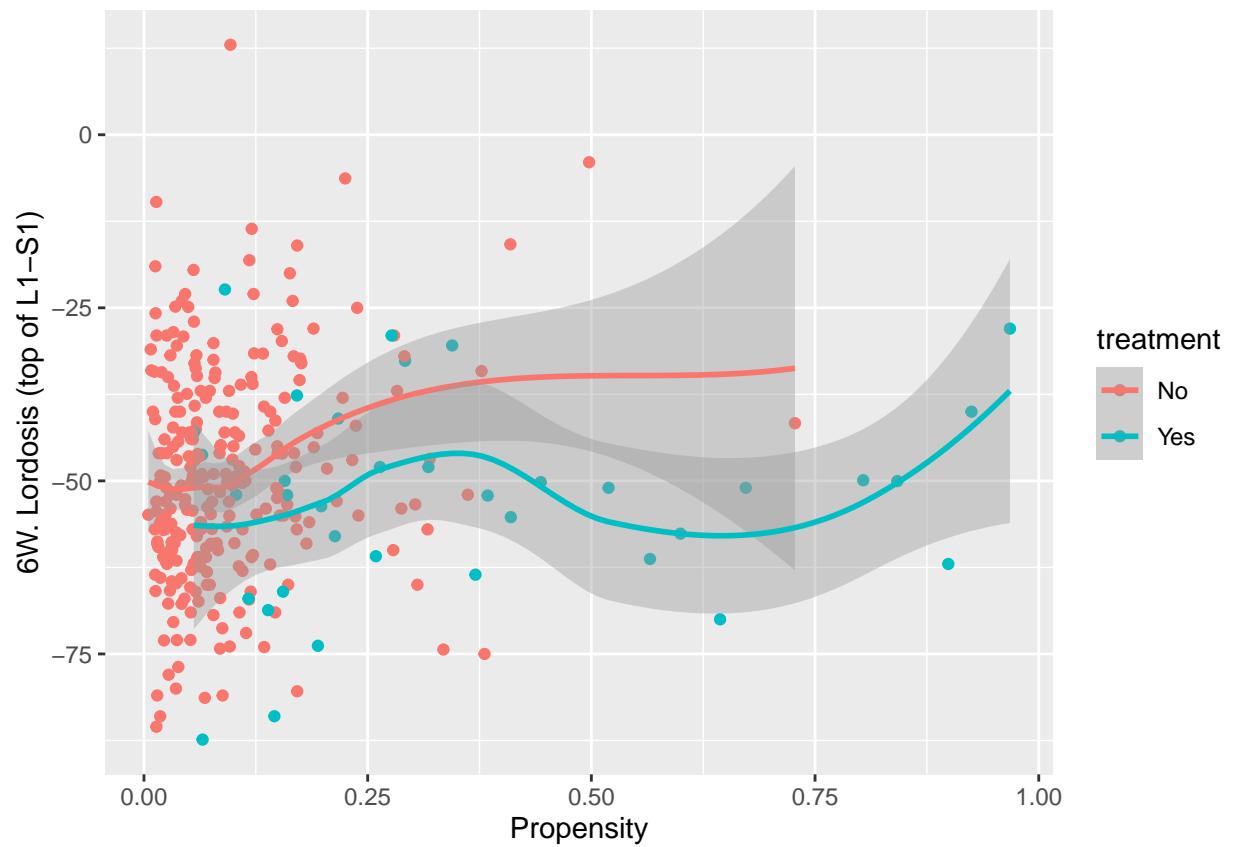
ATE (Yes-No): -8.435 (Std.Error: 5.421)

Trimmed ATE (Yes-No): -8.469 (Std.Error: 5.658)

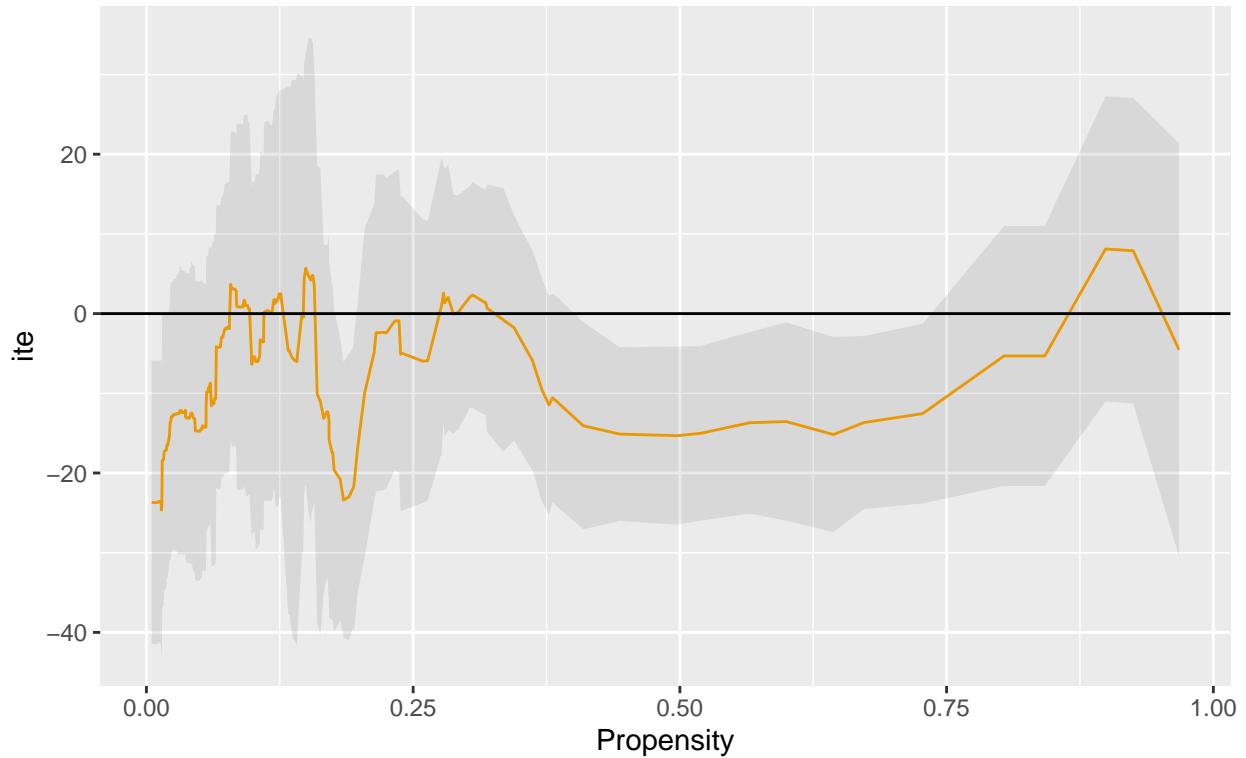
Upper ATE (Yes-No): -7.529 (Std.Error: 5.799)
Observational differences in treatment -3.333 (Yes-No)

```
treatment    outcome  
1:        Yes -52.60333  
2:       No -49.27082
```

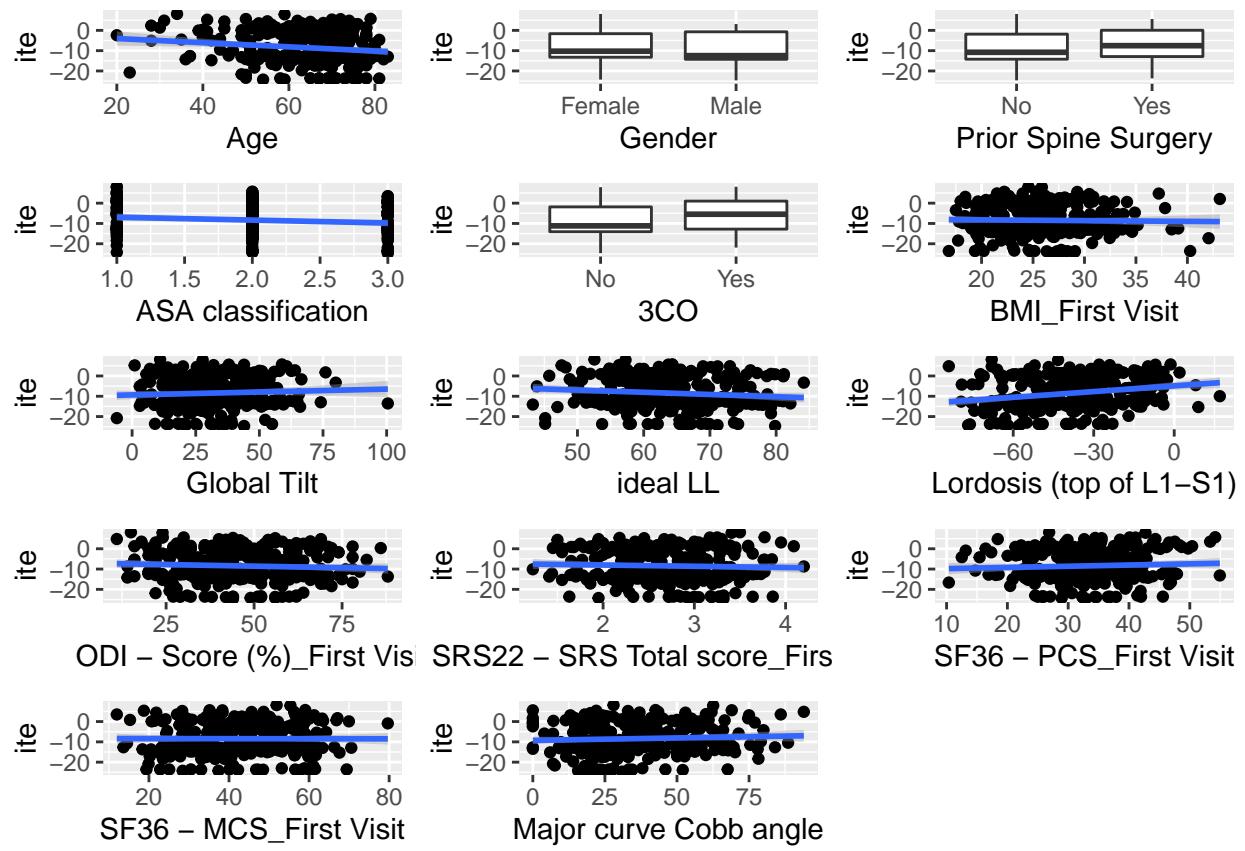
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity
6W. Lordosis (top of L1–S1)



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 1Y. Lordosis (top of L1-S1)

Distribution:

0%	25%	50%	75%	100%
-67.87	-24.56	-7.22	0.00	23.38

Model Type Y: boosting

RMSE: 19.7071918638584

Params: nrounds: 50.0

max_depth: 1

eta: 0.4

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

Model Type No: boosting

RMSE: 15.093599583389

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 0.75

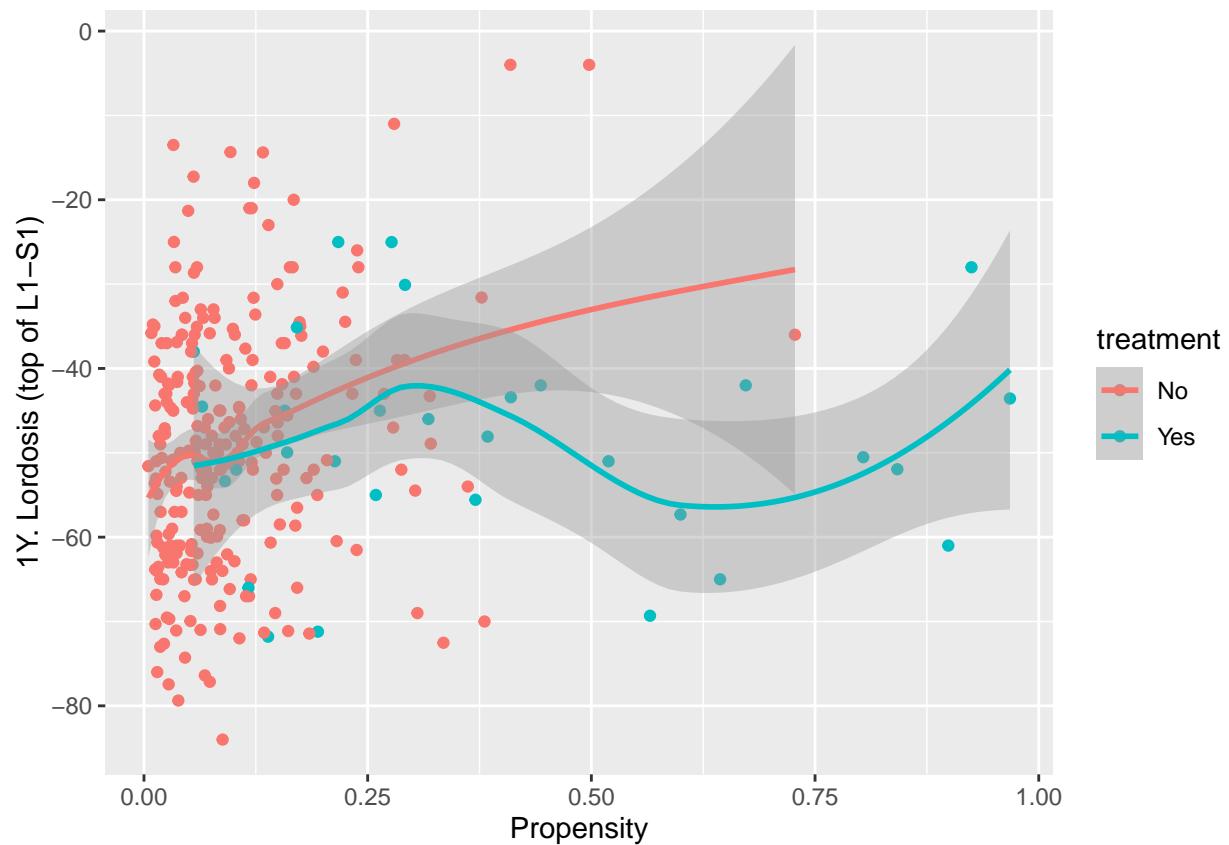
ATE (Yes-No): -12.283 (Std.Error: 4.408)

Trimmed ATE (Yes-No): -12.4 (Std.Error: 4.598)

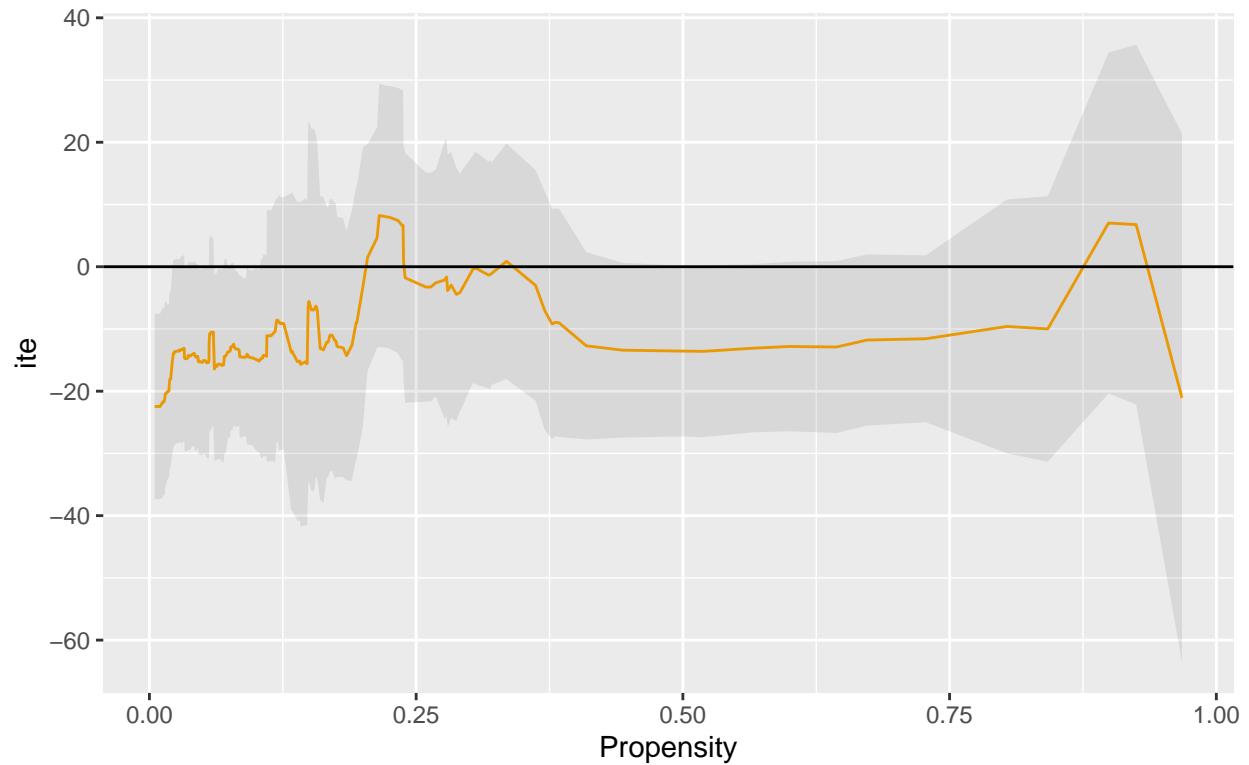
Upper ATE (Yes-No): -9.332 (Std.Error: 7.903)
Observational differences in treatment 0.311 (Yes-No)

```
treatment      outcome  
1:          Yes -48.80097  
2:         No -49.11244
```

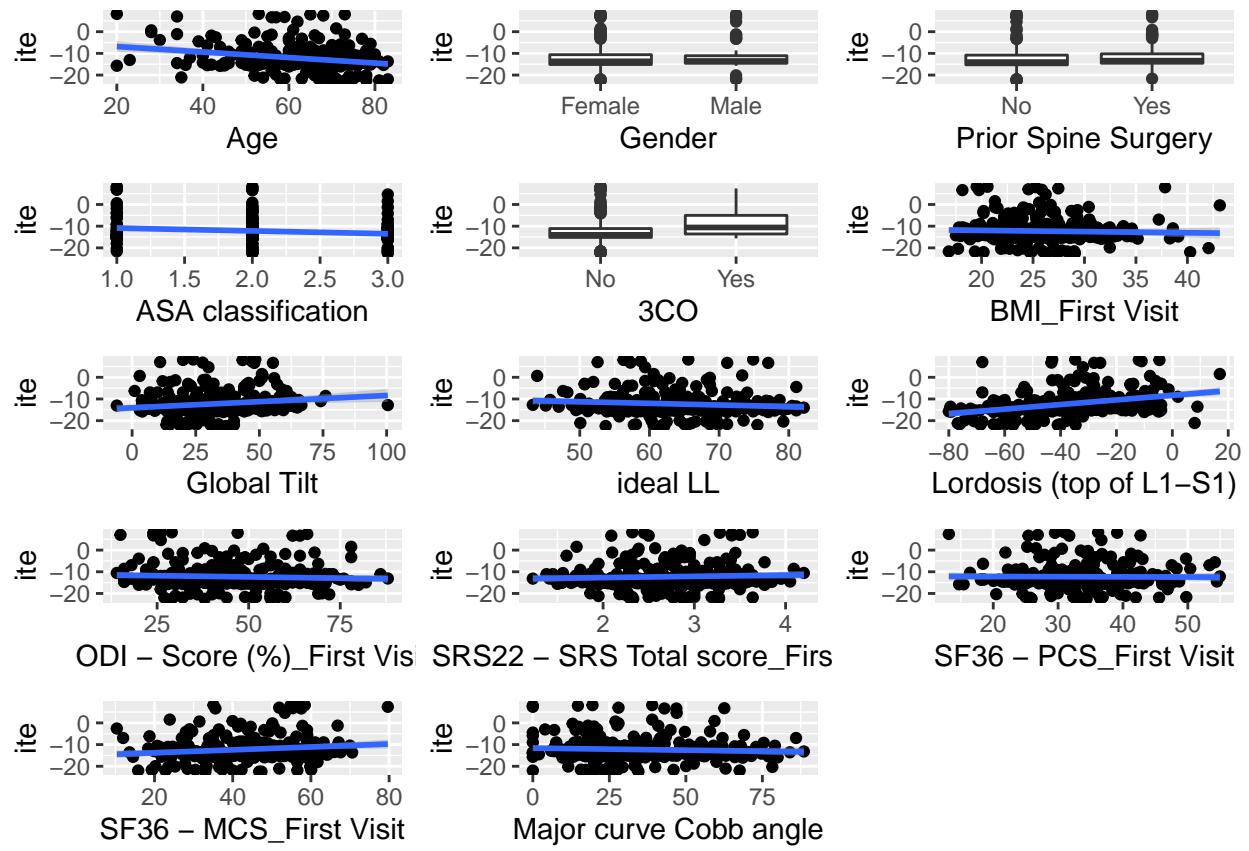
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity
1Y. Lordosis (top of L1–S1)



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 2Y. Lordosis (top of L1-S1)

Distribution:

0%	25%	50%	75%	100%
-65.5600	-22.5050	-8.1800	-0.2375	26.5200

Model Type Y: boosting

RMSE: 21.2563951521316

Params: nrounds: 50.0

max_depth: 1

eta: 0.4

gamma: 0.0

colsample_bytree: 0.8

min_child_weight: 1.0

subsample: 0.5

Model Type No: boosting

RMSE: 15.1285499102497

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 0.75

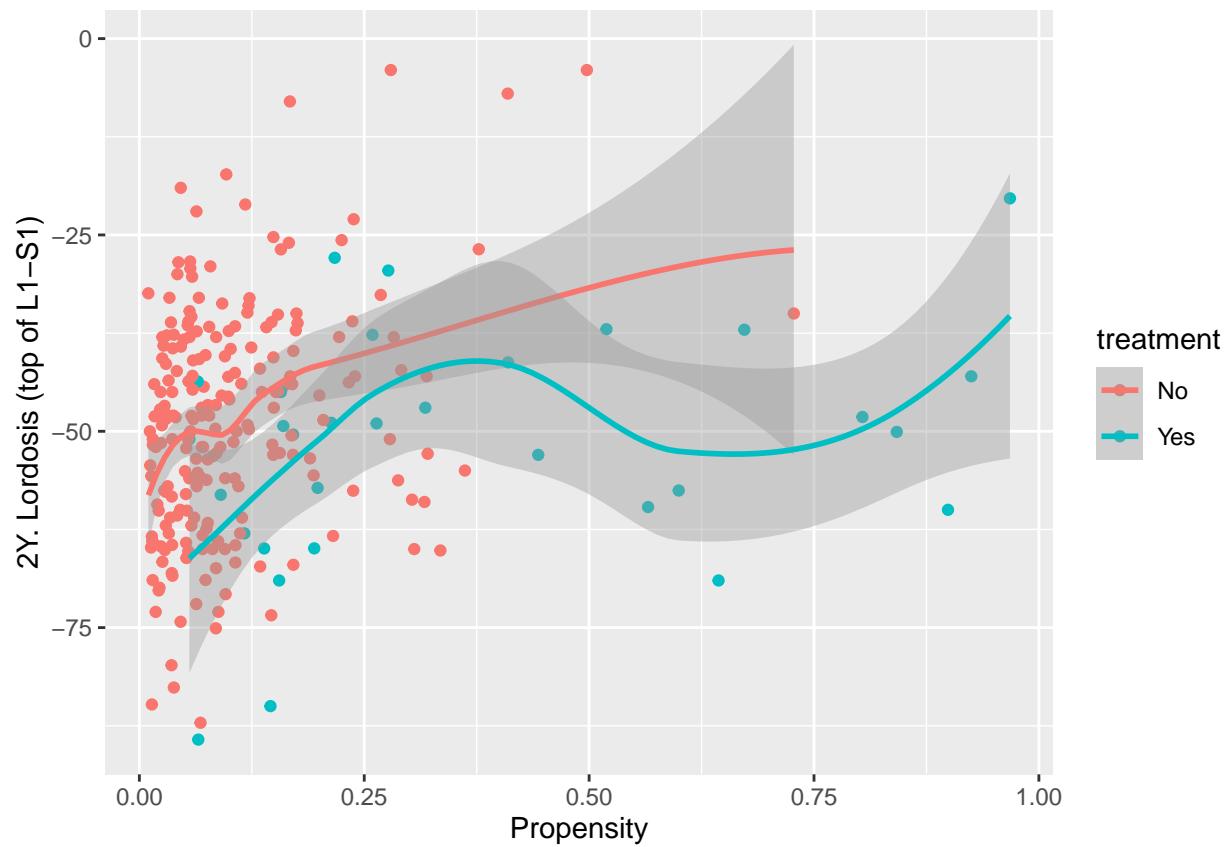
ATE (Yes-No): -11.353 (Std.Error: 4.981)

Trimmed ATE (Yes-No): -11.406 (Std.Error: 5.268)

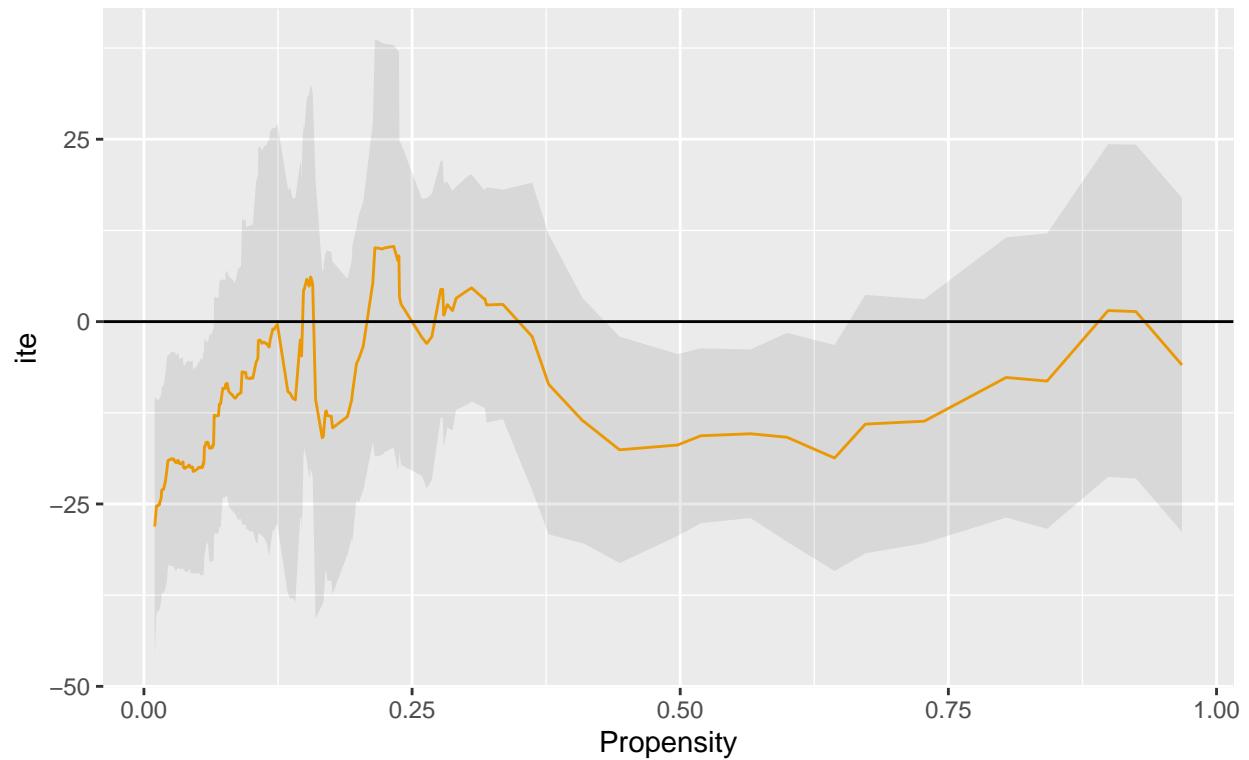
Upper ATE (Yes-No): -10.197 (Std.Error: 7.349)
Observational differences in treatment -2.919 (Yes-No)

```
treatment    outcome  
1:        Yes -51.83774  
2:       No -48.91858
```

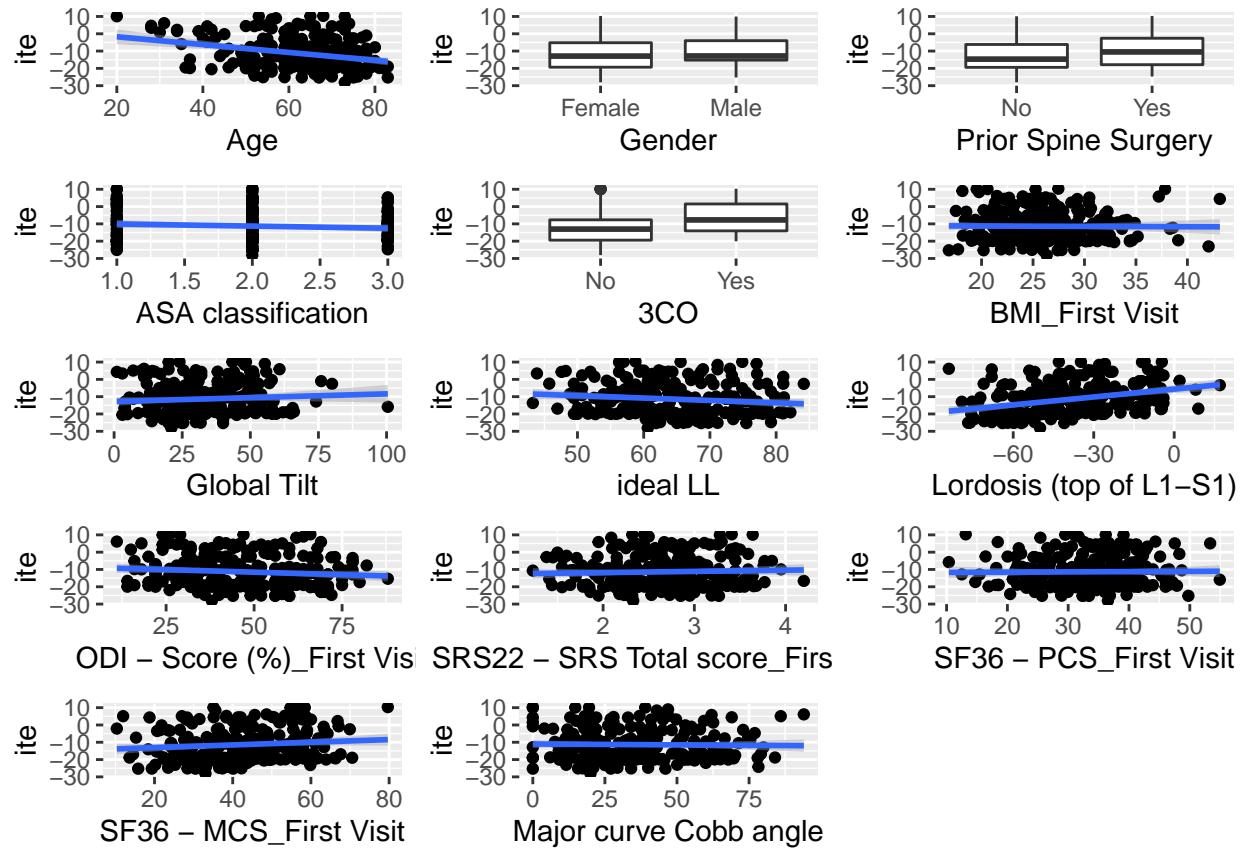
'geom_smooth()' using method = 'loess' and formula 'y ~ x'



Individual Treatment effect by propensity
2Y. Lordosis (top of L1–S1)



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 6W. LGap

Distribution:

0%	25%	50%	75%	100%
-64.6206	-24.0000	-9.1254	0.2107	27.3800

Model Type Y: boosting

RMSE: 18.3526654971434

Params: nrounds: 50.0

max_depth: 1

eta: 0.4

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 0.5

Model Type No: boosting

RMSE: 14.9535344712905

Params: nrounds: 50.0

max_depth: 1

eta: 0.4

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 0.625

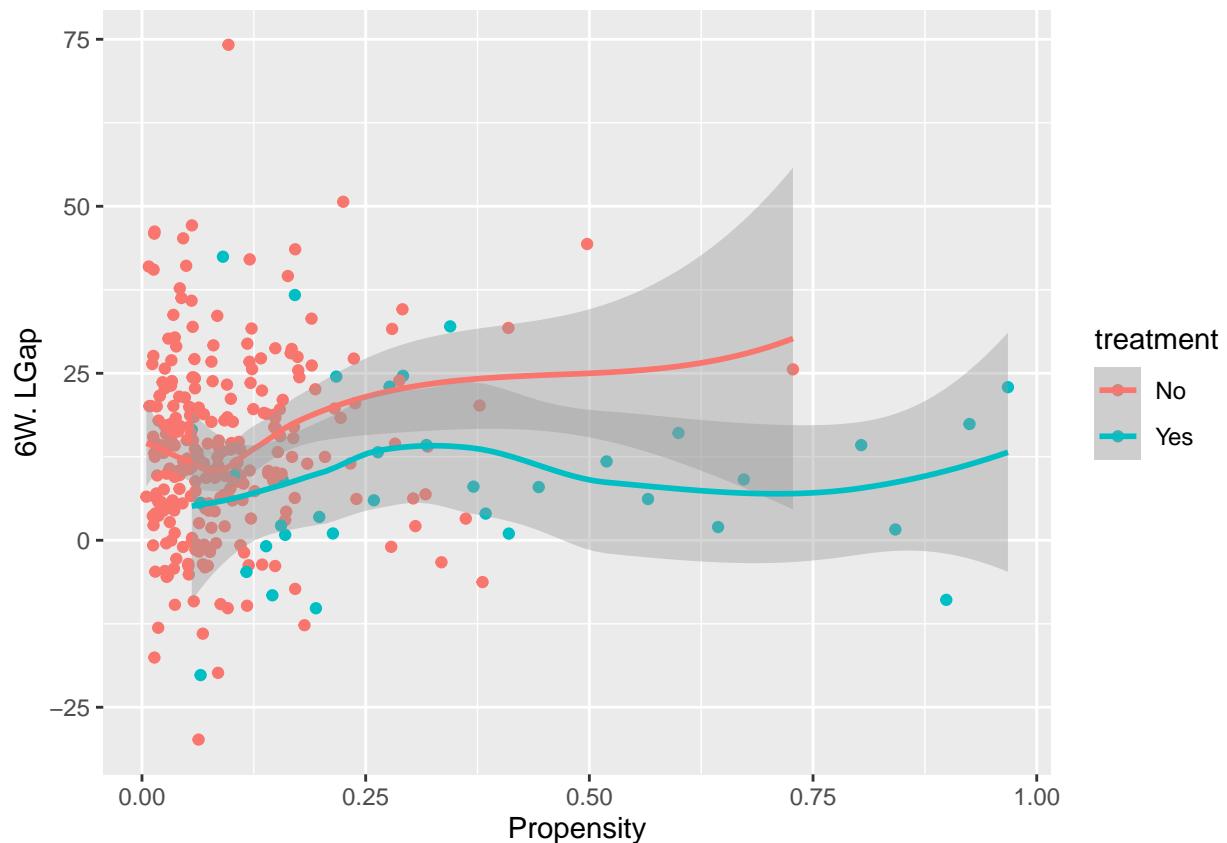
ATE (Yes-No): -7.31 (Std.Error: 7.161)

Trimmed ATE (Yes-No): -7.343 (Std.Error: 7.423)

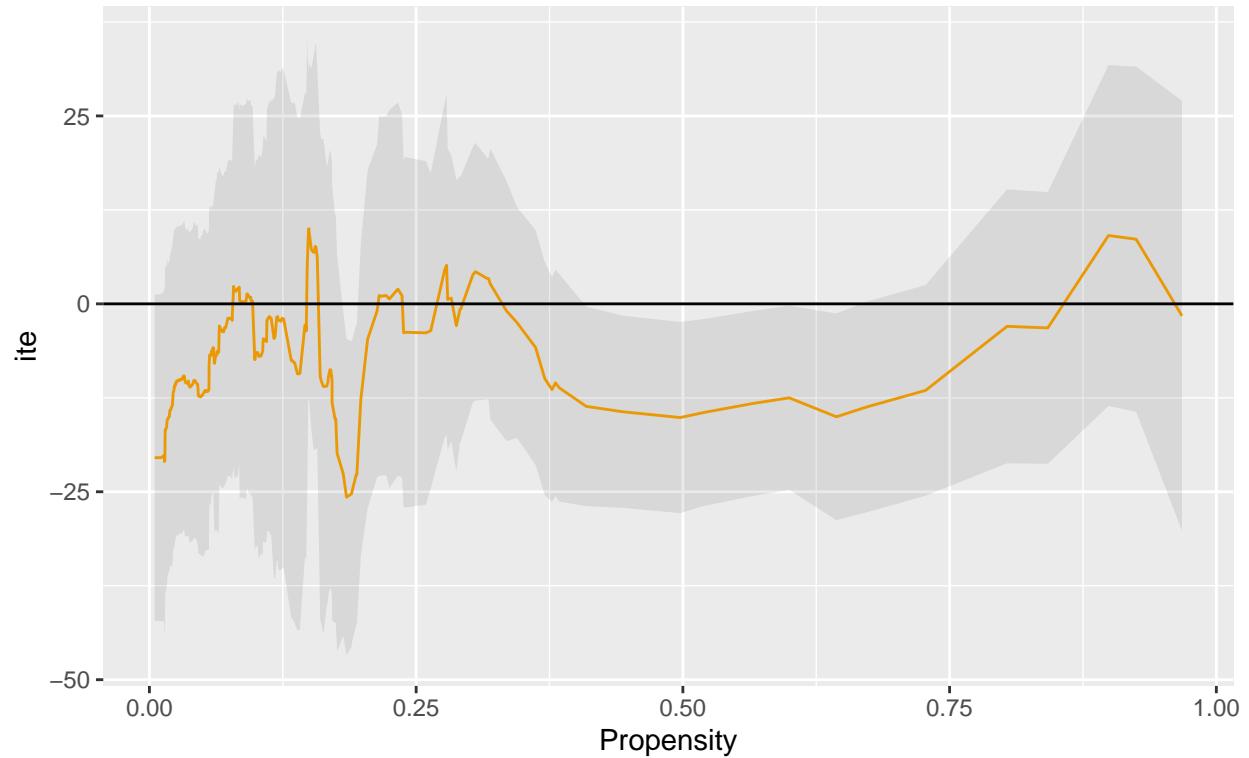
Upper ATE (Yes-No): -6.416 (Std.Error: 7.159)
Observational differences in treatment -4.195 (Yes-No)

```
treatment    outcome  
1:        Yes  9.285117  
2:       No 13.480212
```

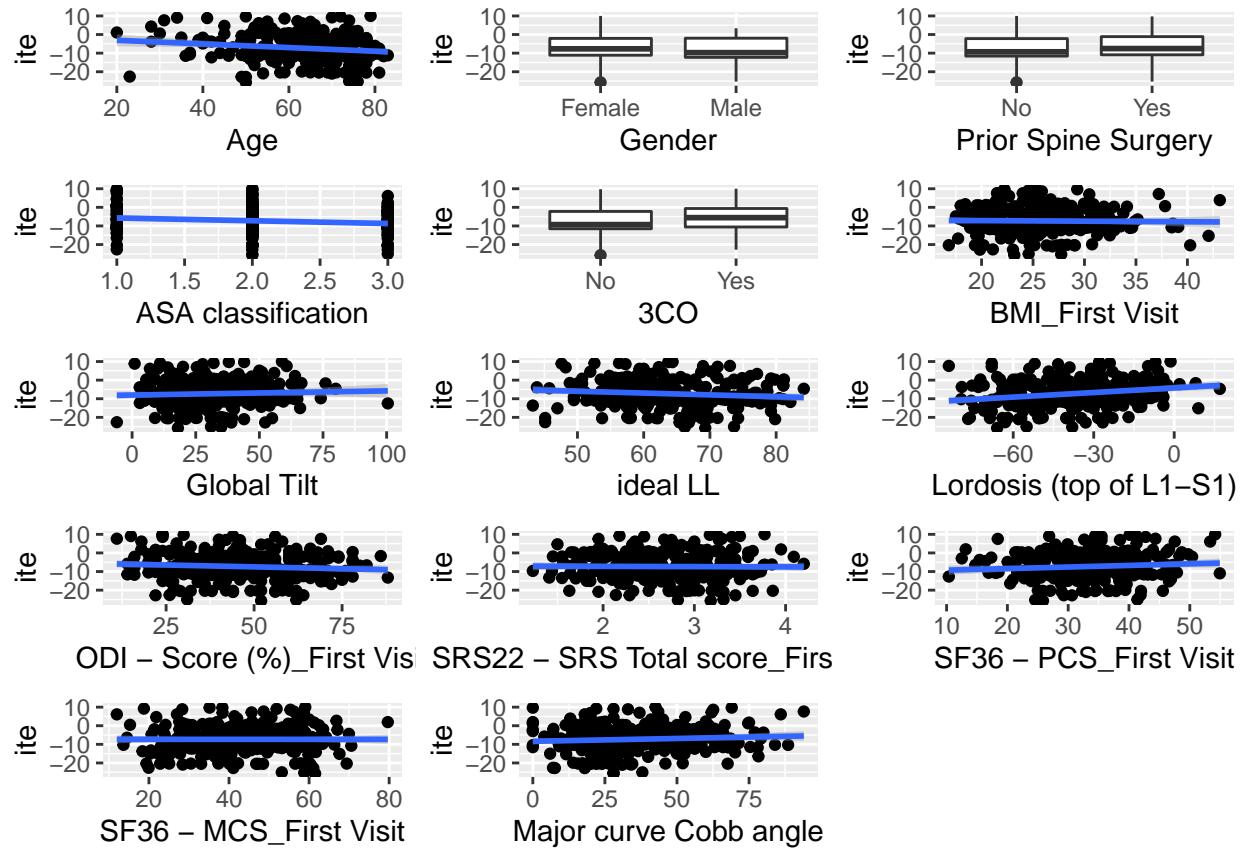
'geom_smooth()' using method = 'loess' and formula 'y ~ x'



Individual Treatment effect by propensity 6W. LGap



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 1Y. LGap

Distribution:

0%	25%	50%	75%	100%
-67.72420	-24.42425	-6.89620	0.58000	22.08000

Model Type Y: boosting

RMSE: 21.6365853951962

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.8

min_child_weight: 1.0

subsample: 0.5

Model Type No: boosting

RMSE: 15.1536810436212

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

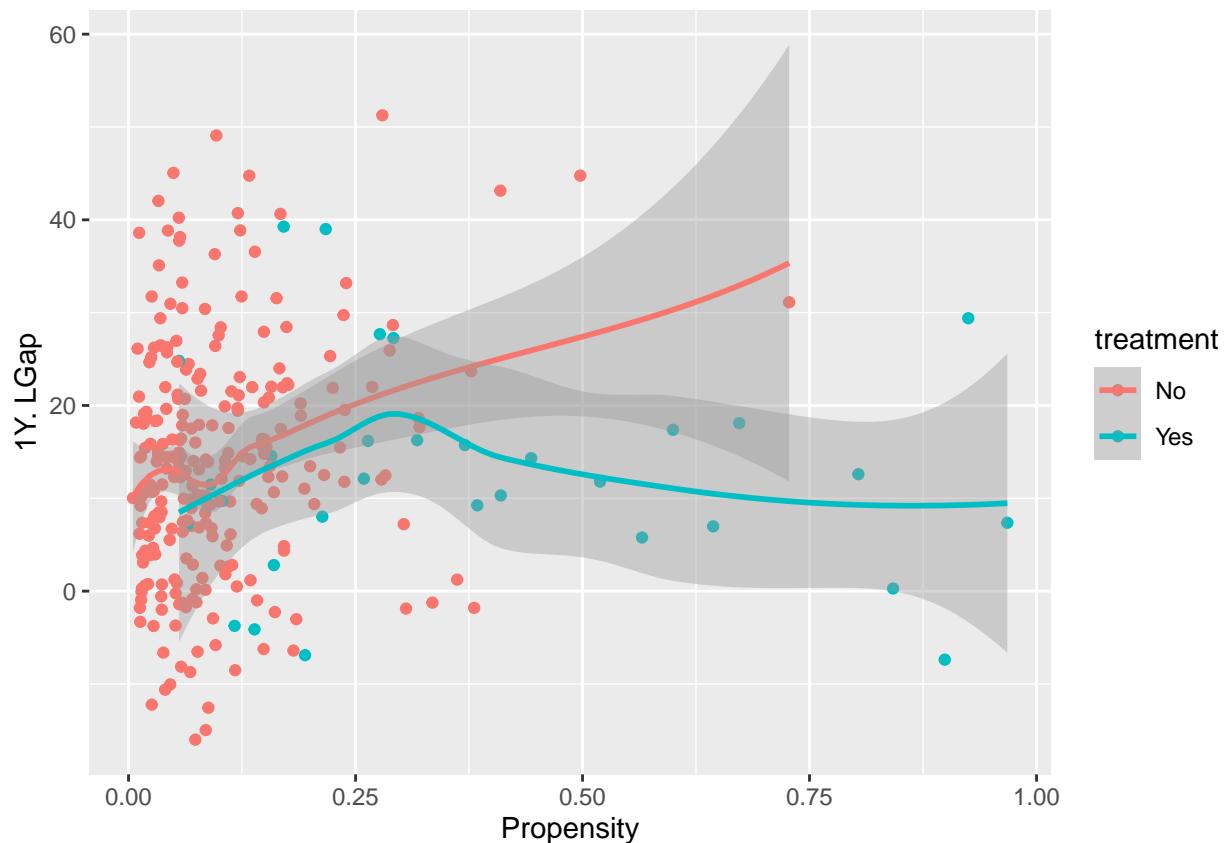
ATE (Yes-No): -12.14 (Std.Error: 6.367)

Trimmed ATE (Yes-No): -12.209 (Std.Error: 6.571)

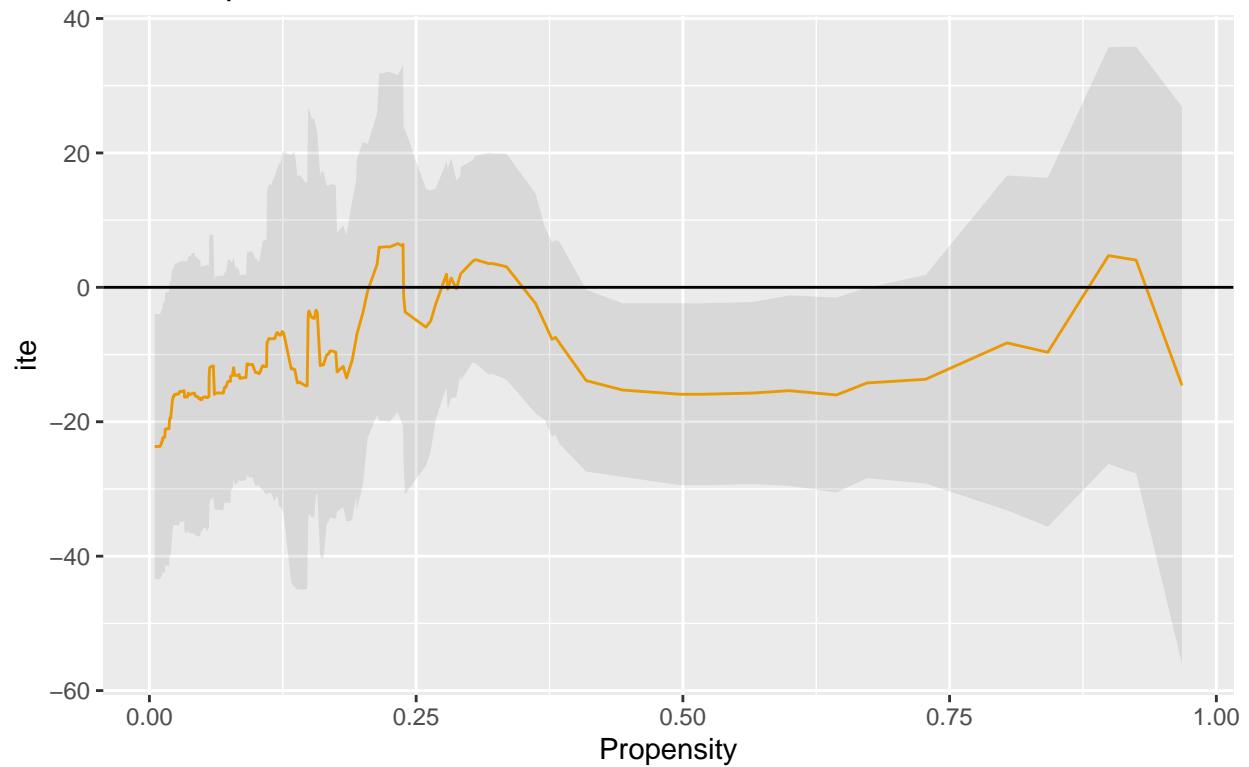
Upper ATE (Yes-No): -10.426 (Std.Error: 8.515)
Observational differences in treatment -1.258 (Yes-No)

```
treatment    outcome  
1:          Yes 12.69223  
2:         No 13.94980
```

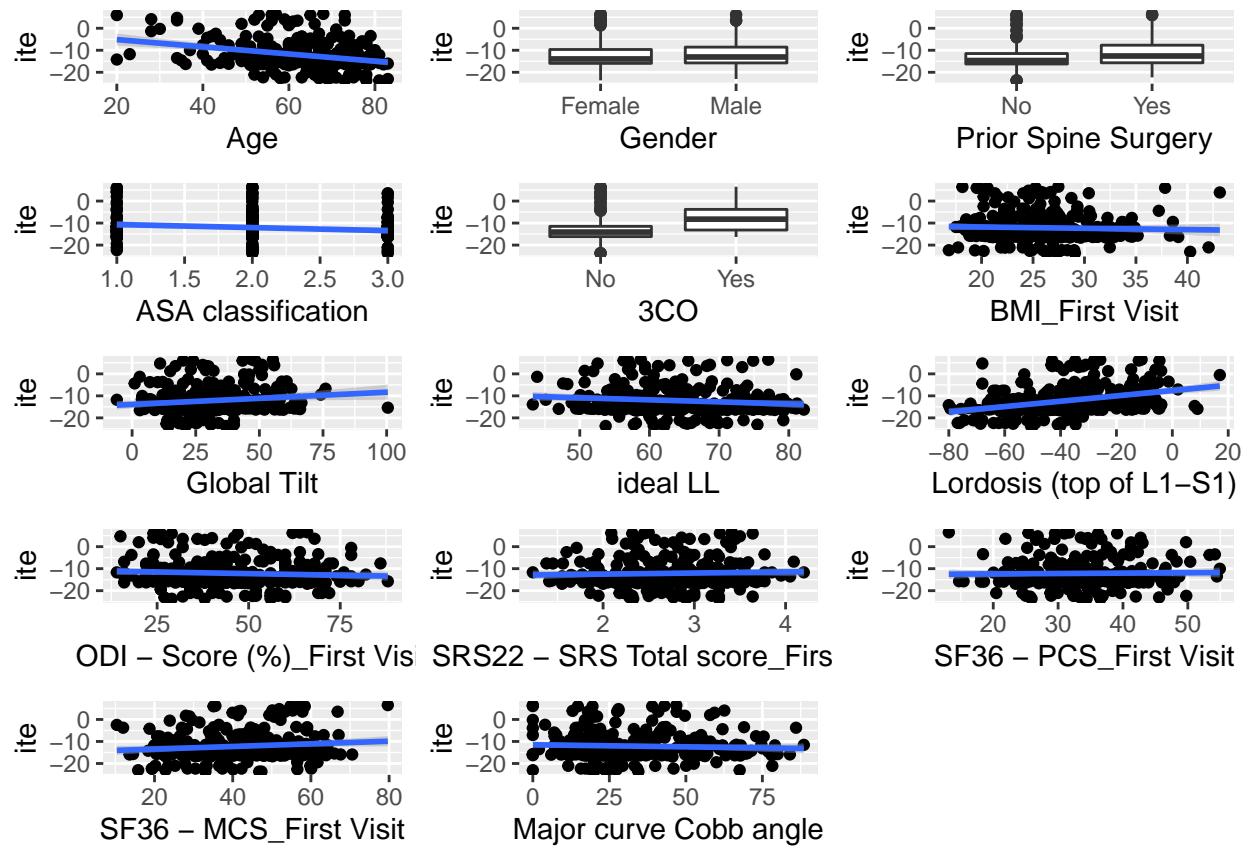
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity 1Y. LGap



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 2Y. LGap

Distribution:

0%	25%	50%	75%	100%
-65.65180	-22.33365	-8.57860	-0.58385	25.09440

Model Type Y: boosting

RMSE: 18.8993207268262

Params: nrounds: 50.0

max_depth: 1

eta: 0.4

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 0.625

Model Type No: boosting

RMSE: 14.5627889708403

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

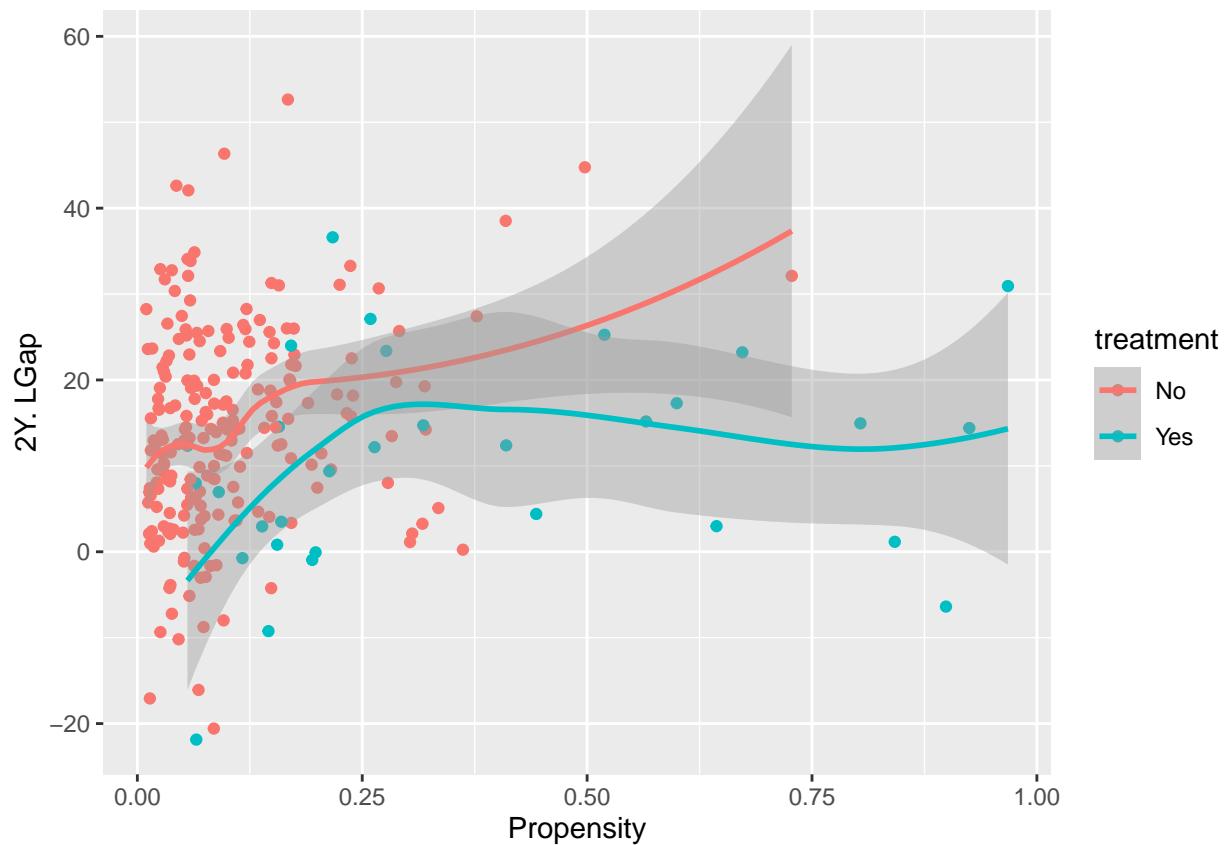
ATE (Yes-No): -10.696 (Std.Error: 4.271)

Trimmed ATE (Yes-No): -10.699 (Std.Error: 4.466)

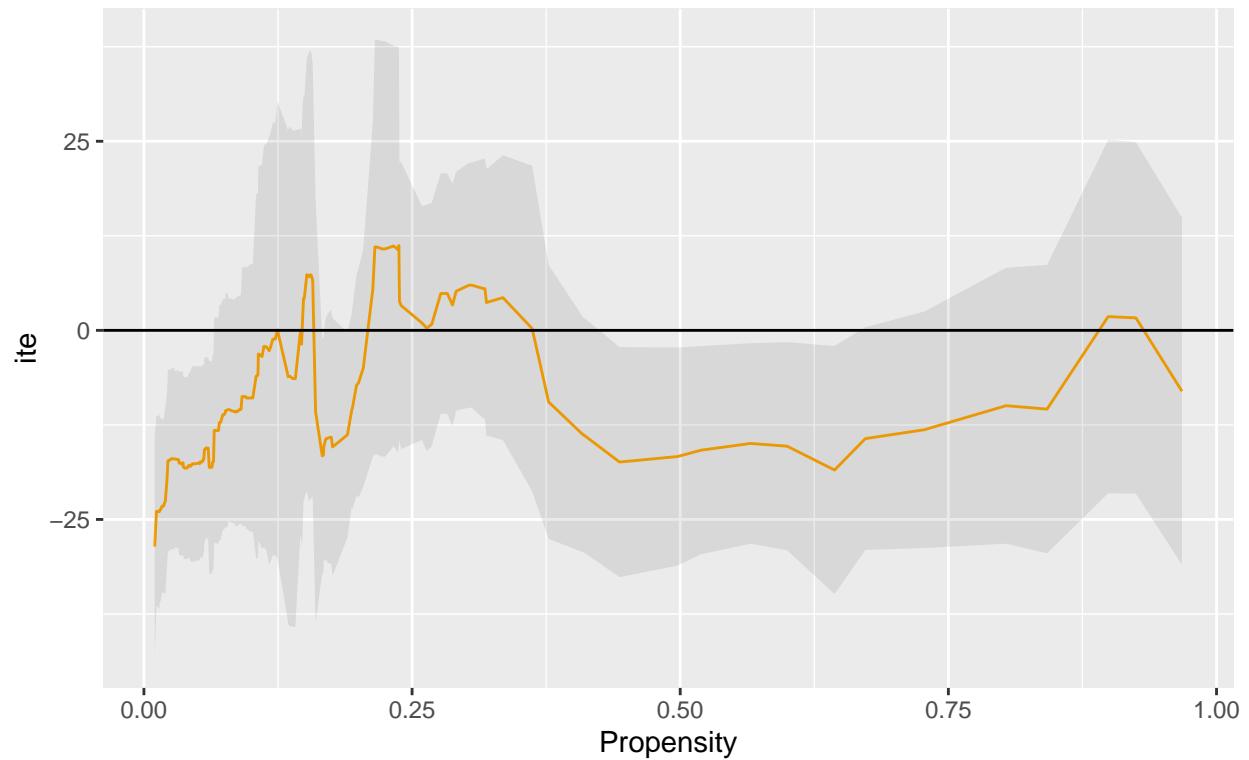
Upper ATE (Yes-No): -10.636 (Std.Error: 7.261)
Observational differences in treatment -3.781 (Yes-No)

```
treatment outcome  
1: Yes 10.30224  
2: No 14.08358
```

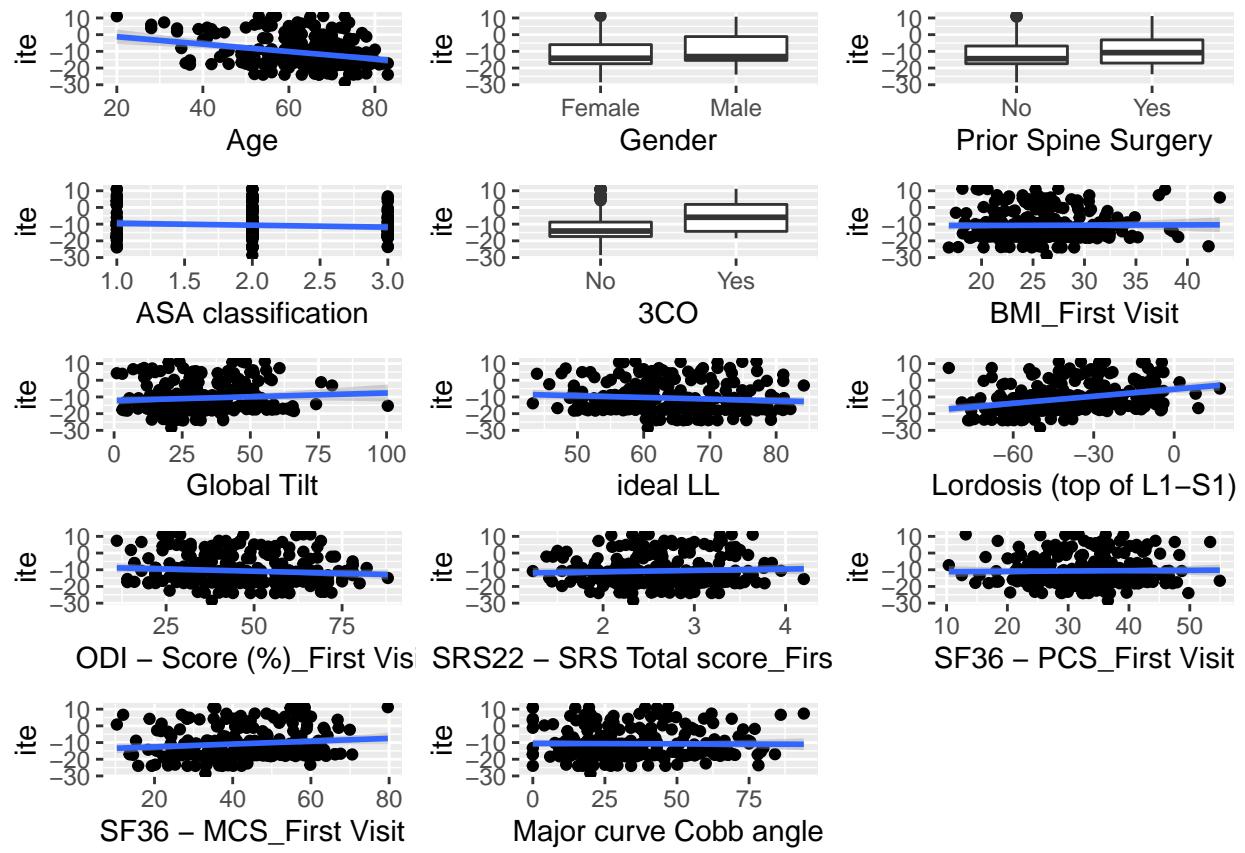
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity 2Y. LGap



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 6W. Pelvic Tilt

Distribution:

0%	25%	50%	75%	100%
-36.4100	-8.2575	-2.0000	2.0000	14.4200

Model Type Y: boosting

RMSE: 11.2706603516638

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.8

min_child_weight: 1.0

subsample: 0.875

Model Type No: boosting

RMSE: 7.66137638243425

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 0.5

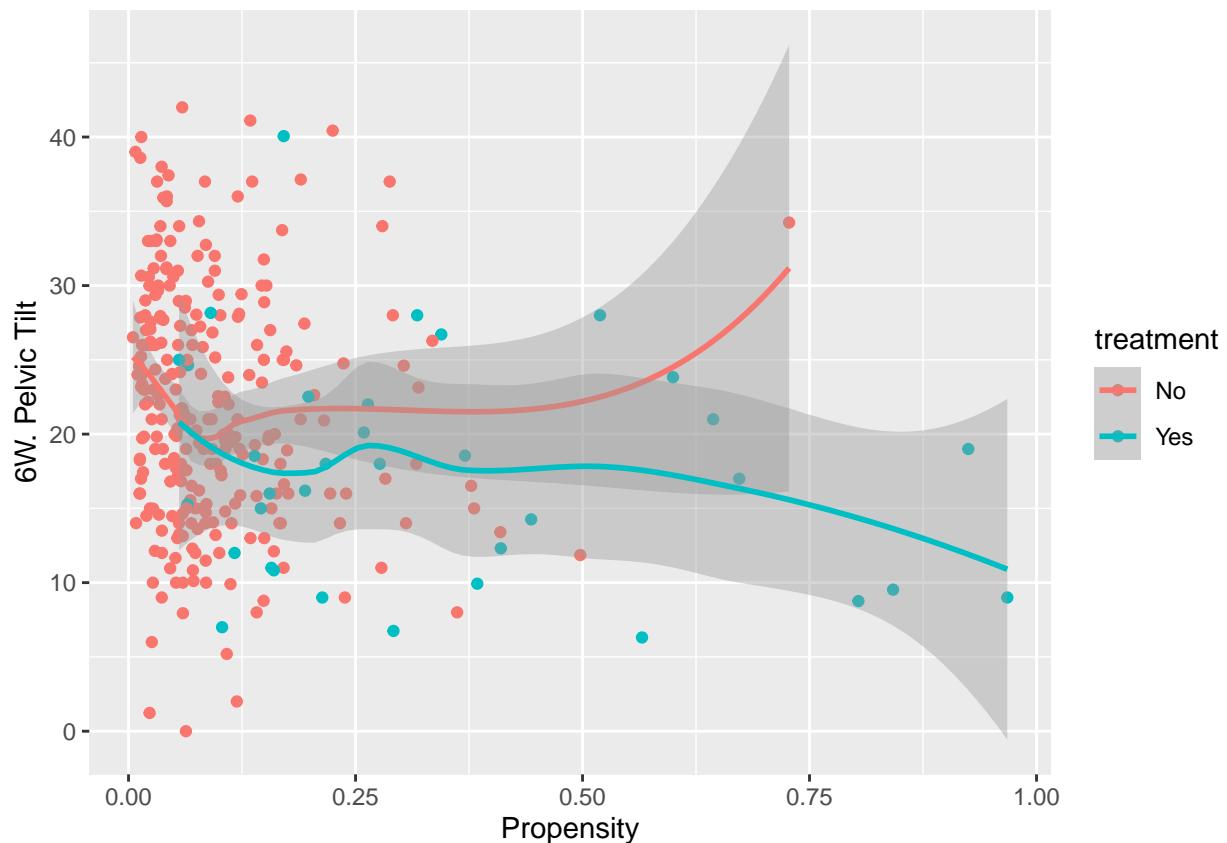
ATE (Yes-No): -6.969 (Std.Error: 3.244)

Trimmed ATE (Yes-No): -6.93 (Std.Error: 3.34)

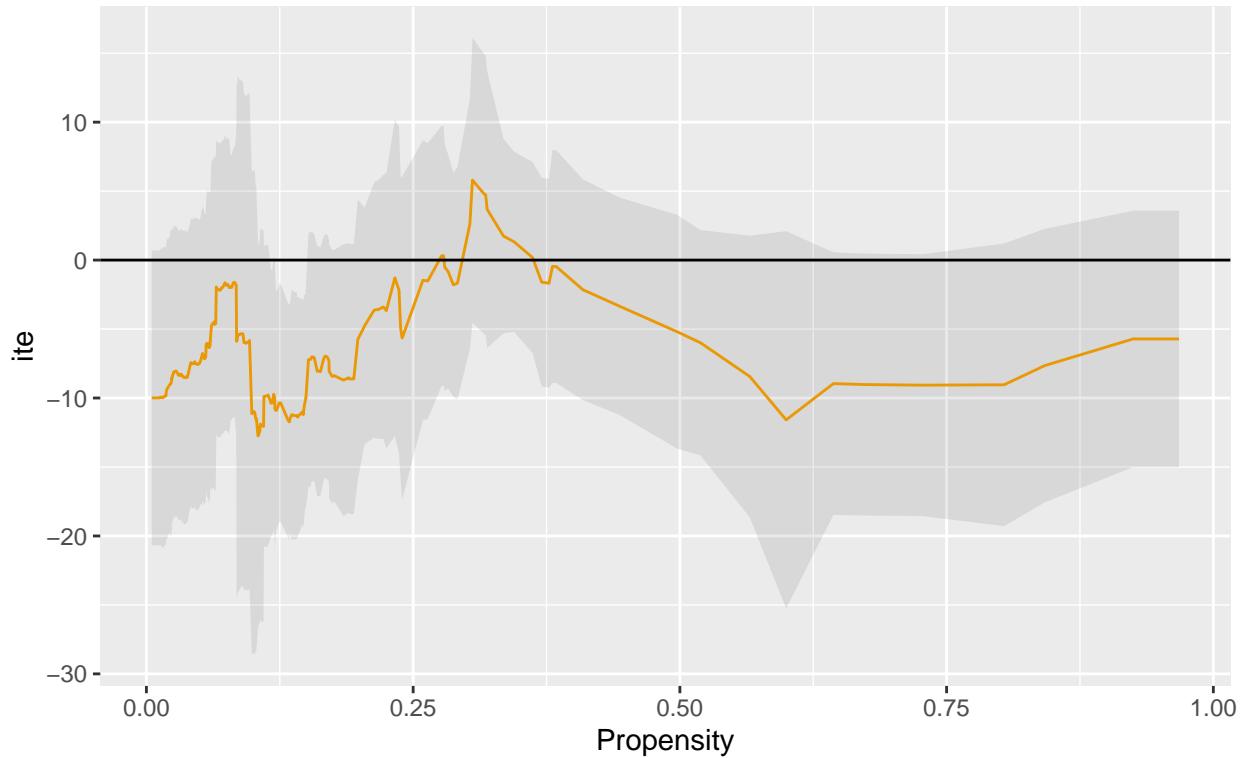
Upper ATE (Yes-No): -8.119 (Std.Error: 4.289)
Observational differences in treatment -4.452 (Yes-No)

```
treatment outcome  
1:      Yes 17.37857  
2:     No 21.83019
```

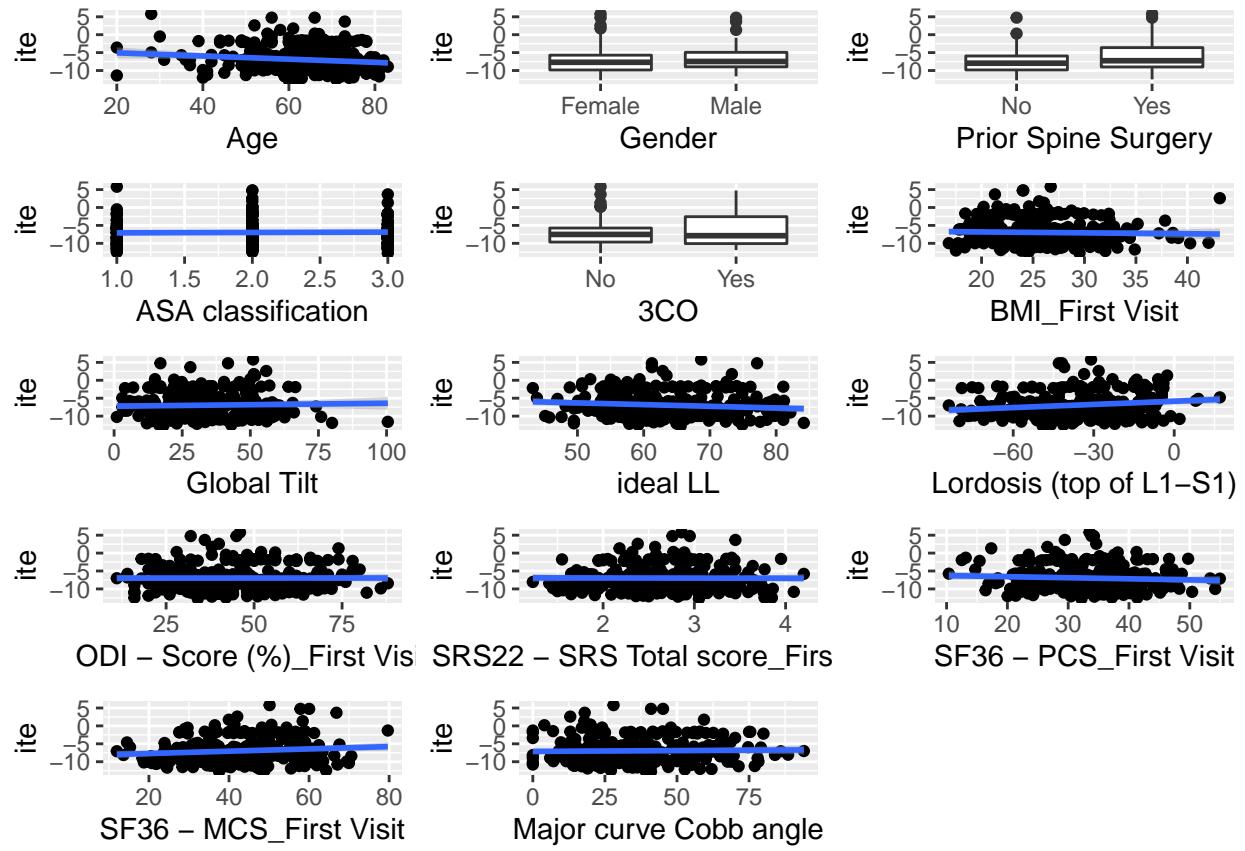
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity 6W. Pelvic Tilt



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 1Y. Pelvic Tilt

Distribution:

0%	25%	50%	75%	100%
-26.6200	-6.8975	-2.0150	1.3925	23.0000

Model Type Y: boosting

RMSE: 8.6934404679684

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

Model Type No: boosting

RMSE: 6.88642283168948

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 1.0

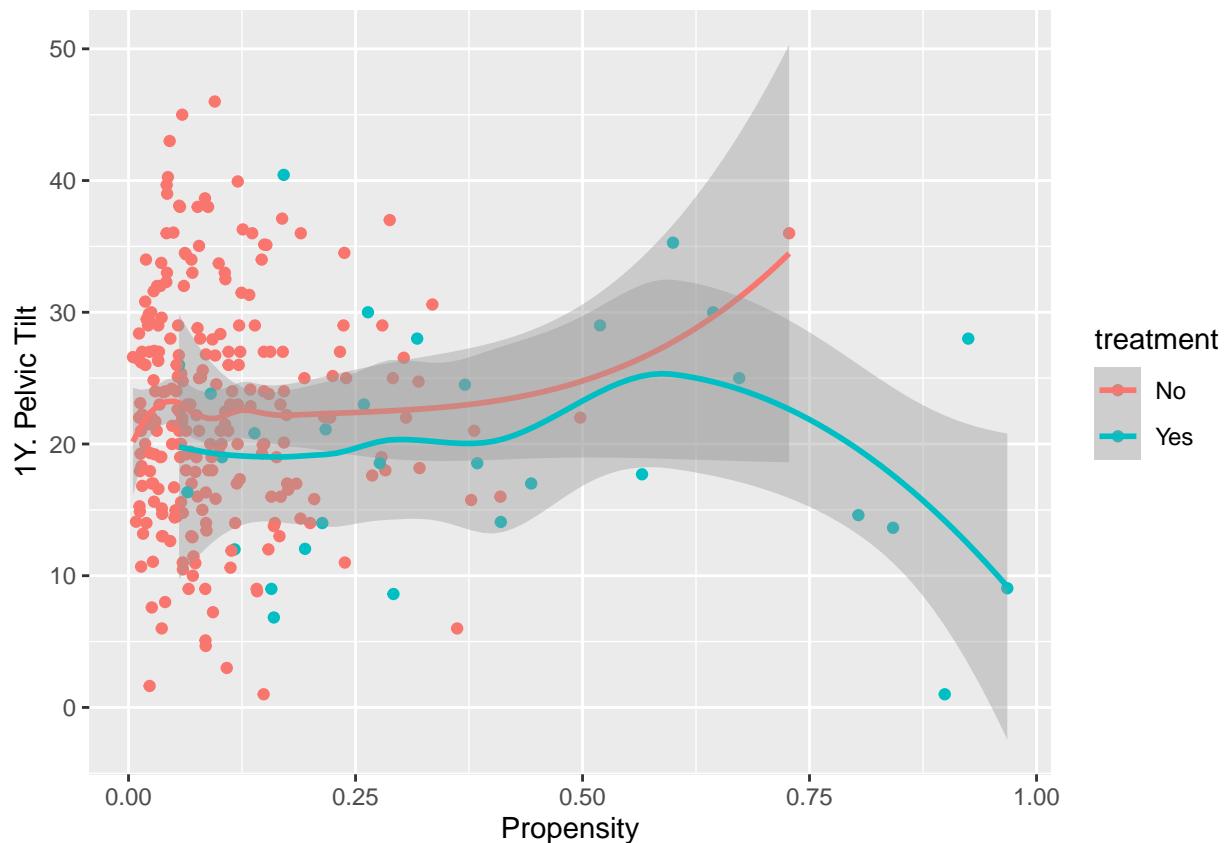
ATE (Yes-No): -9.678 (Std.Error: 2.235)

Trimmed ATE (Yes-No): -9.919 (Std.Error: 2.353)

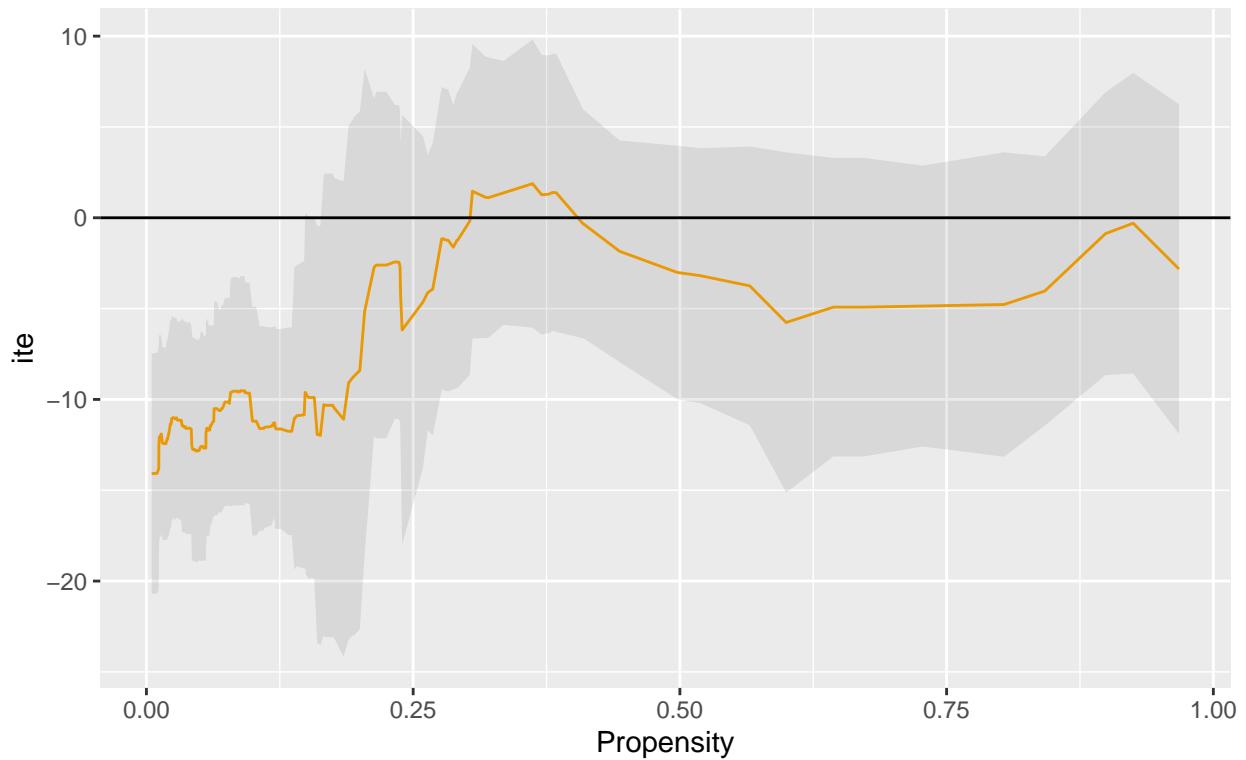
Upper ATE (Yes-No): -3.655 (Std.Error: 3.062)
Observational differences in treatment -2.932 (Yes-No)

```
treatment outcome  
1: Yes 19.57871  
2: No 22.51027
```

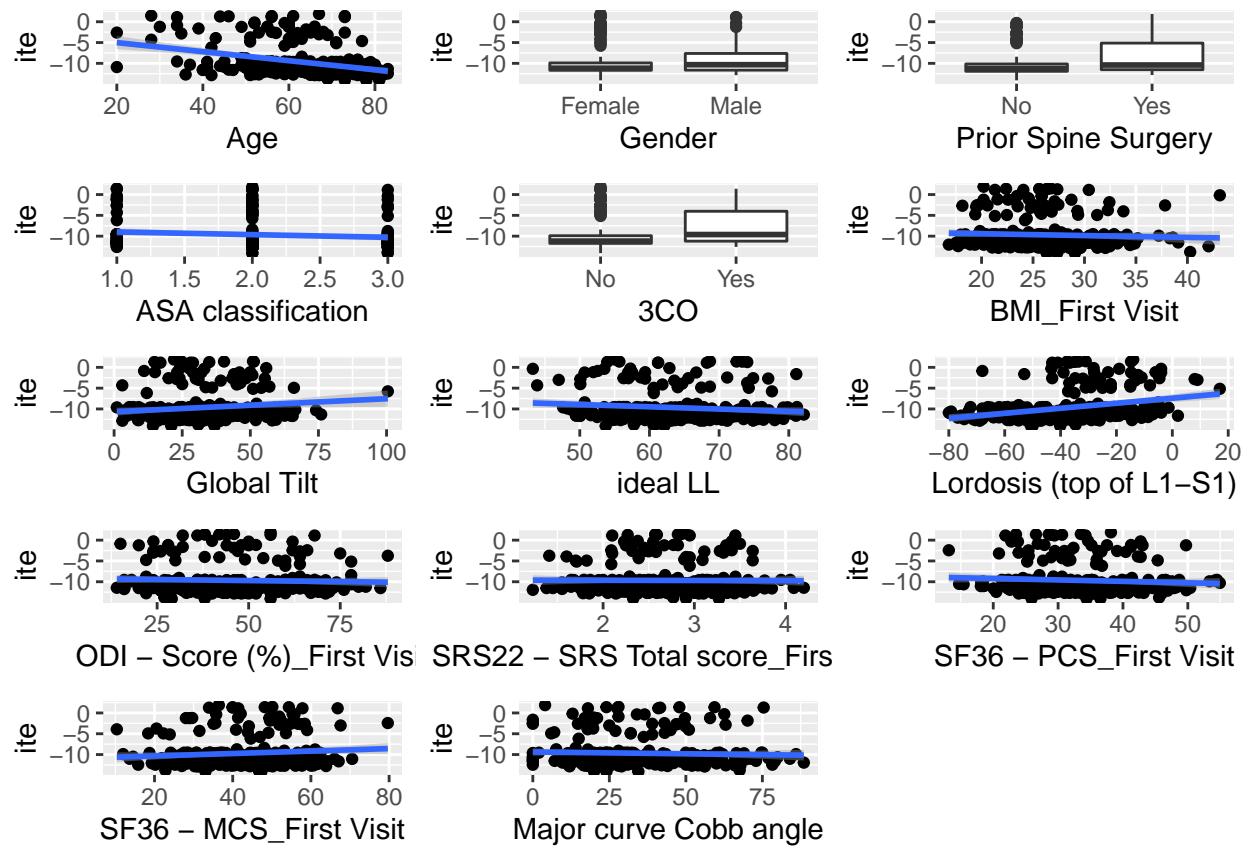
```
'geom_smooth()' using method = 'loess' and formula 'y ~ x'
```



Individual Treatment effect by propensity 1Y. Pelvic Tilt



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```



Outcome: 2Y. Pelvic Tilt

Distribution:

0%	25%	50%	75%	100%
-25.630	-6.000	-1.440	2.595	12.500

Model Type Y: boosting

RMSE: 9.02784838358479

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.6

min_child_weight: 1.0

subsample: 0.75

Model Type No: boosting

RMSE: 6.66635150312761

Params: nrounds: 50.0

max_depth: 1

eta: 0.3

gamma: 0.0

colsample_bytree: 0.8

min_child_weight: 1.0

subsample: 0.5

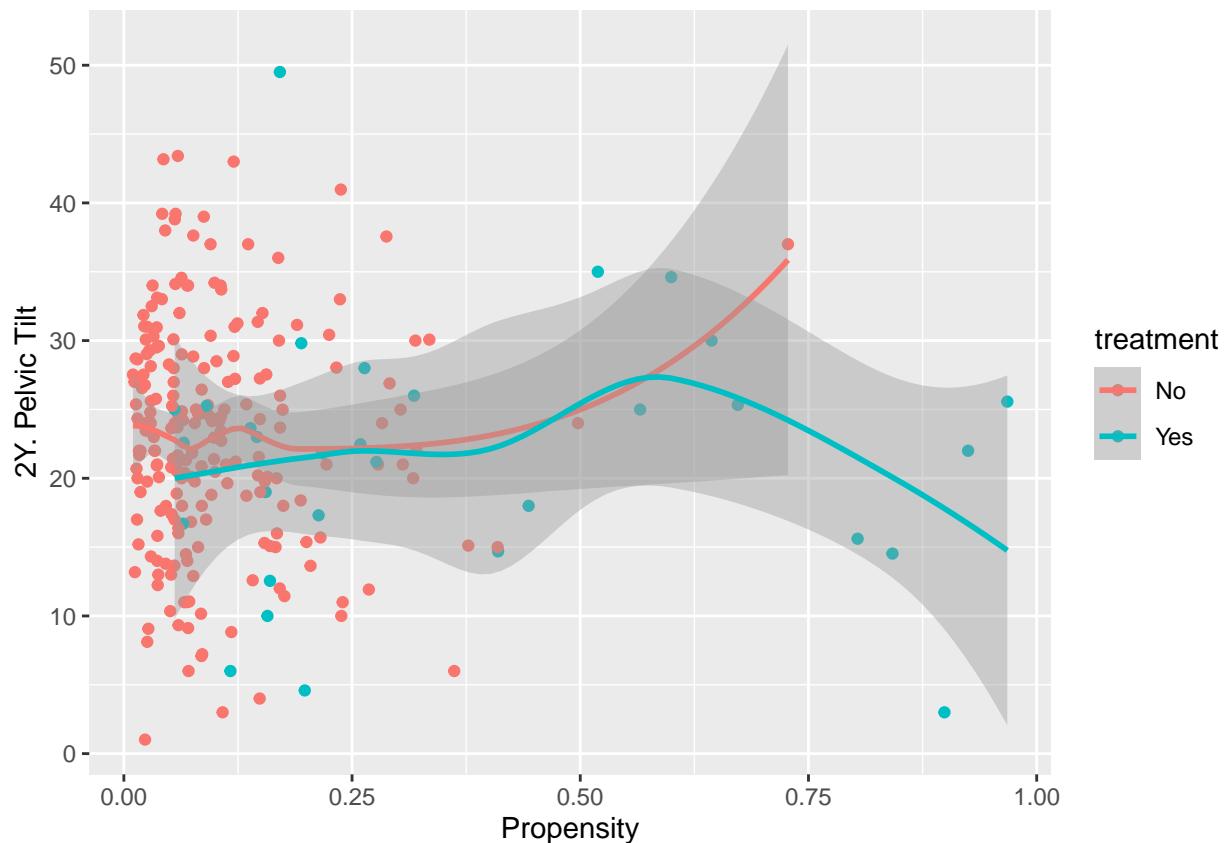
ATE (Yes-No): -6 (Std.Error: 2.376)

Trimmed ATE (Yes-No): -6.202 (Std.Error: 2.465)

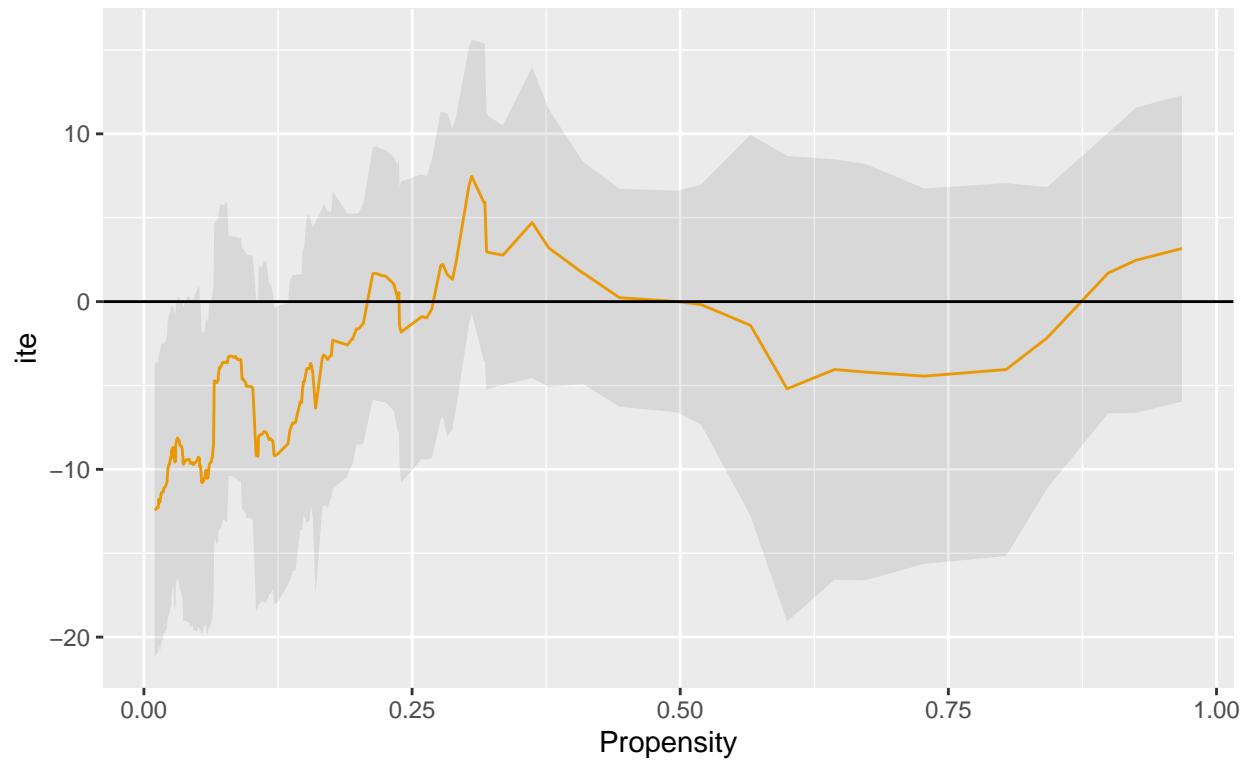
Upper ATE (Yes-No): -1.67 (Std.Error: 4.321)
Observational differences in treatment -1.502 (Yes-No)

treatment outcome
1: Yes 21.54000
2: No 23.04153

'geom_smooth()' using method = 'loess' and formula 'y ~ x'



Individual Treatment effect by propensity 2Y. Pelvic Tilt



```
'geom_smooth()' using formula 'y ~ x'  
'geom_smooth()' using formula 'y ~ x'
```

