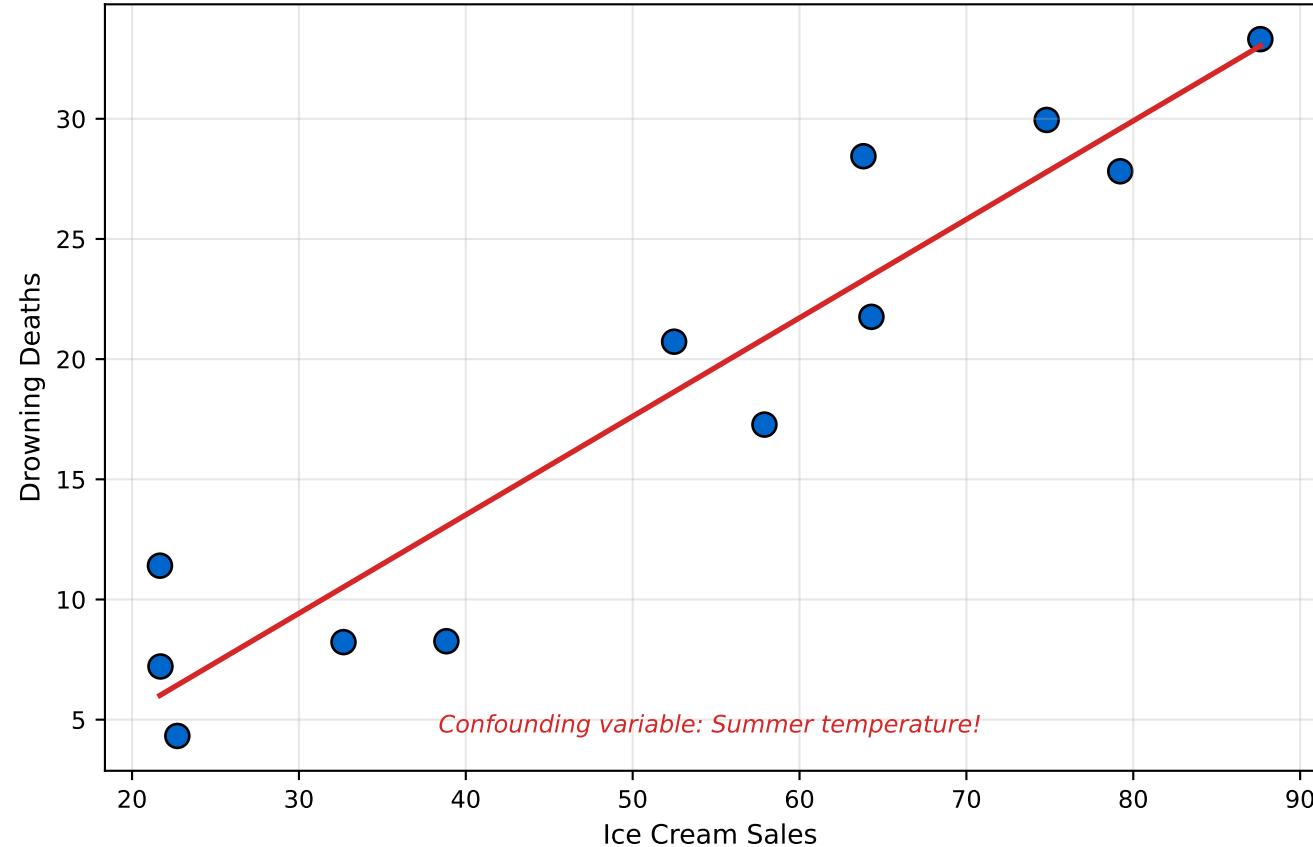
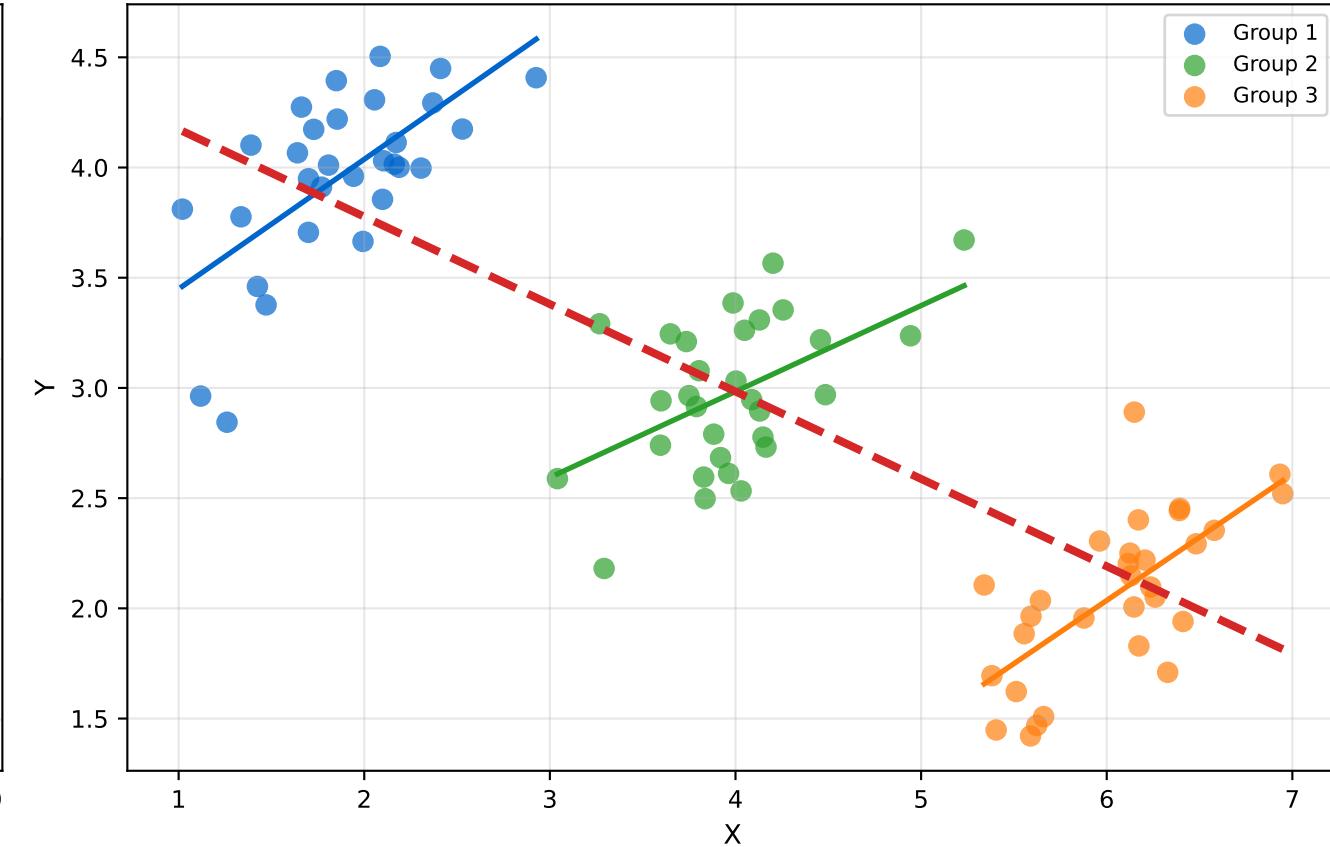


Spurious Correlations: When r Lies

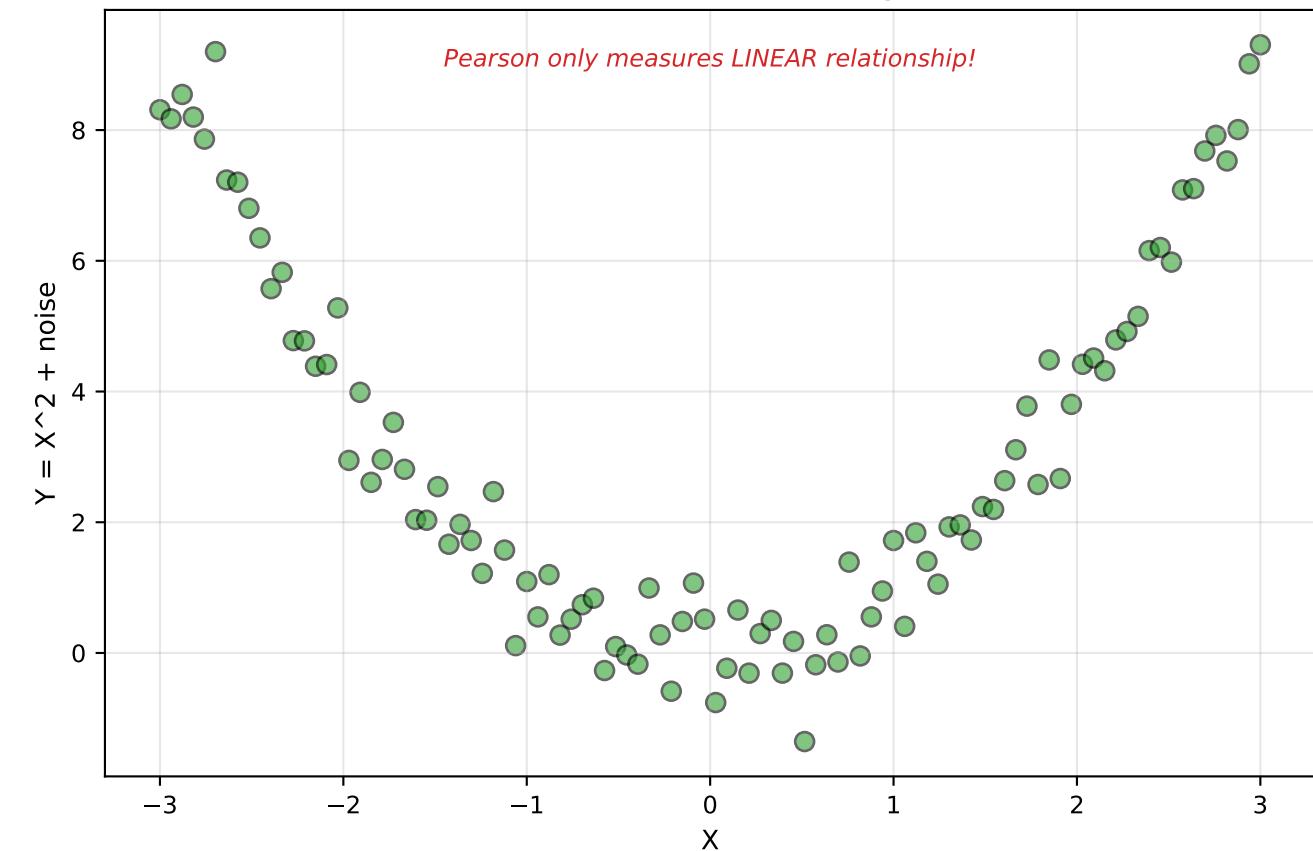
Ice Cream vs Drownings ($r = 0.95$)



Simpson's Paradox (Overall $r = -0.81$)



Non-linearity: $r = -0.01$ (but clearly related!)



Correlation Pitfalls

- Confounding Variables:** Both X and Y caused by hidden Z
- Simpson's Paradox:** Trend reverses when data is grouped
- Non-linearity:** $r = 0$ does not mean no relationship
- Outliers:** Single point can dominate correlation
- Coincidence:** Random correlations in large datasets

Always visualize your data before trusting correlation!