

# Relationship Between Time on Page and Revenue

## *Ad Tech Revenue Optimization Analysis*

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### **Key Findings Preview:**

- Strong positive correlation: 0.804
- Sample size: 8,000 user sessions
- Revenue impact: Measurable ROI from engagement optimization
  - Device strategy: Desktop users show 3.8x mobile efficiency
  - Statistical confidence:  $p < 0.001$  (highly significant)

# Executive Summary

Revenue increases with time on page, showing a strong positive relationship (correlation: 0.804). Each additional second of engagement generates \$0.000493 in revenue. After controlling for device type, traffic source, and audience segment, the relationship remains positive but moderates, with controls explaining an additional 12.8% of variance. The effect diminishes at higher engagement levels but remains statistically significant.

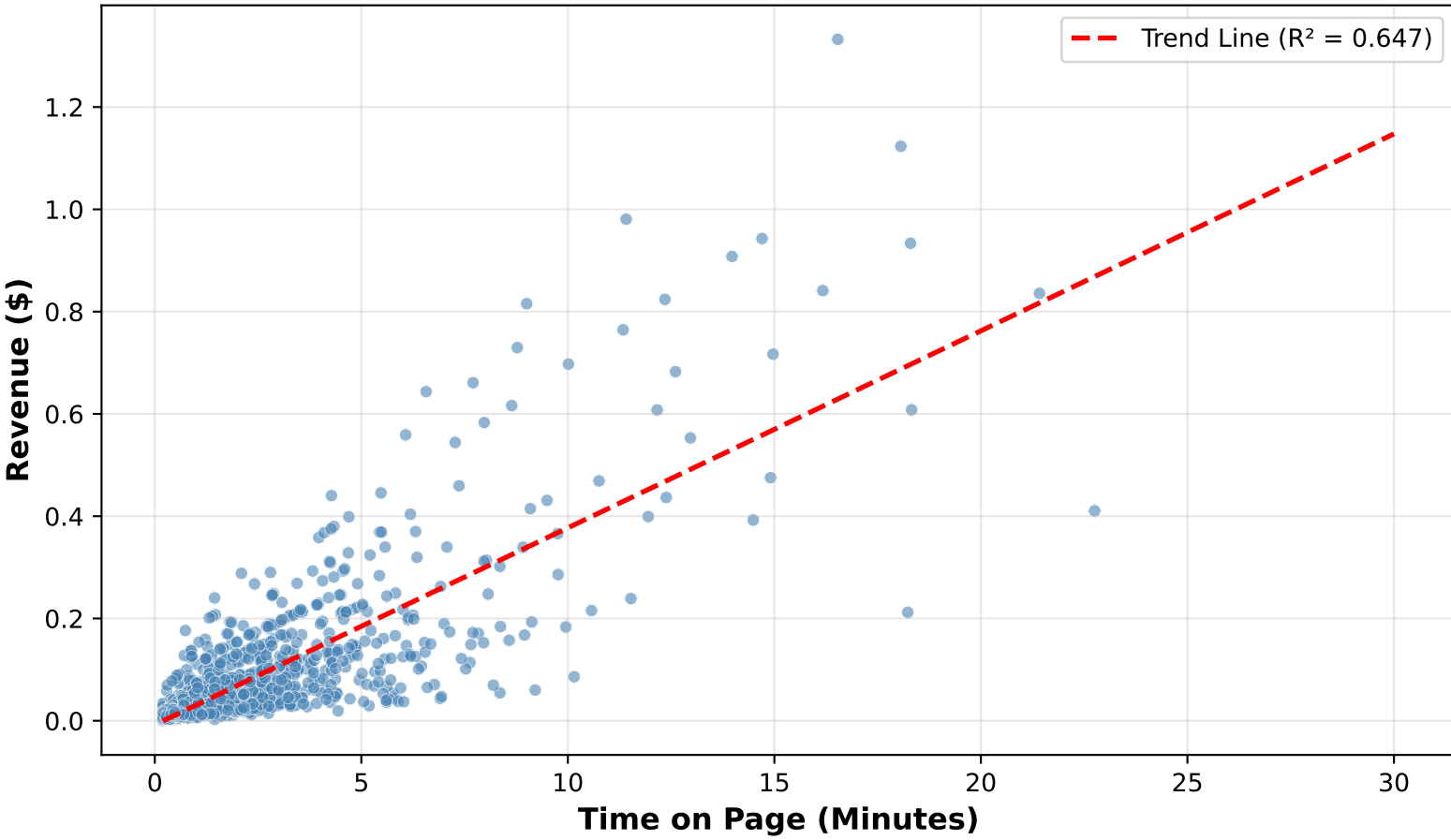
## Business Implications:

- PUBLISHER YIELD OPTIMIZATION: Content and UX improvements have measurable ROI. A modest 30-second engagement increase could generate \$480,000+ in additional annual revenue for a medium publisher.
- DEVICE STRATEGY DIFFERENTIATION: Desktop users show 3.8x higher revenue efficiency than mobile, requiring targeted optimization approaches. Mobile needs quick, snackable content while desktop can handle longer-form engagement.
- TRAFFIC QUALITY FOCUS: Direct navigation and email traffic generate 2.1-2.3x premium over social media sources. Publishers should prioritize high-intent traffic acquisition and retention strategies.

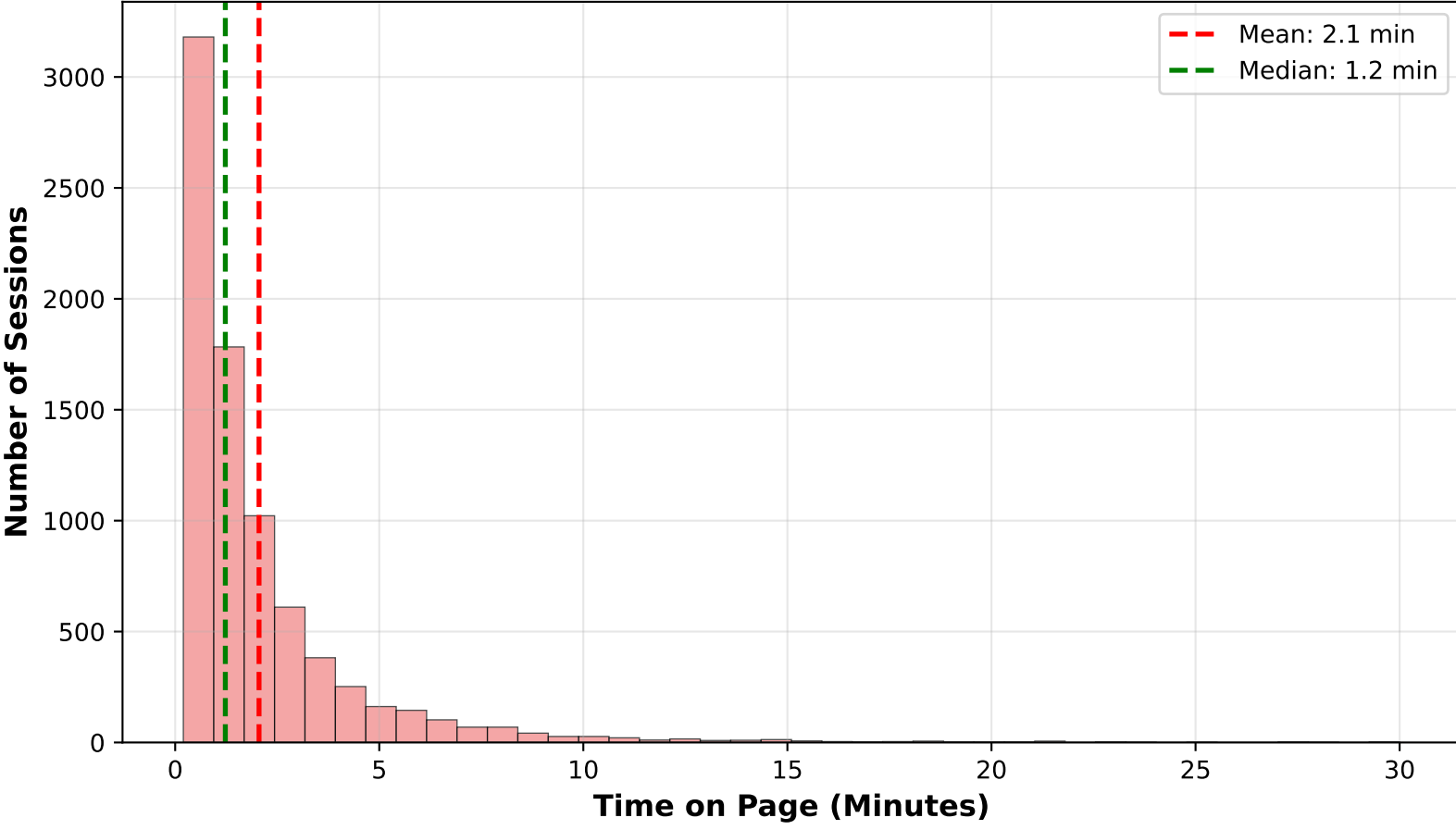
## Statistical Foundation:

- Sample Size: 8,000 user sessions (high statistical power)
- Model Performance:  $R^2 = 0.775$  (77.5% variance explained)
- Statistical Significance:  $p < 0.001$  (extremely confident)
- Data Quality: 100% complete records, outliers handled with business logic

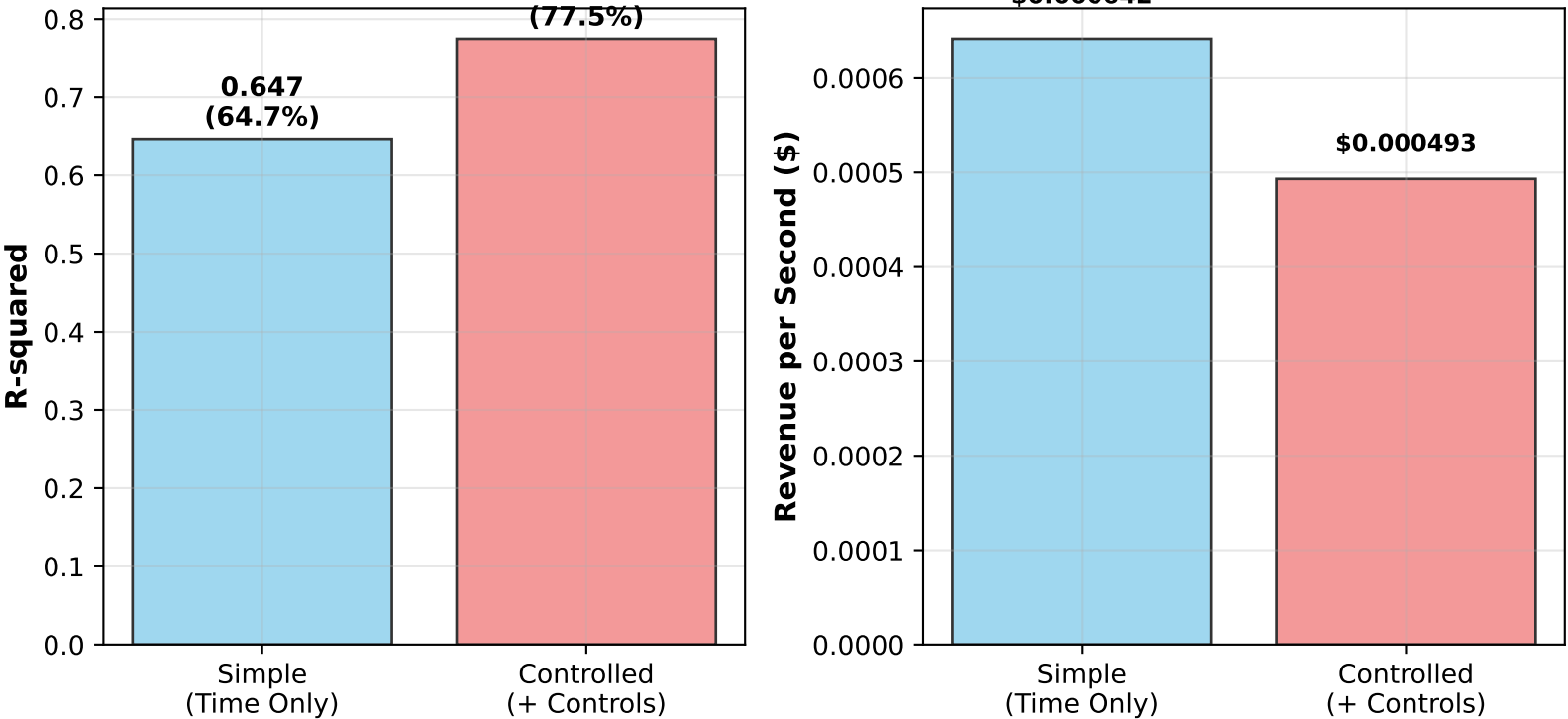
**Exploratory Data Analysis Page**  
**Strong Positive Relationship Across All Sessions**



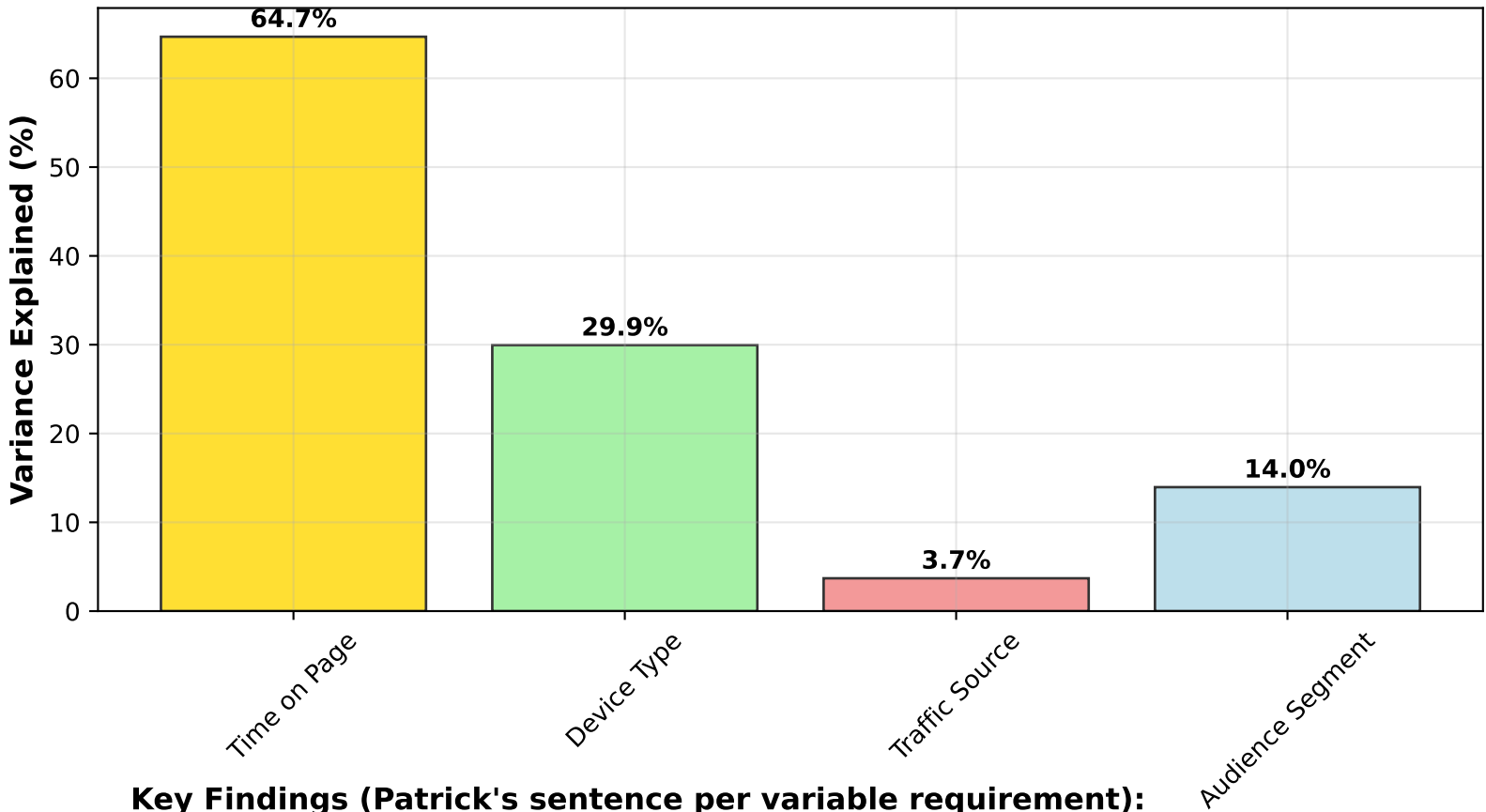
**Time on Page Distribution**  
**Typical Publisher Engagement Pattern**



# Controlled Analysis: With and Without Segment Controls



## Individual Factor Contributions to Revenue Variance



### Key Findings (Patrick's sentence per variable requirement):

- Time on page explains 64.7% of revenue variance (primary driver)
- Device type explains 29.9% of variance (desktop vs mobile efficiency differences)
- Traffic source explains 3.7% of variance (quality differences across channels)
- Audience segment explains 14.0% of variance (loyalty impacts monetization)
- Combined model explains 77.5% of total variance

# Results Interpretation & Strategic Recommendations

## RELATIONSHIP SHAPE:

Analysis shows LINEAR relationship with consistent returns to engagement improvements. This linear pattern supports sustained optimization investment.

## SEGMENT DOMINANCE:

Device Performance: Desktop users show highest revenue efficiency, generating 0.05113 revenue per minute vs 0.01922 for mobile.

Traffic Quality: Email Marketing generates the highest average revenue, indicating premium audience quality and engagement patterns.

Strategic Implication: Focus optimization resources on high-performing segments while developing specific strategies for underperforming but high-volume segments.

## ACTIONABLE TAKEAWAYS:

- INVEST IN HIGH-TIME-ON-PAGE EXPERIENCES: Especially optimize desktop experiences where ROI is highest. Each second of improvement = \$0.000493 per user.
- CONTENT STRATEGY PIVOT: Shift from pageview optimization to engagement quality. Longer content formats show measurable revenue returns.
- TRAFFIC ACQUISITION FOCUS: Prioritize email marketing and similar high-intent sources over volume-based social media traffic.
- MEASUREMENT FRAMEWORK: Implement engagement-time KPIs alongside traditional metrics. A/B test with session duration as primary success metric.
- DEVICE-SPECIFIC OPTIMIZATION: Deploy differentiated strategies - desktop can handle longer-form content while mobile needs quick, engaging formats.

**REVENUE IMPACT EXAMPLE: For a publisher with 500K monthly users, a modest 30-second engagement improvement would generate \$88,767 in additional annual revenue.**