

# Daniel Pace

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## Education

### B.S. Psychology (Expected Winter 2026)

Southern Oregon University, Ashland, OR

- GPA: 3.83
- Relevant Coursework: Research Methods, Cognitive Psychology, Neuroscience, Statistics, Learning & Cognition
- Includes Associate of Arts Oregon Transfer (GPA: 3.92) from Linn-Benton Community College

## Research Interests

- Decision-making under uncertainty and structural fragility in information environments
- Cognitive scaffolding and interface design for neurodivergent users (ADHD/ASD-informed)
- Human-AI interaction, assistive technology ethics, and autonomy preservation
- Computational modeling of cognitive processes and emergent decision systems
- Engineering psychology and applied cognitive science in technology design

## Research Experience

### AI Learning Assistant, Research & Policy

Center for the Advancement of Teaching and Learning (CATL)

Southern Oregon University (2024–2025)

- Investigated how interface design choices in AI-assisted learning environments affect cognitive load distribution and decision-making quality in high-uncertainty academic contexts
- Developed and validated a sentiment analysis pipeline converting qualitative student feedback into structured JSON data, performing multi-class sentiment classification to identify patterns in student AI usage and concerns
- Created evaluation protocols for OpenAI's Safety Testing Program, systematically analyzing AI persuasion patterns, academic integrity vulnerabilities, and ethical safeguards in educational contexts
- Developed the Human-AI Creative Collaboration (HAIC) framework, a theoretical model describing cognitive processes and agency distribution in hybrid human-AI creative systems

- Co-authored institutional whitepapers on AI ethics and academic integrity, translating empirical findings into actionable policy recommendations

## Computational Research Projects

### **Structural Coherence Framework for Decision Analysis** (2023–Present)

*Research Question:* Can decision failures be predicted by analyzing the structural topology of information environments rather than choice content?

- Developed a computational framework for evaluating decision contexts across five structural dimensions: continuity (identity stability), differentiation (role clarity), contextual fit (situational appropriateness), accountability (causal transparency), and reflexivity (safe adjustability)
- Framework decomposed from first-principles analysis of recurring structural patterns across physical and cognitive domains
- Implemented as working applications demonstrating practical utility for personal decision-making, interface design, and cognitive tool development
- Testing shows consistent diagnostic scoring of decision stability across different user contexts independent of domain-specific content

### **Relational Coherence Navigator (CoNav)** (2024–Present)

*Application:* Browser-based decision support tool implementing structural coherence framework

- Interactive web application providing real-time structural analysis of user-described decision environments
- LLM-based natural language processing for contextual assessment across five coherence dimensions
- Generates composite coherence scores (0-1 scale) with interpretive bands (fragmented, strained, mixed, stable, coherent)
- Provides non-directive recommendations based on structural patterns rather than normative judgments
- Designed specifically to support neurodivergent decision-making by scaffolding executive function without eroding autonomy

### **Emergence Engine (E<sup>2</sup>) – Agent-Based Cognitive Simulation** (2023–Present)

*Research Question:* How do structural features of decision environments (resource distribution, information topology, feedback availability) predict agent decision stability independent of agent-specific parameters?

- Developed browser-based simulation in JavaScript modeling adaptive behavior across ~20 behavioral parameters in resource-constrained environments
- Implements Cross-Entropy Method (CEM) optimization with adaptive heuristics for evolving behavioral strategies

- Observed emergent differentiation of survival strategies (efficient "cultivator" vs. mobile "forager" archetypes) from identical starting conditions under different fitness objectives
- Demonstrated spontaneous phase transitions from independent to collective movement patterns under resource scarcity
- Investigating parallels between emergent system dynamics and human decision-making under cognitive load, particularly ADHD-related attention dynamics

### **ACE (Adaptive Cognitive Enhancement) Application (2024–Present)**

*Application:* Gamified task-tracking system for executive function support

- Built using Next.js and Supabase, grounded in behavioral activation principles and ADHD/ASD-informed executive function research
- Incorporates variable reinforcement schedules, cognitive load reduction strategies, and modular task decomposition
- Adaptive reward system scales task value based on environmental difficulty using exponential moving average of completion times
- Interface design minimizes decision friction while preserving user agency and intrinsic motivation
- Implementing user-centered design methodology to evaluate usability and behavioral outcomes

### **Mindi – AI-Driven Chatbot & Organizational Tool (2024–Present)**

*Application:* Conversational interface for knowledge management and episodic memory scaffolding

- Developed AI-driven interface reducing cognitive load in information organization and retrieval
- Designed to support episodic memory scaffolding and executive function challenges common in ADHD populations
- Implements natural language processing for context-aware information storage and retrieval

## **Community Development & Applied Psychology Experience**

### **Community Developer & Leadership Educator**

InterVarsity Christian Fellowship (2013–Present)

- Designed and facilitated group decision-making processes and conflict resolution frameworks for college student communities across 4 university campuses, observing how structural interventions affect decision quality under high uncertainty and social complexity
- Developed leadership training curriculum emphasizing executive function scaffolding, systems thinking, and adaptive decision-making strategies for emerging adults with diverse cognitive styles and backgrounds

- Managed residential community program (12-person capacity) creating structured living environments that balanced individual autonomy with collective coordination, testing principles of community coherence and sustainable social systems design
- Conducted ongoing informal assessment of community health, individual development trajectories, and intervention effectiveness through longitudinal observation of students across 1-4 year periods
- Coordinated regional leadership teams and multi-campus initiatives, designing scalable organizational structures and communication systems that maintained coherence across distributed groups
- Applied principles of behavioral psychology, group dynamics, and organizational development in real-time settings, developing practical understanding of how environmental structure affects cognition and behavior in naturalistic contexts

## **Publications & Scholarly Output**

### **Technical Reports & Frameworks**

- Pace, D. (2024). *Rethinking Academic Integrity in the Age of AI*. Southern Oregon University.
- Pace, D. (2024). *Proposal for OpenAI's Safety Testing Program*. Southern Oregon University.
- Pace, D. (2024). *Human-AI Creative Collaboration Framework (HAIC)*.

### **Conference Presentations**

- Pace, D. (2024). *Cognitive Theories, Attention Dynamics, and Memory Mechanisms*. Poster presented for History of Psychology, Southern Oregon University.

## **Research Methods Training**

- *Effects of Digital Therapy Interventions on Student Stress* (2024): Designed research protocol investigating CBT-style digital interventions including literature review, experimental design, power analysis, and statistical analysis plan
- *Frustration and Mood Effects in ASD* (2025): Integrated empirical literature with cognitive theory examining emotional regulation, frustration tolerance, and sensory load in autistic individuals

## **Technical Skills**

### **Human-Computer Interaction & Interface Design**

- User Interface Design, User-Centered Design Methodology, Usability Evaluation
- Cognitive Load Assessment, Decision Support System Design
- Interactive Prototyping, Information Architecture
- Frameworks: React, Next.js, Tailwind CSS

## **Computational Modeling & Development**

- Programming: JavaScript, Python, MATLAB, VBA
- Agent-Based Modeling, Cognitive Simulation, Reinforcement Learning (Cross-Entropy Method)
- Natural Language Processing, LLM Integration
- Version Control: Git/GitHub

## **Data Analysis & Statistics**

- Data Visualization, Statistical Modeling, Regression Analysis
- Sentiment Analysis, Text Classification
- Tools: Python (pandas, numpy), MATLAB, Excel, Qualtrics
- Database Management: SQL, Supabase

## **Research Methodologies**

- Experimental Design, Mixed Methods Synthesis
- Cognitive Modeling, Systems Analysis
- Human-AI Interaction Studies, Applied Ethics Analysis
- Computational Prototyping and Iterative Design

## **Professional Experience**

### **Data Systems & Process Analyst**

Palm Harbor / Cavco Manufacturing (2022–Present)

- Developed AI workflow applications for document processing and data reconciliation, reducing manual cognitive load in high-volume data environments
- Designed decision-support tools and automated workflows informed by cognitive psychology principles
- Reworked payroll systems using automation tools to streamline complex processes

### **Practicum Student**

Jackson Street Youth Services (2024)

- Completed 150+ hours supporting client documentation systems and digital workflow improvements

## **Awards & Honors**

- Peak Student of the Year, Southern Oregon University (2024–2025)
- Phi Kappa Phi Honors Society Member

- Provost's List, Southern Oregon University (Spring 2025, Fall 2024)

## **Professional Development**

- Google Data Analytics Professional Certificate (Coursera)
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*References available upon request*