Karol Silva, Ph.D., M.P.H., CPSI, CPST

Senior Consultant

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Background

Dr. Karol Silva is a human factors consultant with interdisciplinary training in child and adolescent development and public health. She holds a Ph.D. in developmental psychology from Temple University and master's in public health from Brown University. She is also a Certified Playground Safety Inspector (CPSI) and Child Passenger Safety Technician (CPST). A significant portion of Dr. Silva's work addresses child and adolescent safety, with particular attention to risk behaviors, cognitive and motor development, contextual factors, and the role of caregiver supervision. She also evaluates how factors such as risk perception and hazard awareness contribute to accident patterns across age groups, and how caregiver practices shape health and injury outcomes.

She has conducted usability studies evaluating how children and adults interact with products in a range of environments. Her work considers human capabilities and limitations and the implications on product design, labeling, and safety communication. Dr. Silva has extensive experience analyzing the appropriateness of product features, messaging, and instructions for intended age groups.

She has deep knowledge of consumer product regulations and standards, including the Consumer Product Safety Improvement Act, Poison Prevention Packaging Act, and Reese's Law. She routinely advises on product classification and age grading based on the CPSC's Age Determination Guidelines and evaluates the relative effectiveness of child-resistant design features. Dr. Silva also leverages large-scale injury surveillance data, including the CPSC's National Electronic Injury Surveillance System, to perform injury pattern analysis and support risk assessments.

In addition to her specialization in child safety, Dr. Silva has broad experience investigating human factors and human performance in a wide range of contexts, including pedestrian behavior, trip and falls, warnings and labeling, and driver behavior. She brings an interdisciplinary perspective to human factors analysis, applying behavioral science, public health, and regulatory knowledge to analyze user behavior, product interaction, and risk communication.

Professional Engagements

- **Sample Investigations and Project Experience**
  - Evaluated and developed warnings and safety information for products, including juvenile products, children's products, virtual reality products, playground equipment, household appliances, and agricultural machinery.
  - Designed and conducted studies to assess children's ability to access coin cell or button batteries in consumer products, and to climb or overcome pool barriers.
  - Assessed the developmental and age appropriateness of products or activities.
  - Evaluated warning signage and traffic control devices in construction areas, including the conspicuity and visibility of pavement markers during nighttime conditions.
  - Addressed the cognitive, behavioral, and physical capabilities and limitations of children and their interactions with products (e.g., bicycles, pool barriers, strollers, and playground equipment) and environments (e.g., parking lots, intersections, and marked and unmarked crosswalks).
  - Assessed the visibility and conspicuity of stimuli, including objects, pedestrians, and physical attributes of the environment, and addressed these factors in accident causation and avoidance.
  - Reviewed and analyzed injury and fatality data to identify behavior patterns associated with accidents.
  - Designed and conducted studies to evaluate consumers' perceptions of safety and risk in different contexts.

Professional Experience

- **Rimkus** **2025 – Present**
  - Senior Consultant
    Evaluate human factors issues in accidents across various contexts. Provide expert analysis and testimony in cases involving premises liability, personal injury, and product liability, among others.

- **Exponent** **2020 – 2025**
  - Managing Scientist (2024-2025)
  - Senior Scientist (2022-2024)
  - Scientist (2020-2022)
    Investigated numerous accidents involving issues related to visibility, gaze behavior, risk-taking behavior, decision-making, attention, perception-reaction, hazard awareness, risk communication, and child development, in matters arising from defective design, inadequate training, and failure to warn claims. Provided expert analysis and testimony in cases involving premises liability, personal injury, and product liability. Assisted clients with proactive consulting in product use/misuse research, product design, testing, and compliance, instructions, warnings, and manual development.

- **Children's Hospital of Philadelphia** **2017 – 2020**
  - Postdoctoral Fellow
    Investigated human factors issues related to parenting, communication, and cognitive development in the management of type 1 diabetes and health outcomes of children and adolescents. Research was funded by the National Institute of Child Health and Human Development.

- **Temple University, Department of Psychology** **2012 – 2017**
  - Graduate researcher
    Conducted experimental studies to evaluate how social context (e.g., peer presence) and mental fatigue impact decision-making and risk-taking behavior. Research was funded by the Department of Defense.

- **Drexel University, School of Public Health** **2009 – 2012**
  - Research Associate
    Investigated patterns of prescription drug use and misuse, risk awareness, risk perception, and decision-making in young adults. Research was funded by the National Institute of Health.

Education and Certifications

- **Developmental Psychology, Ph.D.:** Temple University (2017)
- **Master of Public Health:** Brown University (2009)
- **Psychology, B.A.:** Rutgers University, Rutgers College (2007)
- **Certified Playground Safety Inspector** (CPSI)
- **Certified Child Passenger Safety Technician** (CPST)

Professional and Trade Associations

- **Human Factors and Ergonomics Society**
- **International Play Equipment Manufacturers Association**

Standards Committee Membership

- **ASTM F13:** Pedestrian/Walkway Safety and Footwear
- **ASTM F15:** Consumer Products
- **ASTM F15.09:** Home Playground Equipment
- **ASTM F15.12:** Firmness and Breathability of Juvenile Products
- **ASTM F15.17:** Carriages, Strollers, Walkers and Stationary Activity Centers
- **ASTM F15.22:** Toy Safety
- **ASTM F15.49:** Pool Safety Standards
- **ASTM F15.60:** Portable Pools
- **ASTM F15.65:** General Juvenile Product Standards

Publications and Presentations

- Silva, K., Breeland, N., Clark, A.M., Öztekin, I., and Kelly, R.L. (2025). **"Effects of virtual reality use in children aged 10 to 12 years."** Frontiers in Virtual Reality, 6.
- Silva, K. **"The Teen Brain."** In K.R., Ginsburg, and Z., McClain (Eds.), Reaching teens: Strength-based communication strategies to build resilience and support healthy adolescent development (2nd ed). Chicago, IL: American Academy of Pediatrics.
- Miller, V.A., Silva, K., Friedrich, E., Robles, R.J., and Ford, C. (2020). **"Efficacy of a primary care-based intervention to promote parent-teen communication and well-being: A randomized controlled trial."** Journal of Pediatrics, 222, 200-206.
- Silva, K., and Miller, V.A. (2019). **"The role of cognitive and psychosocial maturity in type 1 diabetes management."** Journal of Adolescent Health*, 64,* 622-630.
- Silva, K., and Miller, V.A. (2019). **"Parenting and the development of impulse control in youth with type 1 diabetes: The mediating role of negative affect."** Applied Developmental Science, 26(1), 94-108.
- Silva, K., Patrianakos, J., Chein, J., and Steinberg, L. (2017). "**Joint effects of peer presence and fatigue on risk and reward processing in late adolescence."** Journal of Youth & Adolescence, 46, 1878-1890.

- Silva, K., Chein, J., and Steinberg, L. (2016). **"Adolescents in peer groups make more prudent decisions when a slightly older adult is present."** Psychological Science, 27, 322-330.
- Silva, K., Shulman, E.P., Chein, J., and Steinberg, L. (2015). **"Peers increase adolescents' exploratory behavior and sensitivity to positive and negative feedback."** Journal of Research on Adolescence, 26, 696-705.
- Silva, K., Lankenau, S.E., and Kecojevic, A. (2013). **"Perceived drug use functions and risk-reducing practices among young prescription polydrug users."** Journal of Drug Issues, 43, 483-496.
- **"Trouble in toy land? What, exactly, is a toy?"** Presentation. Defense Research Institute Product Liability conference. Miami, FL. February 2025.
- **"Leveraging human factors and biomechanics in product liability defense."** Presentation. Duane Morris. Philadelphia, PA. April 2025.
- **"From minds to movements: Human factors and biomechanics unraveled."** Presentation. National Association of Subrogation Professionals annual meeting. Phoenix, AZ. October 2024.
- **"To err is human, to make it hard to do is divine: Utilizing human factors for risk mitigation in healthcare settings."** Presentation. New Jersey Defense Association annual meeting, Washington, DC. June 2023.
- **"Adolescent development and risk-taking propensity—Why it matters for defense."** Presentation. Defense Research Institute annual meeting, San Antonio, TX. October 2023.