

Richard A. Tyrrell, Ph.D.

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Education

- Ph.D. Psychology, The Pennsylvania State University, 1993. Major: Experimental Psychology. Minor: Health Psychology. Dissertation: "Exploring the behavioral link between the oculomotor and cardiovascular systems." Graduate Advisor: Herschel W. Leibowitz, Ph.D.
- M.S. Psychology, The Pennsylvania State University, 1989. Thesis: "Vergence effort and visual fatigue."
- B.A. Psychology, Hartwick College, Oneonta, New York, 1985, *cum laude*, departmental distinction.

Professional Experience

- 2004-present **Professor**, Department of Psychology, Clemson University, Clemson, SC
Teaching responsibilities (since 1993):
- Introduction to Psychology (Psych 201)
 - Introductory Experimental Psychology (Psych 309, L309)
(a lecture & lab course in statistics)
 - Human Factors Psychology (Psych 435)
(undergraduate seminar)
 - Advanced Human Factors (Psych 835)
(graduate seminar)
 - Human Perception & Performance (Psych 822)
(graduate seminar)
 - Supervise Master's Theses (Psych 890, 891)
 - Supervise undergraduate Honors Theses (Psych 490)
 - Supervise graduate and undergraduate independent research projects (Psych 497, 897)
 - Supervise Doctoral Dissertations (Psych 991)
- 1999–2004 **Associate Professor**, Department of Psychology, Clemson University, Clemson, SC.
- 2001, 2006 **Visiting Research Fellow**, Centre for Eye Research, School of Optometry, Queensland University of Technology, Brisbane, Australia (March – July 2001, June 2006).
- 1993-1999 **Assistant Professor**, Department of Psychology, Clemson University.
- 1987–1993 **Research Assistant** for Herschel W. Leibowitz, Ph.D., The Pennsylvania State University.
- 1989–1993 **Teaching Assistant** for courses in Visual Perception and in Engineering Psychology. The Pennsylvania State University.
- 1985–1987 **Full-time Research Assistant and Computer Programmer** for D. Alfred Owens, Ph.D., Franklin & Marshall College, Lancaster, PA.

Research Interests

Human Factors: Vision in challenging conditions; Transportation safety

Visual Perception: Oculomotor processes; visual guidance and the visual control of locomotion; space perception; perception and action

Peer-reviewed publications (citation analysis: http://scholar.google.com/citations?hl=en&user=CJ0_Fc8AAAAAJ)

Whetsel Borzendowski, S.A., Tyrrell, R.A., Stafford Sewall, A., Britt, T.W., & Rosopa, P.J. (under review). *Applying the Theory of Planned Behavior to drivers' use of high beam headlamps.*

Wood, J.M., Tyrrell, R.A., Lacherez, P., & Black, A.A. (in press). Night-time pedestrian conspicuity: Effects of clothing on drivers' eye movements. *Ophthalmic and Physiological Optics.*

Fekety, D.K., Edewaard, D.E., Stafford Sewall, A.A., & Tyrrell, R.A. (2016). Electroluminescent materials can further enhance the nighttime conspicuity of pedestrians wearing retroreflective materials. *Human Factors*, 58, 976-985.

Tyrrell, R.A., Wood, J.M., Owens, D.A., Whetsel Borzendowski, S., Stafford Sewall, A. (2016). The conspicuity of pedestrians at night: A review. *Clinical and Experimental Optometry*, 99, 425-434.

Stafford Sewall, A.A., Whetsel Borzendowski, S.A., Tyrrell, R.A., Stephens, B.R., & Rosopa, P.J. (2016). Observers' judgments of the effects of glare on their visual acuity for high and low contrast stimuli. *Perception*, 45, 755-767.

Whetsel Borzendowski, S.A., Stafford Sewall, A. A., Rosopa, P.J., & Tyrrell, R.A. (2015). Drivers' judgments of the effect of headlight glare on their ability to see pedestrians at night. *Journal of Safety Research*, 53, 31-37.

Stafford Sewall, A.S., Whetsel Borzendowski, S.A., & Tyrrell, R.A. (2014). The accuracy of drivers' judgments of the effects of headlight glare on their own visual acuity. *Perception*, 43, 1203-1213.

Wood, J.M., Lacherez, P., & Tyrrell, R.A. (2014). Seeing pedestrians at night: Effect of driver age and visual abilities. *Ophthalmic and Physiological Optics*, 34, 452-458.

Wood, J.M., Marszalek, R., Lacherez, P., & Tyrrell, R.A. (2014). Configuring reflective markings to enhance the nighttime conspicuity of road workers. *Accident Analysis & Prevention*, 70, 209-214.

Whetsel Borzendowski, S.A., Rosenberg, R.L., Stafford Sewall, A.A., Tyrrell, R.A. (2013). Pedestrians' estimates of their own nighttime conspicuity are unaffected by severe reductions in headlight illumination. *Journal of Safety Research*, 47, 25-30.

Wood, J.M., Tyrrell, R.A., Marszalek, R., Lacherez, P., & Carberry, T.P. (2013). Bicyclists overestimate their own night-time conspicuity and underestimate the benefits of retroreflective markers on the moveable joints. *Accident Analysis & Prevention*, 55, 48-53.

Wood, J.M., Tyrrell, R.A., Chaparro, A., Marszalek, R., Carberry, T.P., & Chu, B.S. (2012). Even moderate visual impairments degrade drivers' ability to see pedestrians at night. *Investigative Ophthalmology & Visual Science*, 53, 2586-2592.

Wood, J.M., Tyrrell, R.A., Marszalek, R., Lacherez, P., Carberry, T.P., & Chu, B.S. (2012). Using reflective clothing to enhance the conspicuity of bicyclists at night. *Accident Analysis & Prevention*, 45, 726-730.

Wood, J.M., Tyrrell, R.A., Marszalek, R., Lacherez, P., Chaparro, A., & Britt, T.W. (2011). Using biological motion to enhance the conspicuity of roadway workers. *Accident Analysis & Prevention*, 43, 1036-1041.

Wood, J.M., Tyrrell, R.A., Marszalek, R., Lacherez, P., Carberry, T.P., Chu, B.S. & King, M.J. (2010). Cyclist visibility at night-time: Perceptions of visibility do not necessarily match reality. *The Journal of the Australasian College of Road Safety*, 21, 56-60.

Brooks, J.O., Goodenough, R.R., Crisler, M.C., Klein, N.D., Alley, R.L., Koon, B.L., Logan, W.C., Ogle, J.H., Tyrrell, R.A., & Wills, R.F. (2010). Simulator sickness during driving simulation studies. *Accident Analysis & Prevention*, 42, 788-796.

Moss, J.D., Muth, E.R., Tyrrell, R.A., & Stephens, B.R. (2010). Perceptual thresholds for visual lag: Effects of field of view and psychophysical technique. *Displays*, 31, 143-149.

Murphy, H.A., Duchowski, A.T., & Tyrrell, R.A. (2009). Hybrid image/model-based gaze-contingent rendering. *Association for Computing Machinery Transactions on Applied Perception*, 5(4), 1-21.

Tyrrell, R.A., Wood, J.M., Chaparro, A., Carberry, T.P., Chu, B.-S., & Marszalek, R.P. (2009). Seeing pedestrians at night: Visual clutter does not mask biological motion. *Accident Analysis & Prevention*, 41, 506-512.

Balk, S.A., Tyrrell, R.A., Brooks, J.O., & Carpenter, T.L. (2008). Highlighting human form and motion information enhances the conspicuity of pedestrians at night. *Perception*, 37, 1276-1284.

Tyrrell, R.A., Balk, S.A., Switzer, F.S., III, & Brooks, J.O. (2007). Effects of tire pressure monitoring systems on tire pressures in consumer vehicles. *Transportation Research Record: Journal of the Transportation Research Board*, 2018, 15-21.

Brooks, J.O., Tyrrell, R.A., & Frank, T.A. (2005). The effects of severe visual challenges on the steering performance of visually healthy young drivers. *Optometry and Vision Science*, 82, 689-697.

Wood, J.M., Tyrrell, R.A., & Carberry, T. (2005). Limitations in drivers' ability to recognize pedestrians at night. *Human Factors*, 47(3), 644-653.

Gugerty, L., Tyrrell, R.A., Aten, T.R., & Edmonds, K.A. (2004). Sub-pixel addressing improves reading performance. *Association for Computing Machinery Transactions on Applied Perception*, 1, 81-101.

Tyrrell, R.A., Patton, C.W., & Brooks, J.O. (2004). Educational interventions successfully reduce pedestrians' overestimates of their own nighttime visibility. *Human Factors*, 46, 170-182.

Tyrrell, R.A., Wood, J.W., & Carberry, T. (2004). On-road measures of pedestrians' estimates of their own nighttime conspicuity. *Journal of Safety Research*, 35, 483-490.

Francis, E.L., Jiang, B.-C., Owens, D.A., & Tyrrell, R.A. (2003). Accommodation and vergence require effort-to-see. *Optometry and Vision Science*, 80 (6), 467-473.

Tyrrell, R.A., & Patton, C.W. (2003). Educating pedestrians about their own nighttime visibility: An application of Leibowitzian principles. In J.T. Andre, D.A. Owens, & L.O. Harvey (Eds.), *Visual Perception: The Influence of H. W. Leibowitz*. Washington, D.C.: American Psychological Association.

Aten, T., Gugerty, L., & Tyrrell, R.A. (2002). Legibility of words rendered using ClearType™. *Proceedings of the Human Factors and Ergonomics Society*, 46th Annual Meeting, 1684-1687.

Tyrrell, R.A., Pasquale, T.B., Aten, T., & Francis, E.L. (2001). Empirical evaluation of user responses to reading text rendered using ClearType™ Technologies. Technical Paper in *Society for Information Display 2001 Digest of Technical Papers*, 1205-1207. Playa del Rey, CA: Society for Information Display.

Tyrrell, R.A., Pearson, M.A., & Thayer, J.F. (2000). Behavioral links between the oculomotor and cardiovascular systems. In O. Franzén, H. Richter, & L. Stark (Eds.), *Accommodation and Vergence Mechanisms in the Visual System*. Basel, Switzerland: Birkhäuser Verlag.

- Owens, D.A., & Tyrrell, R.A. (1999). Effects of luminance, blur, and age on nighttime visual guidance: A test of the selective degradation hypothesis. *Journal of Experimental Psychology: Applied*, 5(2), 115-128.
- Jebaraj, D., Tyrrell, R.A., & Gramopadhye, A.K. (1999). Industrial inspection performance depends on both viewing distance and oculomotor characteristics. *Applied Ergonomics*, 30, 223-228.
- Tyrrell, R.A., & Patton, C.W. (1998). The effectiveness of educating pedestrians about their own nighttime visibility. Santa Monica, CA: Human Factors and Ergonomics Society. *Proceedings of the Human Factors & Ergonomics Society 42nd Annual Meeting*, 1205-1209.
- Leibowitz, H.W., Owens, D.A., & Tyrrell, R.A. (1998). The assured clear distance ahead rule: Implications for nighttime traffic safety and the law. *Accident Analysis and Prevention*, 30, 93-99.
- Tyrrell, R.A., Pearson, M.A., & Andre, J.T. (1997). The visual guidance of blind walking: Information and individual differences. In M.A. Schmuckler & J.M. Kennedy (Eds.), *Studies in Perception and Action IV: Ninth International Conference on Perception and Action* (pp. 359-362). Mahwah, NJ: Lawrence Erlbaum Associates.
- Friedman, B. H., Thayer, J. F., & Tyrrell, R. A. (1996). Spectral characteristics of heart period variability during cold face stress and shock avoidance. *Clinical Autonomic Research*, 6, 147-152.
- Best, P. S., Littleton, M. H. & Gramopadhye, A. K., & Tyrrell, R. A. (1996). Relations between individual differences in oculomotor resting states and visual inspection performance. *Ergonomics*, 39, 35-40.
- Nicholson, M. E., Andre, J. T., Tyrrell, R. A., Wang, M., & Leibowitz, H. W. (1995). Effects of moderate dose alcohol on visual contrast sensitivity for stationary and moving targets. *Journal of Studies on Alcohol*, 56, 261-266.
- Tyrrell, R. A., Thayer, J. F., Friedman, B. H., Leibowitz, H. W., & Francis, E. L. (1995). A behavioral link between the oculomotor and cardiovascular systems. *Integrative Physiological and Behavioral Science*, 30, 46-67.
- Andre, J. T., Tyrrell, R. A., Leibowitz, H. W., Nicholson, M. E., & Wang, M. Q. (1994). Measuring and predicting the effects of alcohol consumption on static and dynamic contrast sensitivity. *Perception & Psychophysics*, 56, 261-267.
- Friedman, B. H., Thayer, J. F., Borkovec, T. D., Tyrrell, R. A., Johnsen, B. -H, & Columbo, R. (1993). Autonomic characteristics of nonclinical panic and blood phobia. *Biological Psychiatry*, 34, 298-310.
- Leibowitz, H. W., Tyrrell, R. A., Andre, J. T., Eggers, B. G., & Nicholson, M. E. (1993). *Dynamic visual contrast sensitivity*. Technical report published by AAA Foundation for Traffic Safety, Washington, DC
- Tyrrell, R. A., Rudolph, K. K., Eggers, B. G., & Leibowitz, H. W. (1993). Evidence for the persistence of visual guidance information. *Perception & Psychophysics*, 54, 431-438.
- Owens, D. A., & Tyrrell, R. A. (1992). Lateral phoria at distance: Contributions of accommodation. *Investigative Ophthalmology & Visual Science*, 33, 2733-2743.
- Scialfa, C. T., Garvey, P. M., Tyrrell, R. A., Goebel, C. C., & Leibowitz, H. W. (1992). Age differences in dynamic contrast thresholds. *Journal of Gerontology: Psychological Sciences*, 47, P172-175.
- Simoneau, G. G., Leibowitz, H. W., Ulbrecht, J. S., Tyrrell, R. A., & Cavanagh, P. R. (1992). The effects of visual factors and head orientation on postural steadiness in women 55-70 years of age. *Journal of Gerontology: Medical Sciences*, 47, M151-158.
- Simoneau, G. G., Cavanagh, P. R., Ulbrecht, J. S., Leibowitz, H. W., & Tyrrell, R. A. (1991). The influence of visual factors on fall-related kinematic variables during stair descent by older women. *Journal of Gerontology: Medical Sciences*, 46, M188-195.

Scialfa, C. T., Guzy, L. T., Leibowitz, H. W., Garvey, P. M., & Tyrrell, R. A. (1991). Age differences in estimating vehicle velocity. *Psychology and Aging*, 6, 60-66.

Tyrrell, R. A. (1991). Vergence effort and prolonged work. Technical paper in *Society for Information Display International Symposium Digest of Technical Papers* (pp. 475-478). Playa del Rey, CA: Society for Information Display.

Jiang, B. C., Scialfa, C. T., Tyrrell, R. A., Garvey, P. M., & Leibowitz, H. W. (1990). Bandwidth of the contrast sensitivity function as an index of spatial vision with applications to refraction. *Optometry & Vision Science*, 67, 260-267.

Tyrrell, R. A., & Leibowitz, H. W. (1990). The relation of vergence effort to reports of visual fatigue following prolonged near work. *Human Factors*, 32, 341-357.

Scialfa, C. T., Tyrrell, R. A., Garvey, P. M., Deering, L. M., Leibowitz, H. W., & Goebel, C. C. (1988). Age differences in Vistech near contrast sensitivity. *American Journal of Optometry and Physiological Optics*, 65, 951-956.

Tyrrell, R. A., & Owens, D. A. (1988). A new technique to assess the resting states of the eyes and other threshold phenomena: The Modified Binary Search (MOBS). *Behavior Research Methods, Instruments, & Computers*, 20, 137-141.

Technical Reports

Edewaard, D.E., Fekety, D.K., Szubski, E.C., & Tyrrell, R.A. (2016, December). An open-road study of the conspicuity benefits of bicyclist apparel in daylight. Technical report provided to Trek Bicycle Corporation.

Edewaard, D.E., Fekety, D.K., & Tyrrell, R.A. (2016, May). *An open-road study of the conspicuity of bicycle taillights in daylight*. Technical report provided to Trek Bicycle Corporation.

Tyrrell, R.A., Fekety, D.K., Edewaard, D.E. (2016, January). *The conspicuity benefits of bicycle taillights in daylight*. Technical report provided to Trek Bicycle Corporation.

Tyrrell, R.A., Whetsel, S.A., Sewall, A.S., & Fekety, D.K. (2012, December). *Athletes' perspectives on conspicuity-enhancing garments before and after an educational intervention*. Technical report provided to Nike Apparel, Inc.

Tyrrell, R.A., Whetsel, S.A., & Sewall, A.S. (2012, November). *Nighttime pedestrian conspicuity: Summary and design recommendations*. Technical report provided to Nike Apparel, Inc.

Tyrrell, R.A., Whetsel, S.A., & Sewall, A.S. (2012, November). *The nighttime conspicuity of pedestrians: Current state of the scientific literature*. Technical report provided to Nike Apparel, Inc.

Tyrrell, R.A., Whetsel, S.A., Sewall, A.S., & Fekety, D.K. (2012, November). *The distribution of headlight illumination on pedestrians*. Technical report provided to Nike Apparel, Inc.

Awards, Honors, and Memberships

Member of the Editorial Board for the journal *Human Factors* (published by the Human Factors and Ergonomics Society). 2014-present.

Queensland University of Technology's Carla Patterson Publication Award for the publication "Using reflective clothing to enhance the conspicuity of bicyclists at night." Awarded December 2012.

Human Factors and Ergonomics Society's A. R. Lauer Safety Award for outstanding contributions to human factors aspects in the area of safety. Awarded October, 2012 in Boston, MA. (From the HFES website: "Richard A. Tyrrell... received the A. R. Lauer Safety Award in recognition of his validated, innovative techniques both to enhance nighttime visibility of pedestrians and to educate road users of the unavoidable hazards of reduced visibility at night. This program of research offers economical and highly effective routes to reducing pedestrian accidents. This research also holds the promise of saving thousands of lives annually in the United States and millions worldwide.")

Member: Graduate Accreditation Committee of the Human Factors and Ergonomics Society (2010-present).

Member: Committee on Visibility [AND40], Transportation Research Board, a division of the National Research Council. Appointed to four year term beginning April, 2007. Reappointed to second term (April 2011-April 2014) and third term (April 2014-April 2017).

Named an Outstanding Professor by the Clemson University undergraduate student government. October, 2007.

Psi Chi Outstanding Professor Award from the Clemson University chapter of Psi Chi, the National Honor Society in Psychology. April, 2003.

2003 Outstanding Paper Award from the Pedestrian Committee (A3B04) of the Transportation Research Board.
Paper: Tyrrell, R.A., Wood, J.M., and Carberry, T. (2003). *On-Road Measures of Pedestrians' Estimates of Their Own Nighttime Visibility: Effects of Clothing, Beam, and Age*, presented at the 81st Annual Meeting of the Transportation Research Board, Washington, D.C.

Visiting Research Fellowship awarded by Queensland University of Technology (Brisbane, Australia). April – July 2001. This fellowship partially funded my 4-month sabbatical visit to QUT. While there, I collaborated with Prof. Joanne Wood in conducting research on the nighttime visibility of pedestrians.

Psi Chi Teaching Award, awarded by the Clemson University chapter of Psi Chi, the National Honor Society in Psychology. April, 1999.

Emerging Scholar Award for Research Excellence, Clemson University, College of Business and Behavioral Science, May, 1998.

First prize for "Measuring and predicting the effects of alcohol on visual sensitivity," presented at the annual Graduate Research Exhibit, Pennsylvania State University, March 1992.

Travel Fellowship from Society for Information Display. Travel support to present at meeting of the Society for Information Display, Anaheim, CA, May 1991.

Travel Fellowship from University of Rochester. Travel support to attend symposium on "Orientation in Space" at Center for Visual Science, University of Rochester, Rochester, NY, 1990.

Third prize for "Perceptual and atmospheric contributions to the moon illusion," presented at the annual Graduate Research Exhibit, Pennsylvania State University, March 1990.

Fellowship from the John Frederick Steinman Foundation, Lancaster, PA. Financial support for graduate studies during 1988-89, 1989-90 academic years.

Reviewer for:

- *Accident Analysis & Prevention*
- *Applied Ergonomics*
- *Behavior Research Methods, Instruments, & Computers*
- *Behaviour and Information Technology*
- *Biological Psychology*
- *Color Research and Application*
- *Ergonomics*
- *Human Factors*
- *Human Factors & Ergonomics Society*
- *International Journal of Applied and Basic Medical Research*
- *International Journal of Industrial Ergonomics*
- *Journal of Experimental Psychology: Applied*
- *Journal of the Optical Society of America: A*
- *Journal of the Transportation Research Board*
- *Ophthalmic and Physiological Optics*
- *Optometry & Vision Science*
- *Perception and Psychophysics*
- *PLOS ONE*
- *Psychological Science*
- *Transportation Research Board*
- *Traffic Injury Prevention*
- *Vision Research*

Member of :

- *American Psychological Association; Division 21 (Applied Experimental and Engineering Psychology)*
- *Association for Psychological Science*
- *Human Factors and Ergonomics Society*
- HFES Technical Group Memberships:
 - Educators Technical Group*
 - Forensic Technical Group*
 - Surface Transportation Technical Group*
 - Perception and Performance Technical Group*

Grants

Principal Investigator: “Enhancing the Conspicuity of Bicyclists: Part II.” (2015). Trek Bicycle Corporation. (\$41,926 total costs; January 2016-August 2016).

Principal Investigator: “Enhancing the Conspicuity of Bicyclists: Part I.” (2015). Trek Bicycle Corporation. (\$45,172 total costs; August 2015-April 2016).

Principal Investigator: “Enhancing the Nighttime Conspicuity of Athletes: Part I.” (2012). Nike Apparel. (\$35,000 total costs; August 2012 to December 2012.)

Partner Investigator: “Using ‘biological motion’ to enhance the nighttime safety of road workers, cyclists, and pedestrians.” (2009). Australian Research Council. (AUD \$337,195 total costs; July 2009 – July 2012).

Principal Investigator: “Effects of Tire Pressure Monitoring Systems on Tire Pressure and User Behavior.” (2005). Michelin Research and Development Corp. (\$96,177 total costs).

Principal Investigator: “Feasibility Study on Effects of Tire Pressure Monitoring Systems on Tire Pressure and User Behavior.” (2005). Michelin Research and Development Corp. (\$23,030 total costs).

Principal Investigator: “Using Education to Reduce Nighttime Collisions Between Pedestrians and Vehicles.” (2002, under review). South Carolina Department of Transportation, Department of Safety. (\$215,000 total costs).

Co-Investigator: “Continued Research on Reading Performance with ClearType™” (2003). Microsoft Corporation (\$120,135 total costs). Lee Gugerty, Principal Investigator.

Principal Investigator: “Dwight D. Eisenhower Graduate Transportation Fellowship” (2002-2005). U.S. Department of Transportation. Fellowship provided full funding for Doctoral Student Johnell O. Brooks. (\$103,000 total costs).

Principal Investigator: “The Effects of ClearType™ on Users’ Performance on Reading-Related Tasks.” (2002). Microsoft Corporation (\$180,000 total costs). Lee Gugerty, Co-Principal Investigator.

Co-Investigator: “Hardware and Software Upgrade to the Clemson Driving Simulator Laboratory.” (2001) South Carolina Commission on Higher Education, Research Infrastructure Grant (\$44,600 total costs).

Principal Investigator: “Travel grant to travel from Australia to San Jose, CA to present at the 2001 Annual Meeting of the Society for Information Display.” (2001) Microsoft Corporation (\$3000 total costs).

Co-Investigator: “A Driving Simulation System for Human Factors Research” (2000). Clemson University (\$111,200 total costs). Fred Switzer and Lee Gugerty, Co-Investigators.

Principal Investigator: “Empirical evaluation of ClearType Technologies: Physiological, Performance, and Preference data.” (2000). Microsoft Corporation (\$45,000 total costs).

Co-Investigator: “A Human-Technology-Interaction Laboratory for Teaching Students How to Design and Evaluate Usable Information Technology.” (2000). Clemson University Innovation Fund (\$19,940 total costs). Leo Gugerty, Principal Investigator.

Primary Faculty: “Graduate Training in Occupational Health Psychology” (1999). *American Psychological Association* (\$20,480 total costs). James A. McCubbin, Ph.D., Principal Investigator.

Principal Investigator: “The muscular basis for visual discomfort” (1993). *Office of University Research, Clemson University* (\$3000 total costs).

Thesis and Dissertation Supervision — I have chaired the following thesis and dissertation committees:

Ashley Stafford Sewall – *Exploring drivers’ reactions to headlamp glare: An empirical investigation of actual and estimated effects of glare on vision.* Doctoral dissertation, defended June 2015.

Drea K. Fekety – *A comparative analysis of electroluminescent and retroreflective materials as nighttime conspicuity aids.* Master’s thesis, defended April 2015.

Stephanie A. Whetsel Borzendowski – *Encouraging the appropriate use of high beam headlamps: An application of the Theory on Planned Behavior.* Ph.D. dissertation, defended July, 2014.

Ashley A. Stafford – *Observers’ judgments of the effects of glare on visual acuity for high and low contrast stimuli.* M.S. thesis, defended September, 2012.

Stephanie A. Whetsel – *The accuracy of drivers’ estimates of the effects of glare on their ability to recognize pedestrians at night.* M.S. thesis, defended November, 2011.

- Matthew Crisler** – *Are distracted drivers aware that they are distracted?: Exploring awareness, self-regulation, and performance in drivers performing secondary tasks.* Ph.D. dissertation, defended July, 2010.
- Rachel Rosenberg** – *The Effects of Headlight Intensity and Clothing Contrast on Pedestrians' Estimates of Their Own Visibility at Night.* M.S. thesis, defended May, 2010.
- Stacy A. Balk** – *The accuracy of observers' estimates of the effect of glare on nighttime vision: Do we exaggerate the disabling effects of glare?* Ph.D. dissertation, defended April, 2010.
- Justin S. Graving** – *Pedestrian conspicuity at night: The effects of retroreflector placement and retroreflectivity.* M.S. thesis, defended July, 2008.
- Matthew Crisler** – *The effectiveness of musical stimuli in spatial audio displays: An empirical investigation of the effects of volume and spatial processing detail.* M.S. thesis, defended August 2007.
- Stacy A. Balk** – *Nighttime pedestrian conspicuity: The effects of pedestrian movement, orientation and the configuration of retroreflective material.* M.S. thesis, defended May 2006.
- Christine E. Beck** – *How well do we know our own stereoacuity?* Undergraduate Honor's Thesis, completed April, 2006.
- Johnell O. Brooks** – *Younger and older drivers' ability to estimate their own visual and steering abilities when in challenging visual conditions.* Ph.D. dissertation, defended August, 2005.
- Katie Kimble** – *Putting biological motion to use: Importance of retroreflective marker placement on pedestrian conspicuity at night.* M.S. thesis, defended August 2004.
- Abigail Stephenson** – *The effects of font rendering technologies on visual search performance.* M.S. thesis, defended July, 2003.
- Thad Pasquale** — *Effects of a new font rendering technology and display resolution on reading speed and fatigue.* M.S. thesis, defended May, 2001.
- Rich Grutzmacher** – *Time-to-contact estimates for moving targets obtained during simulated observer motion.* M.S. thesis, defended April, 2000.
- Keith A. May** — *The effects of exercise-induced autonomic activity on oculomotor performance.* Undergraduate Honor's thesis, defended July, 1999.
- Delbert K. Marsh, II** — *Perceived brightness and detectability of colored retroreflective materials at night.* M.S. thesis, defended April, 1998.
- Chad W. Patton** — *The effects of different types of education on pedestrian estimations of their own visibility.* M.S. thesis, defended October, 1997.
- Candy S. Howard** — *An investigation of the relationships between performance on a near visual inspection task and low-contrast acuity and high-contrast acuity.* M.S. thesis, defended December, 1996.
- Melanie A. Pearson** — *Effect of arousal on oculomotor adaptation: More than meets the eye.* Undergraduate Honor's thesis, defended May, 1995. (Awarded the 1995 Psi Chi Research Award.)
- P. Scot Best** — *Perceptual and oculomotor implications of interpupillary distance settings on a head-mounted virtual display.* M.S. thesis, defended May, 1995.
- M. Kate Walton** — *The effects of age on the persistence of visual guidance information.* M.S. thesis, defended May, 1995.

Presentations and Published Abstracts

Tyrrell, R.A., Wood, J.M., Owens, D.A., Whetsel Borzendowski, S. & Stafford Sewall, A. (2016, October). *Perceiving pedestrians at night: A critical visual task*. Invited talk at the Optical Society of America's 2016 Fall Vision Meeting, Rochester, NY.

Edewaard, D.E., Fekety, D.K., & Tyrrell, R.A. (2016, September). *The conspicuity benefits of bicycle taillights in daylight*. Scheduled for presentation at the 2016 Annual Meeting of the Human Factors and Ergonomics Society, Washington, DC.

Tyrrell, R.A., Wood, J.M., Fekety, D.K., & Edewaard, D.E. (2016, June). *Using biological motion to enhance the conspicuity of pedestrians at night*. Presented at the 2016 North American Meeting of the International Society for Ecological Psychology, Clemson SC.

Jones, J.A., Edewaard, D., Tyrrell, R.A., & Hodges, L.F. (2016, March). *A schematic eye for virtual environments*. Presented at the 2016 IEEE Symposium on 3D User Interfaces, Greenville, SC.

Fekety, D.K., Edewaard, D., Stafford Sewall, A.A., Adams, S., Ormson, T.K., Eddy, B., Moore, P., & Tyrrell, R.A. (2015, October). *Comparative analyses of electroluminescent and retroreflective materials as nighttime pedestrian conspicuity aids*. Presented at the 2015 Annual Meeting of the Human Factors and Ergonomics Society, Los Angeles, CA.

Stafford Sewall, A.A., Whetsel Borzendowski, S.A., Tyrrell, R.A., Stephens, B.R., Rosopa, P.J., Fekety, D.K. (2015, October). *Observers' judgments of the effect of glare on their visual acuity*. Presented at the 2015 Annual Meeting of the Human Factors and Ergonomics Society, Los Angeles, CA.

Whetsel Borzendowski, S.A., Stafford Sewall, A.A., & Tyrrell, R.A. (2015, June). *Using a video-based method to gather real world high beam usage data*. Presented at the 2015 Annual Meeting of the 7th International Symposium on Driving Assessment, Training, and Vehicle Design, Salt Lake City, UT.

Fekety, D.F., & Tyrrell, R.A. (2015, May). A comparative analysis of electroluminescent and retroreflective materials as nighttime conspicuity aids. Invited presentation at Nike, Inc., Portland, OR.

Tyrrell, R.A., & Fekety, D.F. (2015, May). Enhancing the nighttime conspicuity of athletes: Part I. Invited presentation at Nike, Inc., Portland, OR.

Wood, J.M., Tyrrell, R.A., Black, A.A., & Lacherez, P.F. (2015, May). *Exploring the role of biological motion in enhancing night-time pedestrian recognition: Assessment of eye movements*. Presented at the annual meeting of the Association for Research in Vision and Ophthalmology, Denver, CO.

Tyrrell, R.A. (2015, April). *"Meta-perception" and its relevance to the safety of pedestrians at night*. Presented at the annual meeting of the Southern Society for Philosophy and Psychology, New Orleans, LA.

Stafford Sewall, A.A., Whetsel Borzendowski, S.A., Fekety, D.K., & Tyrrell, R.A. (2014, October). *Pedestrians' willingness to seek out, purchase, and wear conspicuity-enhancing athletic garments*. Presented at the 2014 Annual Meeting of the Human Factors and Ergonomics Society, Chicago, IL.

Whetsel Borzendowski, S.A., Stafford Sewall, A.A., Fekety, D.K., & Tyrrell, R.A. (2014, October). *Effects of an educational intervention on athletes' attitudes toward wearing conspicuity-enhancing garments at night*. Presented at the 2014 Annual Meeting of the Human Factors and Ergonomics Society, Chicago, IL.

Tyrrell, R.A. (2014, April). *Seeing and being seen: Studies on the nighttime conspicuity of pedestrians*. Invited presentation to the Department of Psychology at Virginia Tech (Colloquium series).

Fekety, D.K., Whetsel, S.A., Sewall, A.A., & Tyrrell, R.A. (2013, October). *Drivers' beliefs, habits, and strategies regarding high beam usage*. Scheduled for presentation at the 2013 Annual Meeting of the Human Factors and Ergonomics Society, San Diego, CA.

Tyrrell, R.A. (2013, September). *Misperceptions about night vision by drivers and pedestrians*. Presented at The Eye, The Brain, & The Auto 2013, The Sixth Biennial World Research Congress on the Relationship Between Vision and the Safe Operation of a Motorized Vehicle, Dearborn, MI. (Invited speaker.)

Stafford, A.A., Whetsel, S.A., Cartee, N.K., & Tyrrell, R.A., (2012, October). *How accurate are older drivers' judgments of the effects of headlight glare on acuity?* Presented at the 2012 Annual Meeting of the Human Factors and Ergonomics Society, Boston, MA.

***The above paper won the 2012 Best Student Poster Award from HFES' Perception and Performance Technical Group.**

Whetsel, S.A., Stafford, A.A., Rosopa, P.J., & Tyrrell, R.A. (2012, October). *The accuracy of drivers' judgments of the effects of headlight glare on pedestrian recognition at night*. Presented at the 2012 Annual Meeting of the Human Factors and Ergonomics Society, Boston, MA.

Wood, J.M., Tyrrell, R.A., Chaparro, A., Marszalek, R., Carberry, T.P., Chu, B.S. (2012, August). *Visual impairment and drivers' ability to recognize pedestrians at night*. Presented at the 2012 Australasian College of Road Safety National Conference, Sydney, Australia.

Balk, S.A., & Tyrrell, R.A. (2011, September). *The (in)accuracy of estimations of our own visual acuity in the presence of glare*. Presented at the 2011 Annual Meeting of the Human Factors and Ergonomics Society, Las Vegas, NV.

***The above paper won the 2011 Best Student Paper Award from HFES' Perception and Performance Technical Group.**

****The above paper won the 2011 Alphonse Chapanis Best Student Paper Award from HFES.**

Stafford, A.A., Whetsel, S.A., Balk, S.A., Ballou, D.G., & Tyrrell, R.A. (2011, September). *The accuracy of drivers' judgments of the effects of headlight glare on the visibility of a low contrast object*. Presented at the 2011 Annual Meeting of the Human Factors and Ergonomics Society, Las Vegas, NV.

Whetsel, S.A., Rosenberg, R.L., Balk, S.A., & Tyrrell, R.A. (2011, September). *Pedestrians' estimates of their own visibility at night are not reduced when headlights are severely weakened*. Presented at the 2011 Annual Meeting of the Human Factors and Ergonomics Society, Las Vegas, NV.

Balk, S.A., & Tyrrell, R.A. (2011, July). *The accuracy of drivers' judgments of the effects of headlight glare: Are we really blinded by the light?* Presented at the 2011 Meeting of the 6th International Symposium on Driving Assessment, Training, and Vehicle Design, Lake Tahoe, CA.

Crisler, M.C., & Tyrrell, R.A. (2011, January). *Do drivers know that being distracted impairs their ability to respond to events more than their ability to maintain lane position?* Presented at the 2011 Annual Meeting of the Transportation Research Board, Washington, DC.

Wood, J.M., Marszalek, R., Lacherez, P., Tyrrell, R.A., Chaparro, A. (2010, January). *Perceptions of visibility and conspicuity of biomotion clothing configurations for road workers at road work sites*. Presented at the 2010 Annual Meeting of the Transportation Research Board, Washington, D.C.

Wood, J.M., Tyrrell, R.A., Chaparro, A., Marszalek, R., Carberry, T.P., Chu, B.S. (2010, January). *Reduction of Pedestrian Visibility at Night by Modest Visual Impairments and Headlamp Glare*. Presented at the 2010 Annual Meeting of the Transportation Research Board, Washington, D.C.

Tyrrell, R.A. (2009, November). *Seeing and being seen: Studies of vision and meta-perception during night driving*. Invited presentation to the University of Michigan Transportation Research Institute, Ann Arbor, MI.

Brooks, J.O., Goodenough, R.R., Tyrrell, R.A., Guirl, C., Moore, K., Klein, N., Davis, L., Kubala, T. (2009, June). *How well do drivers understand their own headlights?* Presented at the 5th International Symposium on Driver Assessment, Training, and Vehicle Design, Big Sky, MT.

Graving, J.S., Tyrrell, R.A., & Balk, S.A. (2009, June). *Quantifying subjective brightness of retroreflective material using magnitude estimations.* Presented at the 5th International Driving Assessment Symposium on Human Factors in Driver Assessment, Training, and Vehicle Design, Big Sky, MT.

Balk, S.A., Tyrrell, R.A., & Graving, J.S. (2009, May). *Open-road studies of pedestrian conspicuity at night: The robustness of biological motion configurations.* Presented at the 19th Biennial Transportation Research Board Visibility Symposium, Blacksburg, VA.

Wood, J.M., Tyrrell, R.A., Chaparro, A., Marszalek, R.P., Carberry, T.P., & Chu, B.S. (2009, May). *The conspicuity of pedestrians at night: Effects of experimentally induced visual impairments and headlamp glare.* Presented at the 19th Biennial Transportation Research Board Visibility Symposium, Blacksburg, VA.

Graving, J.S., Tyrrell, R.A., Balk, S.A., Mendel, J., Braly, N.M., Sinakhonerath, L., O'Hara, L.H., & Moore, K.S. (2009, May). *The effects of retroreflectivity and biological motion on the visibility of pedestrians at night.* Presented at the 2009 Annual Meeting of the Vision Sciences Society, Naples, FL. Abstract: <http://journalofvision.org/9/8/625/>

Brooks, J.O., & Tyrrell, R.A. (2008, November). *An empirical test of the selective degradation hypothesis.* Presented at the 2008 Annual Meeting of The Gerontological Society of America, National Harbor, MD.

Crisler, M.C., & Tyrrell, R.A. (2008, September). *Using music in spatial audio displays: How well do we localize complex sounds?* Presented at the 2008 Annual Meeting of the Human Factors and Ergonomics Society, New York, NY. Available: *Proceedings of the Human Factors and Ergonomics Society 52nd Annual Meeting*, 1175-1179.

Tyrrell, R.A., Wood, J.M., Chaparro, A., Carberry, T.P., Chu, B.S., & Marszalek, R. (2008, September). *Seeing pedestrians at night: Visual clutter does not mask biological motion.* Presented at the 2008 Annual Meeting of the Human Factors and Ergonomics Society, New York, NY. Available: *Proceedings of the Human Factors and Ergonomics Society 52nd Annual Meeting*, 1840-1844.

Weaver, P.M., Tyrrell, R.A., & Brooks, J.O. (2008, March). *How well do we know our own peripheral acuity?* Presented at the annual meeting of the Southeastern Psychological Association, Charlotte, NC.

Balk, S.A., Graving, J.S., Chanko, R., & Tyrrell, R.A. (2007, October). *Effects of retroreflector placement on the nighttime conspicuity of pedestrians: An open-road study.* Presented at the 2007 Annual Meeting of the Human Factors and Ergonomics Society, Baltimore, MD.

Balk, S.A., Tyrrell, R.A., & Graving, J.S. (2007, August). *Applying Biological Motion: Open-Road Studies of Pedestrian Conspicuity at Night.* Presented at the 2007 Annual Meeting of the American Psychological Association, San Francisco, CA.

Tyrrell, R.A. (2007, July). *Pedestrian conspicuity at night: Seeing and being seen.* Invited presentation at the 2007 Annual Meeting of the Southeastern Collision Reconstruction Conference, Charleston, SC.

Brooks, J.O., Tyrrell, R.A., & Stephens, B.R. (2007, May). *The accuracy of observers' estimates of their ability to see and steer in low luminances.* Presented at the 2007 Annual Meeting of the Vision Sciences Society, Sarasota, FL. Abstract: *Journal of Vision*, 7(9), 246, <http://journalofvision.org/7/9/246/> .

Tyrrell, R.A., Wood, J.M., Chaparro, A., Carberry, T.P., Chu, B.S., & Marszalek, R. (2007, May). *Seeing pedestrians at night: The benefits of biological motion are robust to clutter.* Presented at the 2007 Annual Meeting of the Vision Sciences Society, Sarasota, FL. Abstract: *Journal of Vision*, 7(9), 475, <http://journalofvision.org/7/9/475/> .

Weaver, P.M., Tyrrell, R.A., & Brooks, J.O. (2007, May). *How well do we know our own peripheral acuity?* Presented at the Conference on Applied Psychology, Clemson, SC.

Tyrrell, R.A., Balk, S.A., Switzer, F.S., III, & Brooks, J.O. (2007, January). *Effects of tire pressure monitoring systems on tire pressures in consumer vehicles.* Presented at the 2007 Annual Meeting of the Transportation Research Board, Washington, DC.

Brooks, J.O., Tyrrell, R.A. (2006, October). *Do drivers know they can steer in the dark?: An empirical test of the selective degradation hypothesis.* Presented at the 2006 Annual Meeting of the Human Factors & Ergonomics Society, San Francisco, CA. Available: *Proceedings of the Human Factors and Ergonomics Society 50th Annual Meeting*, 2028-2032.

Brooks, J.O., Tyrrell, R.A., & Stephens, B.R. (2006, October). *Comparing estimated and actual visual acuity at high and low luminance.* Presented at the 2006 Annual Meeting of the Human Factors & Ergonomics Society, San Francisco, CA. Available: *Proceedings of the Human Factors and Ergonomics Society 50th Annual Meeting*, 1721-1725.

Tyrrell, R.A., Beck, C.E., Brooks, J.O., & Owens, D.A. (2006, May). *The accuracy of observers' estimates of their own stereoacuity.* Presented at the 2006 Annual Meeting of the Vision Sciences Society, Sarasota, FL. Abstract: *Journal of Vision*, 6(6), 649a, <http://journalofvision.org/6/6/649/>.

Beck, C.E., & Tyrrell, R.A. (2006, April). *How well do we know our own stereoacuity?* Presented at the 1st Annual ACC Meeting of the Minds Conference, Clemson, SC.

Balk, S.A., & Tyrrell, R.A. (2006, April). *Pedestrian conspicuity at night: How much biological motion is enough?* Presented at Focus on Research and Graduate Education - South Carolina (FORGE-SC) in the South Carolina State Capital Building, Columbia, SC.

Balk, S.A., Carpenter, T.L., Brooks, J.O., & Tyrrell, R.A. (2006, January). *Pedestrian conspicuity at night: How much biological motion is enough?* Presented at the 2006 Annual Meeting of the Transportation Research Board, Washington, D.C.

Beck, C.E., & Tyrrell, R.A. (2005, August). *How well do we know our own stereoacuity?* Presented at the Conference on Applied Psychology, Clemson, SC.

Balk, S.A., Carpenter, T.L., Brooks, J.O., Rubinstein, J.S., & Tyrrell, R.A. (2005, May). *The conspicuity of pedestrians at night: How much biological motion is enough?* Presented at the 2005 Annual Meeting of the Vision Sciences Society, Sarasota, FL.

Brooks, J.O., Tyrrell, R.A., Wood, J.M., Stephens, B.R., & Stavrou, E.P. (2005, May). *Comparing estimated and actual visual acuity at high and low luminance.* Presented at the 2005 Annual Meeting of the Vision Sciences Society, Sarasota, FL.

Moss, J.D., Muth, E.R., Stephens, B.R., & Tyrrell, R.A. (2005, May). *Human perceptual visual stimulus lag detection thresholds in "real" visual scene.* Presented at the 2005 Annual Meeting of the Aerospace Medical Association, Kansas City, KS.

Odom, M., Tyrrell, R.A., Brooks, J.O., & Muth, E.R. (2005, April). *The effects of luminance on the useful field of view.* Presented at the 2005 meeting of the Southeastern Psychological Association, Nashville, TN.

Tyrrell, R.A., & Brooks, J.O. (2004, October). *Human Factors Psychology Applied to Pedestrians: Seeing and Being Seen.* Invited presentation at the 2004 South Carolina Bicycle & Pedestrian Accommodations Conference, Myrtle Beach, SC.

Tyrrell, R.A. (2004, September). *Illuminating Drivers' Misunderstandings of Their Own Visual Abilities*. Invited presentation to the SAE Lighting Forum "Glare – Human Factors Perspectives," a Forum organized by the Society of Automotive Engineers, New Orleans, LA.

Brooks, J.O., Tyrrell, R.A., Frank, T.A., & Isenhower, R.W. (2004, September). *Effects of Visual Challenges on Steering Ability: Testing the Selective Degradation Hypothesis*. Presented at the 48th Annual Meeting of the Human Factors and Ergonomics Society, New Orleans, LA. Available: *Proceedings of the Human Factors and Ergonomics Society 48th Annual Meeting*, 2364-2368.

Odom, M., & Tyrrell, R.A., & Muth, E.R. (2004, August). *The effects of luminance on the useful field of view*. Presented at the Conference on Applied Psychology, Clemson, SC.

Brooks, J.O., Frank, T.A., Isenhower, R.W., Klein, N.D., Addison, J., & Tyrrell, R.A. (2004, May). *Steering performance in challenging visual conditions: Testing the selective degradation hypothesis*. Presented at the 2004 Annual Meeting of the Visual Sciences Society, Sarasota, FL.

Tyrrell, R.A., Gugerty, L., Aten, T.R., & Edmonds, K.A. (2004, May). *The effects of sub-pixel addressing on users' performance and preferences during reading-related tasks*. Presented at the 2004 Annual Meeting of the Visual Sciences Society, Sarasota, FL.

Duchowski, A.T., Cournia, N., Cumming, B., McCallum, D., Gramopadhye, A., Greenstein, J., Sadasivan, S., & Tyrrell, R.A. (2004, March). *Visual deictic reference in a collaborative virtual environment*. Presented at the 2004 Annual Meeting of Eye Tracking Research and Applications, San Antonio, TX.

Tyrrell, R.A., Brooks, J.O., Wood, J.M., & Carberry, T.P. (2004, January). *Nighttime Conspicuity from the pedestrian's perspective*. Presented at the 2004 Annual Meeting of the Transportation Research Board, Washington, D.C.

Tyrrell, R.A. (2003, November). *Human Factors Psychology applied to driving: Let's not forget the driver*. Invited presentation at the "Celebrate Research" event at Clemson University, Clemson, SC.

Edmonds, K.A., Stephenson, A.K., Gugerty, L.J., & Tyrrell, R.A. (2003, October). *ClearType increases users' performance on a sentence comprehension task*. Presented at the 2003 Annual Meeting of the Human Factors & Ergonomics Society, Denver, CO.

Tyrrell, R.A., Wood, J.M., & Carberry, T.P. (2003, October). *On-Road Measures of the nighttime conspicuity of pedestrians: Effects of clothing, beam, and driver age*. Presented at the 2003 Annual Meeting of the Human Factors & Ergonomics Society, Denver, CO.

Brooks, J.O., Owens, J.M., Stephens, B.R., & Tyrrell, R.A. (2003, May). *How well do we know our own visual limitations? Comparisons of estimated and actual visual abilities*. Presentation at the 2003 annual meeting of the Vision Sciences Society.

Tyrrell, R.A., Wood, J.M., Carberry, T.P., Faulks, T., & Jones, K. (2003, May). *On-road measures of the visibility of pedestrians at night*. Presentation at the 2003 annual meeting of the Vision Sciences Society.

Tyrrell, R.A., Wood, J.M., and Carberry, T. (2003, January). *On-road measures of pedestrians' estimates of their own nighttime visibility: Effects of clothing, beam, and age*. Presented at the 81st Annual Meeting of the Transportation Research Board, Washington, D.C..

Wood, J.M., Tyrrell, R.A., and Carberry, T. (2003, January). *Pedestrian visibility at night: Effects of pedestrian clothing, driver age, and headlamp beam setting*. Presented at the 81st Annual Meeting of the Transportation Research Board, Washington, D.C..

Aten, T., Gugerty, L., & Tyrrell, R.A. (2002, October). Legibility of words rendered using ClearType™. Presented at the 2002 Annual Meeting of the Human Factors and Ergonomics Society, Baltimore, MD. Abstract: *Proceedings of the Human Factors and Ergonomics Society, 46th Annual Meeting*, 1684-1687.

Brooks, J.O., Tyrrell, R.A., & Olson, H.M. (2002, January). *Pedestrian visibility at night: Evaluating a method of teaching young drivers to be safer pedestrians*. Presentation at the 2002 Annual Meeting of the Transportation Research Board, Washington, D.C.

Tyrrell, R.A., Pasquale, T.B., Aten, T., & Francis, E.L. (2001, June). *Empirical evaluation of user responses to reading text rendered using ClearType technologies*. Presentation at the 2001 Annual Meeting of the Society for Information Display, San Jose, CA.

Tyrrell, R.A., & Patton, C.W. (2000, June). *The nighttime visibility of pedestrians: The pedestrians' perspective*. Presented at the 2000 Meeting of the International Society for Ecological Psychology, Clemson, SC.

Tyrrell, R.A., & Patton, C.W. (2000, January). *Using education to influence pedestrians' estimates of their own nighttime visibility*. Presented at the 79th Annual Meeting of the Transportation Research Board, Washington, D.C.

Tyrrell, R.A., & Patton, C.W. (1999, June). *Applying Leibowitz: Educating pedestrians about their own nighttime visibility*. Presented at the Festschrift Conference in Honor of Herschel W. Leibowitz, State College, PA.

Marsh, D.K., & Tyrrell, R.A. (1998, October). *Brightness and detectability of commercially available colored retroreflective materials at night*. Presented at the 42nd Annual Meeting of the Human Factors & Ergonomics Society, Chicago, IL. Abstract: *Proceedings of the Human Factors and Ergonomics Society*, 1633.

Tyrrell, R.A., & Patton, C.W. (1998, October). *The effectiveness of educating pedestrians about their own nighttime visibility*. Presented at the 42nd Annual Meeting of the Human Factors & Ergonomics Society, Chicago, IL.

Tyrrell, R.A., Pearson, M.A., & Thayer, J.F. (1997, October). *Adaptation of oculomotor resting states depends on autonomic demands*. Presentation at the 1997 annual meeting of the Society for Psychophysiological Research, Cape Cod, MA. Abstract: *Psychophysiology*, 34, S90.

Tyrrell, R.A., Pearson, M.A., & Andre, J.T. (1997, July). *The visual guidance of blind walking: Information and individual differences*. Presented at the Ninth International Conference on Perception and Action, Toronto, Canada.

Patton, C.W., Allen, D.K., Bundrick, C.L., Littleton, H.L., Sloan, P.A., & Tyrrell, R.A. (1997, April). *Pedestrian estimations of their own visibility under different nighttime conditions*. Presented at the 1997 annual meeting of the Southeastern Psychological Association, Atlanta, GA.

Tyrrell, R.A. (1996, September). *Behavioral links between the oculomotor and cardiovascular systems*. Invited presentation at the First International Symposium on Accommodation/Vergence Mechanisms in the Visual System, Stockholm, Sweden.

Pearson, M.A., Tyrrell, R.A., Thayer, J.F., & Jiang, B.C. (1996, April). *Adaptation of oculomotor resting states depends on both task and refractive status*. Presented at the 1996 Annual Meeting of the Association for Research in Vision and Ophthalmology, Ft. Lauderdale, FL. Abstract: *Investigative Ophthalmology & Visual Science*, 37 (3), S166.

Nicholson, M. W., Wang, M. Q., Mahoney, B. S., Andre, J. T., Tyrrell, R. A., & Leibowitz, H. W. (1995, October). *Effects of alcohol on visual contrast sensitivity*. Presented at the 1995 Annual Meeting of the American Public Health Association, Washington, DC

Tyrrell, R. A. (1995, August). *The visual guidance of locomotion: Information and individual differences*. Invited address at the 1995 Annual Meeting of the American Psychological Association, New York, NY.

Pearson, M. A., & Tyrrell, R. A. (1995, March). *Individual differences in the persistence of visual guidance information*. Presented at the 1995 Annual Meeting of the Southeastern Psychological Association, Savannah, GA.

Owens, D. A., & Tyrrell, R. A. (1995, January). *Age-related variations in nighttime vehicle guidance: An extension of the selective degradation hypothesis*. Invited address at the 1995 Annual Meeting of the National Research Council's Transportation Research Board, Washington, D. C.

Tyrrell, R. A., Thayer, J. F., & Leibowitz, H. W. (1994, October). *The Eye-Heart Link: Behavioral Covariations between the Oculomotor and Cardiovascular Systems*. Presented at the 1994 Annual Meeting of the Society for Psychophysiological Research, Atlanta, GA. Abstract: *Psychophysiology*, 31, S99.

Tyrrell, R. A., & Thayer, J. F. (1994, April). *Visually induced cardiovascular changes*. Presented at the 1994 Annual Meeting of the American Psychosomatic Society, Boston, MA. Abstract: *Psychosomatic Medicine*, 56, 169.

Tyrrell, R. A., Thayer, J. F., & Leibowitz, H. W. (1994, May). *Cardiovascular changes covary with oculomotor adaptation induced by near work*. Presented at the 1994 Annual Meeting of the Association for Research in Vision and Ophthalmology, Sarasota, FL. Abstract: *Investigative Ophthalmology & Visual Science*, 35 (4), 1282.

Andre, J. T., Tyrrell, R. A., Boonie, K. K., Leibowitz, H. W., & Owens, D. A. (1993, May). *Target motion exacerbates the effect of night myopia on contrast sensitivity*. Presented at the 1993 Annual Meeting of the Association for Research in Vision and Ophthalmology, Sarasota, FL. Abstract: *Investigative Ophthalmology & Visual Science*, 34 (4), 1311.

Friedman, B. H., Thayer, J. F., Borkovec, T. D., Cheek, M., Muth, E. R., Tyrrell, R. A., & Colombo, R. (1993, March). *Nonlinear dynamical systems approaches to physiological assessment of anxiety*. Presented at the 1993 Annual Meeting of the American Psychosomatic Society, Charleston, SC. Abstract: *Psychosomatic Medicine*, 55, 113.

Owens, D. A., & Tyrrell, R. A. (1993, May). *Visual guidance performance of younger and older drivers under challenging conditions*. Presented at the 1993 Annual Meeting of the Association for Research in Vision and Ophthalmology, Sarasota, FL. Abstract: *Investigative Ophthalmology & Visual Science*, 34 (4), 1418.

Nicholson, M. E., Wang, M. Q., Andre, J. T., Tyrrell, R. A., & Leibowitz, H. W. (1993, October). *Effects of moderate dose alcohol on contrast sensitivity: Public safety implications*. Presented at the American Public Health Association, San Francisco, CA.

Tyrrell, R. A. (1993, January). *A report of recent findings from a vision laboratory that are relevant to traffic safety*. Invited address to the Medical Advisory Board of the Pennsylvania Department of Transportation, Harrisburg, PA.

Tyrrell, R. A., Andre, J.T., Boonie, K. K., Peasley, C. E., & Leibowitz, H. W. (1993, May). *On the visual information that supports blind walking*. Presented at the 1993 Annual Meeting of the Association for Research in Vision and Ophthalmology, Sarasota, FL. Abstract: *Investigative Ophthalmology & Visual Science*, 34 (4), 1418.

Tyrrell, R. A., Thayer, J. F., Friedman, B. H., Leibowitz, H. W., & Francis, E. L. (1993, March). *The ANS links oculomotor and cardiovascular activity and suggests a mechanism for visually induced cardiovascular stress*. Presented at the 1993 Annual Meeting of the American Psychosomatic Society, Charleston, SC. Abstract: *Psychosomatic Medicine*, 55, 109-110.

Andre, J. T., Tyrrell, R. A., Nicholson, M. E., Wang, M., & Leibowitz, H. W. (1992, May). *Measuring and predicting the effects of alcohol on contrast sensitivity for static and dynamic gratings*. Presented to the Association for Research in Vision and Ophthalmology, Sarasota, FL. Abstract: *Investigative Ophthalmology & Visual Science*, 33 (4), 1416.

- Friedman, B. H., Thayer, J. F., Tyrrell, R. A., Borkovec, T. D., & Columbo, R. (1992). Autonomic control of cardiac chronotropic regulatory mechanisms and anxiety. *Psychophysiology*, *29*, S32.
- Leibowitz, H. W., Andre, J. T., Tyrrell, R. A., Hewitt, F. G., Cavanagh, P. R., & Simoneau, G. G. (1992, May). *Contrast sensitivity during locomotion: The effect of alcohol*. Presented to the Association for Research in Vision and Ophthalmology, Sarasota, FL. Abstract: *Investigative Ophthalmology & Visual Science*, *33* (4), 1415.
- Nicholson, M. E., Wang, M. Q., Mahoney, B. S., Leibowitz, H., Andre, J. T., & Tyrrell, R. A. (1992, November). *Alcohol and visual impairment: Safety and policy issues*. Presented to the American Public Health Association, Washington, D. C.
- Tyrrell, R. A., Andre, J. T., Leibowitz, H. W., & Nicholson, M. E. (1992, March). *Measuring and predicting the effects of alcohol ingestion on static and dynamic contrast sensitivity*. Presented at seminar on Human Factors in Transportation Safety seminar at University of Michigan Transportation Research Institute, Ann Arbor, MI.
- Tyrrell, R. A., Thayer, J. F., Friedman, B. H., Leibowitz, H. W., & Francis, E. L. (1992, May). *A link between autonomic innervations to the oculomotor and cardiovascular systems*. Presented to the Association for Research in Vision and Ophthalmology, Sarasota, FL. Abstract: *Investigative Ophthalmology & Visual Science*, *33* (4), 1149.
- Leibowitz, H. W., Tyrrell, R. A., & Rudolph, K. K. (1991, August). *The persistence of visual guidance cues*. Accepted for presentation to European Conference on Visual Perception, Vilnius, Lithuania. (Conference cancelled due to coup.)
- Simoneau, G. G., Cavanagh, P. R., Ulbrecht, J. S., Leibowitz, H. W., & Tyrrell, R. A. (1991, February). *The influence of visual factors on postural sway parameters in the elderly*. Presented at the American Physical Therapy Association meeting, Orlando, FL.
- Simoneau, G. G., Leibowitz, H. W., Cavanagh, P. R., Ulbrecht, J. S., & Tyrrell, R. A. (1991, November). *How visual conditions relate to safety in daily locomotion activities*. Presented at the Gerontology Society meeting, San Francisco, CA.
- Thayer, J. F., Friedman, B. H., & Tyrrell, R. A. (1991). Spectral analysis of heart rate during shock avoidance and cold face stress: Evidence for the spectral reserve hypothesis. *Psychophysiology*, *28*, S56.
- Tyrrell, R. A., Daniels, C. M., Andre, J. T., Lundy, D. H., Eggers, B. G., & Leibowitz, H. W. (1991, May). *The effects of time and eye movements on pointing performance*. Presented to the Association for Research in Vision and Ophthalmology, Sarasota, FL. Abstract: *Investigative Ophthalmology & Visual Science*, *32* (4), 1272.
- Tyrrell, R. A. (1991, May). *Vergence effort and prolonged work*. Presented to the meeting of the Society for Information Display, Anaheim, CA (Invited lecture).
- Tyrrell, R. A. (1991, October). *Vision and the Mature Driver*. Presented to the Keystone Mature Driver's Task Force Conference "Mobility & Safety: The Mature Driver's Challenge," Carlisle, PA.
- Eggers, B. G., Tyrrell, R. A., & Leibowitz, H. W. (1990). *The effects of glare on static and dynamic contrast thresholds*. Presented to the Association for Research in Vision and Ophthalmology, Sarasota, FL. Abstract: *Investigative Ophthalmology & Visual Science*, *31* (4), 324.
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