APPENDIX L. MEANS TABLES

TABLE L-1 Time to Collision (seconds)

	Strobe	No Strobe	Age Range Mean
Younger	3.17 (n=8)	2.93 (n=9)	3.04 (n=17)
Older	2.92 (n=8)	2.96 (n=8)	2.94 (n=16)
Condition Mean	3.05 (n=16)	2.94 (n=17)	Grand Mean
			2.99 (n=33)

TABLE L-2 Velocities at the time the surrogate vehicle first appeared (mph)

	Strobe	No Strobe	Age Range Mean
Younger	26.07 (n=8)	26.07 (n=9)	26.37 (n=17)
Older	26.34 (n=8)	26.06 (n=8)	26.20 (n=16)
Condition Mean	26.52 (n=16)	26.07 (n=17)	Grand Mean
			26.29 (n=33)

TABLE L-3. First response time (seconds)

	Strobe	No Strobe	Age Range Mean
Younger	0.20 (n=8)	0.15 (n=6)	0.18 (n=14)
Older	0.20 (n=6)	0.27 (n=7)	0.24 (n=14)
Condition Mean	0.20 (n=14)	0.22 (n=13)	Grand Mean
			0.21 (n=28)

TABLE L-4 Perception response time (seconds)

	Strobe	No Strobe	Age Range Mean
Younger	0.71 (n=8)	0.75 (n=9)	0.74 (n=17)
Older	0.74 (n=8)	0.70 (n=8)	0.72 (n=16)
Condition Mean	0.73 (n=16)	0.73 (n=17)	Grand Mean
			0.73 (n=33)

TABLEL-5 Time to brake press (seconds)

	Strobe	No Strobe	Age Range Mean
Younger	0.73 (n=8)	0.76 (n=9)	0.74 (n=17)
Older	0.75 (n=8)	0.70 (n=8)	0.73 (n=16)
Condition Mean	0.74 (n=16)	0.73 (n=17)	Grand Mean
			0.73 (n=33)

TABLE L-6 Brake movement time (seconds)

	Strobe	No Strobe	Age Range Mean
Younger	0.64 (n=8)	0.61 (n=9)	0.62 (n=17)
Older	0.35 (n=8)	0.54 (n=8)	0.44 (n=16)
Condition Mean	0.49 (n=16)	0.58 (n=17)	Grand Mean
			0.54 (n=33)

TABLE L-7 Time to steer (seconds)

	Strobe	No Strobe	Age Range Mean
Younger	1.13 (n=3)	1.33 (n=3)	1.23 (n=6)
Older	0.93 (n=6)	1.02 (n=5)	0.97 (n=11)
Condition Mean	1.00 (n=9)	1.14 (n=8)	Grand Mean
			1.06 (n=17)

TABLE L-8. Steering response time (seconds)

	Strobe	No Strobe	Age Range Mean
Younger	0.50 (n=3)	0.83 (n=3)	0.67 (n=6)
Older	0.35 (n=6)	0.54 (n=5)	0.44 (n=11)
Condition Mean	040 (n=9)	0.65 (n=8)	Grand Mean
			0.52 (n=17)

TABLE L-9 Steering movement time (seconds)

	Strobe	No Strobe	Age Range Mean
Younger	1.5 (n=3)	1.43 (n=3)	1.47 (n=6)
Older	2 (n=6)	1.88 (n=5)	1.95 (n=11)
Condition Mean	1.83 (n=9)	1.71 (n=8)	Grand Mean
			1.78 (n=17)

TABLE L-10 Maximum Brake Press (percentage)

	Strobe	No Strobe	Age Range Mean
Younger	59.75 (n=8)	61.89 (n=9)	60.88 (n=17)
Older	62.13 (n=8)	59.13 (n=8)	60.63 (n=16)
Condition Mean	60.94 (n=16)	60.59 (n=17)	Grand Mean
			60.76 (n=33)

TABLE L-11 Maximum steering deviation (degrees)

	Strobe	No Strobe	Age Range Mean
Younger	49.97 (n=3)	32.84 (n=3)	41.41 (n=6)
Older	46.38 (n=6)	29.89 (n=5)	38.88 (n=11)
Condition Mean	47.57 (n=9)	31 (n=8)	Grand Mean
			39.77 (n=17)

TABLE L-12 Surrogate visible to full stop (seconds).

	Strobe	No Strobe	Age Range Mean
Younger	4.24 (n=4)	5.21 (n=6)	4.77 (n=10)
Older	4.80 (n=2)	4.40 (n=6)	4.56 (n=18)
Condition Mean	4.40 (n=6)	4.94 (n=12)	Grand Mean
			4.71 (n=16)

TABLE L-13 Subjects final stopping distance (feet).

	Strobe	No Strobe	Age Range Mean
Younger	31.42 (n=5)	14.87 (n=6)	22.39 (n=11)
Older	21.8 (n=2)	22.93 (n=3)	22.48 (n=5)
Condition Mean	28.67 (n=7)	17.56 (n=9)	Grand Mean
			22.42 (n=16)

APPENDIX M. ANOVA SUMMARY TABLES

TABLE M-1. Dependent variable: TTC

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	0.08311301	0.08311301	0.69	0.4143
AGERANGE	1	0.08717117	0.08717117	0.72	0.4033
COND*AGERANGE	1	0.16663673	0.16663673	1.38	0.2505
Error	29	3.51398804	0.12117200		
Corrected Total	32	3.84629352			

TABLE M-2. Dependent Variable: VELOCITY

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	1.70560063	1.70560063	1.02	0.3211
AGERANGE	1	0.28459063	0.28459063	0.17	0.6831
COND*AGERANGE	1	0.23858349	0.23858349	0.14	0.7085 Error
29	48.53149722	1.67349990			
Corrected Total	32	50.74520606			

TABLE M-3. Dependent Variable: Perception time

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	0.00067063	0.00067063	0.02	0.8800
AGERANGE	1	0.02867063	0.02867063	0.99	0.3276
COND*AGERANGE	**1**	**0.14781349**	**0.14781349**	**5.11**	**0.0314**
Error	29	0.83847222	0.02891284		
Corrected Total	32	1.02060606			

TABLE M-4. Dependent variable: First response time

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	0.00076379	0.00076379	0.08	0.7844
AGERANGE	1	0.02452617	0.02452617	2.46	0.1304
COND*AGERANGE	1	0.02452617	0.02452617	2.46	0.1304
Error	23	0.22928571	0.00996894		
Corrected Total	26	0.27851852			

TABLE M-5. Dependent Variable: Perception Response Time

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	0.00006349	0.00006349	0.00	0.9558
AGERANGE	1	0.00192063	0.00192063	0.09	0.7608
COND*AGERANGE	1	0.01334921	0.01334921	0.66	0.4244
Error	29	0.58972222	0.02033525		
Corrected Total	32	0.60545455			

TABLE M-6. Dependent Variable: Time to brake press

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	0.00077778	0.00077778	0.04	0.8521
AGERANGE	1	0.00192063	0.00192063	0.09	0.7696
COND*AGERANGE	1	0.01334921	0.01334921	0.61	0.4420 Error
29	0.63722222	0.02197318			
Corrected Total	32	0.65333333			

TABLE M-7. Dependent Variable: Brake Response Time

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	0.00093336	0.00093336	0.10	0.7559
AGERANGE	1	0.01551362	0.01551362	1.64	0.2122
COND*AGERANGE	**1**	**0.03804676**	**0.03804676**	**4.03**	**0.0561**
Error	24	0.22660714	0.00944196		
Corrected Total	27	0.27857143			

TABLE M-8. Dependent Variable: Brake movement time

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	0.05339683	0.05339683	0.30	0.5897
AGERANGE	1	0.26825397	0.26825397	1.49	0.2314
COND*AGERANGE	1	0.09411111	0.09411111	0.52	0.4749
Error	29	5.20638889	0.17953065		
Corrected Total	32	5.61636364			

TABLE M-9. Dependent Variable: Time to steer

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	0.07952688	0.07952688	0.60	0.4539
AGERANGE	1	0.25501075	0.25501075	1.91	0.1901
COND*AGERANGE	1	0.01243011	0.01243011	0.09	0.7650
Error	13	1.73466667	0.13343590		
Corrected Total	16	2.07882353			

TABLE M-10: Steering Response Time

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	0.26504301	0.26504301	1.37	0.2627
AGERANGE	1	0.19020430	0.19020430	0.98	0.3394
COND*AGERANGE	1	0.01988172	0.01988172	0.10	0.7536
Error	13	2.51366667	0.19335897		
Corrected Total	16	2.98470588			

TABLE M-11 Dependent Variable: Steering Movement Time

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	0.03372043	0.03372043	0.03	0.8675
AGERANGE	1	0.86726882	0.86726882	0.74	0.4037
COND*AGERANGE	1	0.00275269	0.00275269	0.00	0.9620
Error	13	15.13466667	1.16420513		
Corrected Total	16	16.07058824			

TABLE M-12. Dependent Variable: Maximum Brake Press

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	1.52539683	1.52539683	0.01	0.9219
AGERANGE	1	0.31111111	0.31111111	0.00	0.9647
COND*AGERANGE	1	54.32539683	54.32539683	0.35	0.5594
Error	29	4518.13888889	155.79789272		
Corrected Total	32	4574.06060606			

TABLE M-13 Dependent Variable: Maximum Steering Deviation

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	1093.51763710	1093.51763710	1.34	0.2674
AGERANGE	1	41.45518548	41.45518548	0.05	0.8250
COND*AGERANGE	1	0.40260484	0.40260484	0.00	0.9826 Error
13	10588.36015000	814.48924231			
Corrected Total	16	11794.38290588			

TABLE M-14 Dependent Variable: Rate of Steering

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	7930.87773541	7930.87773541	2.20	0.1622
AGERANGE	1	752.08908702	752.08908702	0.21	0.6557
COND*AGERANGE	1	1068.84189038	1068.84189038	0.30	0.5956 Error
13	46947.26107963	3611.32777536			
Corrected Total	16	59710.96455152			

TABLE M-15 Dependent Variable: SVTOFSTP

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	0.27712037	0.27712037	0.36	0.5580
AGERANGE	1	0.05489815	0.05489815	0.07	0.7931
COND*AGERANGE	1	1.57934259	1.57934259	2.07	0.1759
Error	12	9.16033333	0.76336111		
Corrected Total	15	12.10937500			

TABLE M-16 Dependent variable: Subjects final stopping distance

Source	DF	Type III SS	Mean Square	F Value	Pr > F
COND	1	198.14700000	198.14700000	1.61	0.2282
AGERANGE	1	2.01070370	2.01070370	0.02	0.9003
COND*AGERANGE	1	260.68181481	260.68181481	2.12	0.1709
Error	12	1474.32800000	122.86066667		
Corrected Total	15	2223.20437500			

APPENDIX N. LS MEANS TABLES TO ASSESS SIMPLE EFFECTS

TABLE N-1. Least Squares Means COND*AGERANGE Effect Sliced by AGERANGE for Perception Time

AGERANGE	DF	Sum of Squares	Mean Squares	F Value	Pr > F
Older	1	0.062500	0.062500	2.1617	0.1523
Younger	**1**	**0.086675**	**0.086675**	**2.9978**	**0.0940**

TABLE N-2. Least Squares Means COND*AGERANGE Effect Sliced by COND for Perception Time

COND	DF	Sum of Squares	Mean Squares	F Value	Pr > F
No Strobe	**1**	**0.157851**	**0.157851**	**5.4596**	**0.0266**
Strobe	1	0.022500	0.022500	0.7782	0.3849

TABLE N-3. Least Squares Means COND*AGERANGE Effect Sliced by AGERANGE for Brake Response Time

AGERANGE	DF	Sum of Squares	Mean Squares	F Value	Pr > F
Older	1	0.025714	0.025714	2.7234	0.1119
Younger	1	0.013393	0.013393	1.4184	0.2453

TABLE N-4. Least Squares Means COND*AGERANGE Effect Sliced by COND for Brake Response Time

COND	DF	Sum of Squares	Mean Squares	F Value	Pr > F
No Strobe	**1**	**0.047637**	**0.047637**	**5.0453**	**0.0342**
Strobe	1	0.002679	0.002679	0.2837	0.5992

APPENDIX O. GRAPHS OF RATINGS PROVIDED BY SUBJECTS

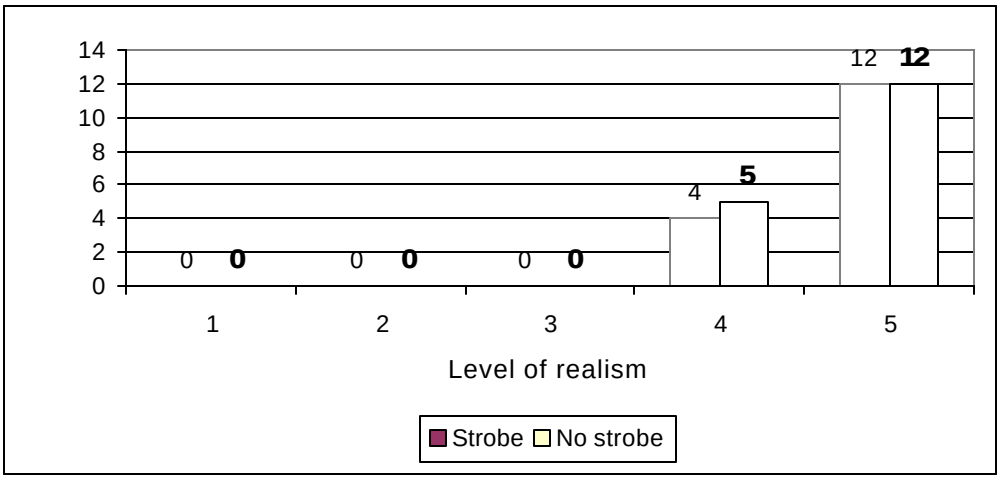

Figure O-1. Ratings concerning level of Realism experienced by subjects

Key:
1: Not at all realistic
2: Slightly realistic
3: Moderately realistic
4: Very realistic
5: Extremely realistic

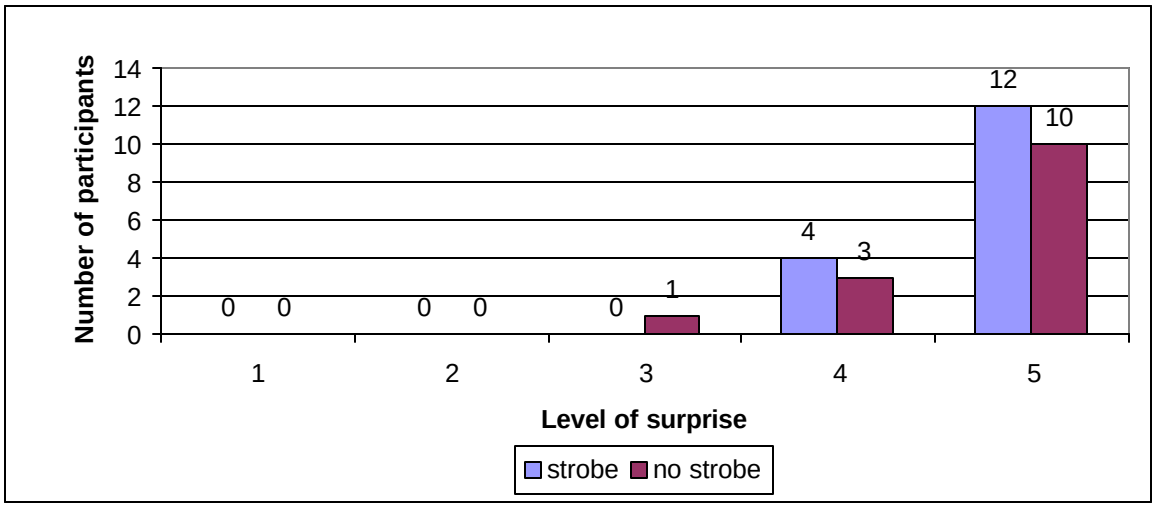

Figure O-2. Ratings concerning level of surprise experienced by subjects

Key:
1: Not at all surprised
2: Slightly surprised
3: Moderately surprised
4: Very surprised
5: Extremely surprised

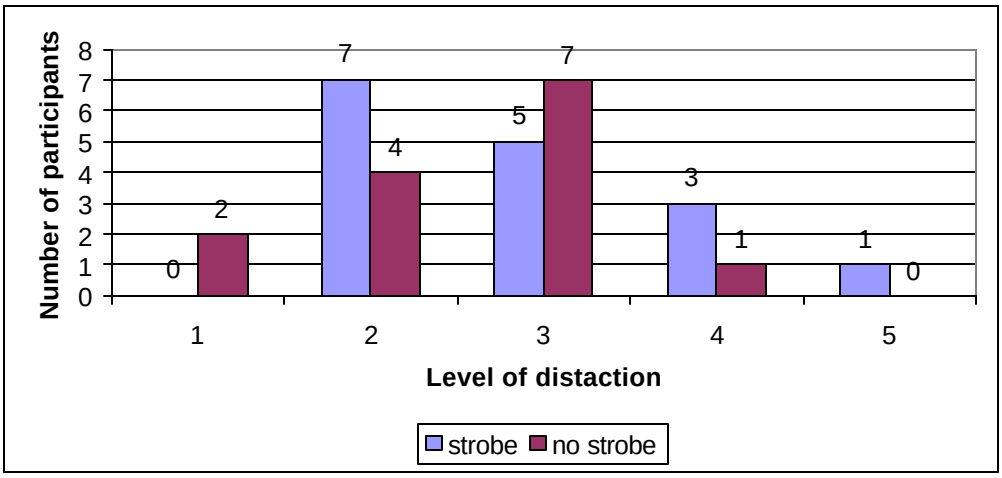

Figure O-3. Ratings concerning level of distraction experienced by subjects

Key:
1: Not at all distracted
2: Slightly distracted
3: Moderately distracted
4: Very distracted
5: Extremely distracted

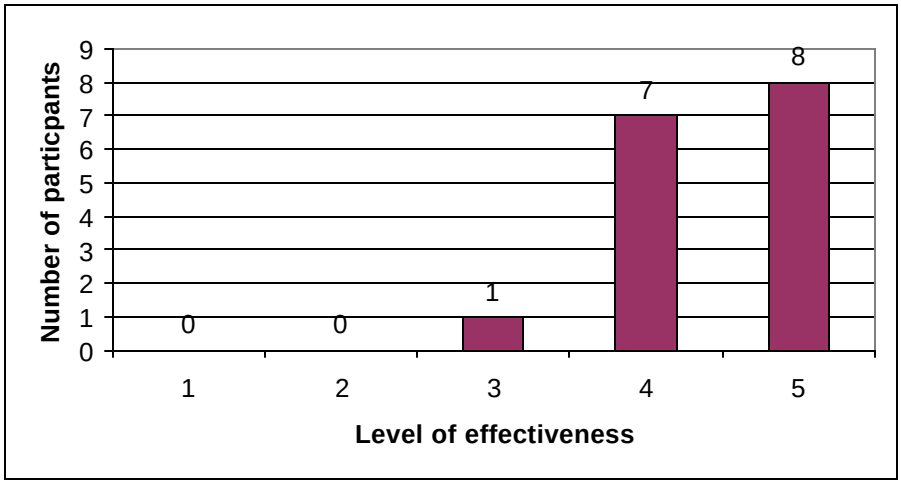

Figure O-4. Ratings concerning level of effectiveness of the strobe signal as a warning

Key:
1: Not at all effective
2: Slightly effective
3: Moderately effective
4: Very effective
5: Extremely effective

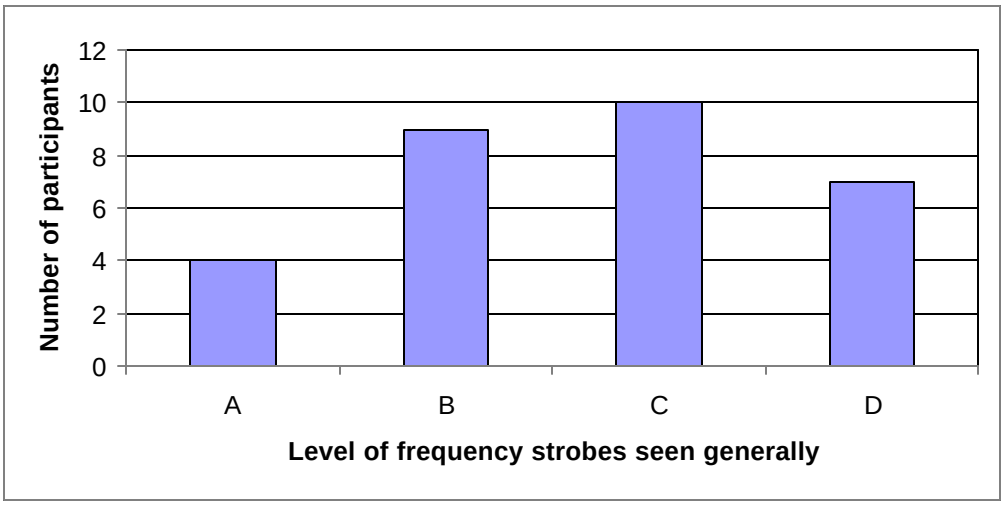

Figure O-5. Subject choice in multi choice question concerning familiarity of strobe lights

A. Very Frequently, every day
B. Frequently, more than once a week
C. Infrequently, a few times per month
D. Very infrequently, a few times per year

APPENDIX P: FREE RESPONSES

Question: Please Explain your Answer (to rating of realism)

- Because I was convinced I was doing a comfort study on distance, and was worried about keeping the correct distance instead of other vehicles on the road besides the van I was following.
- I didn't really think, I just hit the brakes as soon as I saw the car.
- I usually swerve to avoid things in the road while braking moderately, so as not to lock up my brakes (as can occur when braking heavily)
- I thought it was an actual vehicle that had got on the track.
- I felt automatic doing what I did.
- I was 100% taken in by the experiment
- See above. When confronted with the stopped vehicle situation and since I was focused on the distance between me and the van - my reaction was not to follow the van but to STOP. Since I knew I was on the road alone, I was not concerned about vehicle being behind me - which in a regular traffic situation I would have watched for as well.
- See above. I am a defensive driver. Swerving seemed more appropriate, given my knowledge of the situation, than braking.
- I did what had to be done to avoid the stopped vehicle.
- I was not comfortable at the 24 feet following distance (too close). My braking reaction was immediate upon the flashing light.
- I was not expecting the stopped vehicle and reacted as I think I would in a real situation.
- Rapid heart rate, intense breathing
- I believe I reacted exactly how I would have in an actual situation.
- It is a realistic situation that you would see in a congested area. The car in front swerves into the left lane to avoid a stopped car.
- The reaction I had was the same if I had been driving my own vehicle.
- I believe I would have reacted in the same manner in a real situation.
- I did what I would have done in traffic
- If there are clear lanes side of the lane I am driving in, I'll swerve to avoid a stopped vehicle.
- I did not know that it was not a real situation until after I stopped.
- The van swerved, and there was the stopped car (Just as it would be out on the highway), the car in front of you swerves to miss a stopped or slow vehicle, then you are forced to react quickly.
- I looked down and suddenly realized something was in front of me - so I slammed on my brakes.
- I stopped so immediately that there was no time to do any worrying.
- At the moment of seeing the stopped obstruction then relaxed a bit. It was a bit ?? With 10 vehicle swerves before the reality.
- The stopped vehicle was unexpected and thus a surprise - thus unrealistic.
- I lived in Northern Virginia for 30 years, traffic is heavy. People are always stopping in front of you.
- At that point, I forgot I was in the study. I actually thought there might have been a mistake with the study. Why was that car there?
- It would have been the same reflex in an actual traffic situation

- I hit the brakes and pulled to the shoulder. Just as I would have in the real world.
- I would have reacted in the same manner
- Since there were no cars behind me I stopped. A stopped car = no motion = no crash. Had there been cars behind me I would have swerved right.
- When come upon or see something unexpected tried to brake and swerve to miss vehicle
- I was not expecting the stopped vehicle at all and thought that somehow it got on the road by mistake. All I could think of was trying to avoid a collision.
- The sequence I followed (brake first, then steer if necessary) is what I would typically do. The only difference between this situation and real life was my knowledge that I did not have to look in the rear view mirror, since no vehicle would be following me.

APPENDIX Q. FREE RESPONSES

Question: What First Alerted you to the Presence of the Stopped Vehicle

Strobe Responses

- The strobe light
- Seeing it appear - the car itself. I don't recall if I even saw the strobe before I braked.
- When the lead van moved - I recognized the light first.
- Strobe light
- Light and the vehicle itself.
- I don't know which I noticed first, the vehicle itself or the strobe.
- Action of the van and then the strobe light - the strobe light is what made me hit the brakes - the van had been doing the erratic turns as part of the course.
- When I first caught a glimpse of it when the lead vehicle swerved.
- The flashing light
- The blinking light.
- Just remember seeing the whole rear end of the vehicle - Not sure if there was any one thing that got my attention. I do remember seeing the light. (He called later and said that the light definitely alerted him)
- Light. I did not see the vehicle until I had stopped.
- The strobe light caught my attention as something "wrong" ahead and made my reaction probably stronger.
- The vehicle and the strobe. Both at the same time.
- When the vehicle ahead of me veered to miss the stopped vehicle
- The blinking light.

No Strobe Responses

- I saw it
- When the lead van swerved left to reveal the stopped vehicle
- When the lead car swerved, there it was in front of me.
- Nothing, only when I saw it.
- Nothing, just running up on it.
- The sight of it
- Seeing it appear as the van pulled to the left
- I saw it
- It was there with no brake light on.
- The stopped vehicle was suddenly in front of me. I guess the van swerving in front of me made me a little more alert.
- Nothing
- Seeing it.
- Its mere presence in the road
- Peripheral sight
- When van moved to other lane and car was stopped in front of me.
- When the van pulled to the right - exposing the vehicle.
- Saw the back of the vehicle

APPENDIX R. FREE RESPONSES

Question: What Factors Do You Feel Contributed To Your Level of Distraction

- Look at my speedometer and the distance display.
- I was looking ahead at the display earlier but recall looking at the back of the van when it swerved and then seeing the vehicle ahead stopped.
- Watching my distance boredom with the repetition of driving.
- Trying to maintain speed as instructed and watching the display on the dashboard.
- Trying to stay the proper distance from the van, watching the gauge.
- I was paying total attention to the van and trying not to run into it.
- Concentrating on keeping the car I was driving within the 4 feet range behind the van - the location of the read out gauge puts you at a visual distance from the speedometer, the car in front and the rear view mirrors.
- I had decided a few minutes earlier that my estimate of the distance between me and the lead vehicle was more accurate than relying constantly on the switching numerical data. I am a good estimator. I was getting VERY distracted before that and made a decision based on my speed to feel more in control.
- Not being able to see around the van in front of me.
- Watching for the 24feet distance reading. 2. The moving of the van to the left side of the road. However, I had begun to accept that behavior and paid little attention to it.
- Was getting comfortable with the routine.
- Van moving to the left lane.
- Trying to maintain the correct following distance.
- The conversation I was having at the time. The monotony of the experiment.
- Trying to get the proper distance from the vehicle in front of me.
- Monotony of driving. Concentrating on maintaining following distance.
- Checking the distance display - except I had sort of given up checking so often and was concentrating more on staying a constant distance from the lead vehicle.
- I was comfortable with the test drive and I was concentrating on maintaining the 24 feet separation.
- Trying to keep the prescribed distance between myself and the lead vehicle.
- She asked me what my distance was and when the van moved the meter went up to 300.
- Slight distraction due to my inability to keep the proper distance (which felt like sluggish acceleration of the test car)
- Attention to distance, sudden swerve of lead vehicle.
- That I might hit the car
- I felt bored and a little tired of concentrating
- Watching the number of feet sensor
- I was concentrating on the van in front
- The closeness of vehicles, the distance meter reading and the asking of questions coupled with the van swerving, all were complete distractions from the stopped vehicle, which slowed my reaction time "slightly".
- I was focused on the feet-meter deal and not really paying attention to the road.
- Watching van move to other lane and also checking my distance.

- Looking at the headway display, trying to keep the correct distance between my car and the van.
- Distance display, especially the fact that the distance displayed was 300, which was not true, so I kept looking for the next readout.

APPENDIX S. FREE RESPONSES FROM SUBJECTS IN THE NO STROBE CONDITION

Question. Do You Think That Some Kind Of Warning Alerting You To The Presence Of The Stopped Vehicle Would Have Changed Your Reaction?

- Yes - I would have slowed/braked sooner - but what kind of warning?
- Yes, I would probably had my foot on the brake rather than the accelerator and would have braked and swerved.
- Would have slowed and braked sooner
- If a warning signal were given I would likely have braked sooner or stopped sooner or changed lanes if I could have. This was real because there are no alerting factors in real traffic situations.
- Sure, I would have been watching more carefully and been prepared for an immediate stop.
- Had the van activated a turn signal of some sort, I'd have been alerted to expect something.
- Oh yes forearmed is forewarned
- No - still would have went to swerve then brake.
- If the stopped car had a brake light.
- Yes anything - lights flashing or cones or flares or anything. I would have been warned and probably slowed down.
- Yes, if the light appeared before I was able to see the vehicle.
- I do think it would. I would have had more time to stop or turn off the road.
- Yes a light or some kind of audio alert would have been nice.
- Only if it had been viewable from a distance - like traffic triangles or something on the car itself. I don't think it would have made a difference.
- Yes - when see anytime of warning light - Makes me more aware that something has happened or is coming and need to slow down.
- I probably would have braked before seeing the stopped vehicle
- Might have depending on the type of alert and position (i.e. you see it as soon as the van starts to change the lane or you don't see it until the lane change is almost complete)

APPENDIX T. FREE RESPONSES

Question. When you Experience Strobe Signs in Transportation, in General What Message Do You Think Is Conveyed By This Type Of Signal

- Yes, traffic lights especially the red light. Used in Illinois at foggy intersections.
- Yes. At a traffic light on a highway or certain emergency vehicles.
- Strobe lights on traffic lights in high speed areas; strobe lights on warning signs that an upcoming signal was going to turn red and traffic needed to slow down.
- On School buses
- Yes, red stop lights
- In traffic lights
- Traffic lights, in some police vehicles. First was in traffic lights.
- Just on a couple of local traffic lights.
- Yes, traffic lights, VDOT vehicles and fire vehicles.
- Traffic lights.
- Have seen them in School buses and some emergency vehicle. They are very visible.
- NO
- Emergency vehicles
- Police cars, construction vehicles etc.
- No
- I have seen them on traffic lights and school buses.
- Yes - 460 bypass and other similar ones.
- Yes, on traffic lights on 460 bypass at Southgate road.
- Yes, on top of police cars, ambulances etc.
- Yes, on top of school buses and at traffic lights.
- No
- Yes, on rescue vehicles
- School buses, police cars and airport runways
- My kids used them with music - very unpleasant. Ambulances and emergency vehicles.
- On emergency vehicles and in work zones
- Yes! Traffic lights - blinking signs - police cars - oversized loads, ambulance etc.
- Traffic signs
- I have seen them on bikes
- Traffic lights and buses
- Not that I can recall
- no
- no
- I've seen them in traffic lights when the light turns red.

APPENDIX U. FREE RESPONSES

Question. When You Experience Strobe Signs In Transportation, In General What Message Do You Think Is Conveyed By This Type of Signal

- Caution or stop
- Attention/danger potential
- It captures the attention rapidly and suddenly., and very obviously - they are usually used in areas that need rapid attention to signals/signs.
- To be aware of a possible hazardous condition.
- Pay attention - move. Clearly identifies what is happening.
- I suspect they are there to draw extra attention. Personally, I have found traffic light strobes to be not particularly noticeable.
- ALERT
- They catch my attention. I always notice them. I've always thought they were a good idea from an attention-getting safety perspective. But, I have thought that their power lies in their novelty.
- Warning
- New traffic signal installed.
- Warning
- Stopped vehicle up ahead
- Something is wrong or an emergency vehicle is ahead.
- Be alert most likely, there are people on the road in harms way I.e. your car.
- Trying to control the traffic flow.
- Be alert
- They attract attention
- Be alert for stopped vehicles
- Danger - caution
- To be aware of a school bus of children are close by and to see clearly a traffic signal is coming up.
- Warning, caution, imminent change of driving conditions (traffic conditions)
- Something out of the ordinary is up
- Pay attention
- Be ready to stop or drive carefully
- Caution - warning - danger - be alert
- Warning of some sort
- Danger, drive with care
- Warning
- There has been an accident
- The sign redirects my attention to the area where it is placed. It causes me to look more closely at the sign it complements.

APPENDIX V. FREE RESPONSES BY SUBJECTS IN THE STROBE CONDITION ONLY

Question. The Purpose of This Strobe Is To Alert Drivers To The Presence Of A Vehicle At A Dangerously Unsafe Distance Up Ahead. Is This How You Perceived The Signal

- Yes
- Yes
- Yes
- Yes
- No
- Yes
- Yes
- I really can't say one way or the other. When the lead car started to pull out and I saw something in my lane, I automatically followed the lead vehicle. I can't even say that I saw a strobe light.
- I perceived it as a stopped vehicle at a barrier in the road.
- Yes
- Yes
- The strobe made me realize that I needed to react strongly, and stop, not just slow down.
- Yes
- Yes
- Yes

APPENDIX W. FREE RESPONSES

Question. What One Word Would Best Describe Your Reaction When You First Saw The Strobe

Strobe

- Surprised
- Surprise
- Yikes
- Surprise
- Whoa!
- Surprise
- Stop!
- I reacted automatically. I reacted more to the visual presence of something in my lane more than a light.
- Panic
- Brake car
- Panic
- Stop
- Emergency
- Surprised
- Avoidance
- Stop!

No strobe

- Surprise - but not so close that I felt in danger
- Surprised
- Eeekk
- Fright
- Shock
- Surprise
- Surprise!
- Surprise
- Its stopped
- Shock
- Startled
- Brake
- Shock
- Surprise
- panicked
- shock
- stop

APPENDIX X: VITA

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EDUCATION:

M.S. (candidate). Human Factors Engineering, August 1998-present.
Virginia Tech Blacksburg, VA

Post Graduate Studies in Psychology (Human Factors concentration), August 1997-May 1998.
Miami University Oxford, OH

B.Sc. with Honors and DPS (Diploma in Professional Studies) in Ergonomics July 1992 to June 1996.
Loughborough University Loughborough, England

Second Class Honors, Upper Division

COURSE HIGHLIGHTS:

- Ergonomics and Design I and II
- Experimental Psychology I and II
- Information Technology Skills
- Occupational Tasks and Skills
- Physiology of Physical Activity
- Human Factors in Manufacturing Systems
- Human Response to Vision and Lighting
- Biomechanics
- Organizational Behavior
- Research Design
- Human Response to Thermal Environment
- Issues in Psychology
- Ergonomics in Product Design I and II
- Systems Design
- Human Response to Noise and Vibration
- Organizational Issues in IT Systems
- Usability Engineering
- Seminar in Perception and Cognition
- Macroergonomics
- Human Audition and Auditory Displays

WORK EXPERIENCE:

Graduate Research Assistant May 1998 – present
Virginia Tech, Center for Transportation Research Blacksburg, VA

This work involves research conducted in predominantly naturalistic environments leading to authorship of technical reports over a variety of projects. Current research involves the design and implementation of an evaluation plan to perform a usability evaluation on a web and telephone interface. These interfaces are aimed at helping the general public access travel information. A study evaluating an innovative rear lighting system for a major sponsor is also in progress which will provide a sound basis for my master's thesis. Recent projects included research for SAE to develop a set of criteria for prioritizing in-vehicle messages and the development of data collection mechanisms to facilitate gathering of qualitative sleep data during on-road testing of tractor-trailer sleeper berths. Early projects involved compilation of driver error taxonomies and naturalistic observations of driver behavior.

Graduate Teaching Assistant August 1997 to May 1998
Miami University Oxford, OH

Assisted in the instruction of undergraduate students in basic Human Factors and Statistics courses. Graded class exams, held office hours, and addressed student questions and concerns. Also conducted research on usability assessment of computer input devices.

Human Factors Research Associate — September 1996 to August 1997
LUTCHI Research Institute — Loughborough, England

Put together a usability evaluation and performed research for LUTCHI (Loughborough University Telecommunications and Human Computer Interaction) Research Institute in collaboration with British Aerospace on a European project to evaluate a prototype data exchange mechanism (interface and process). This mechanism will improve the manufacturing design process by transferring data between CASE (Computer Aided Systems Engineering) design tools. My responsibilities were to, design and conduct in-depth on site interviews in the UK and abroad, aid in the design of field evaluations and research and implement relevant standards.

Research Assistant — July 1994 - October 1995
HUSAT Research Institute — Loughborough, England

Research at HUSAT (Human Sciences and Advanced Technology) Research Institute was conducted across 5 EEC funded projects. The main research area was design, evaluation and implementation of future rehabilitation and assistive products for elderly and disabled people. The job required writing reports, conducting literature searches, focus groups, workshops, designing and conducting in-depth on site and telephone interviews and taking part in lab trials of telecommunication equipment. This research also lead to acknowledgement as a contributor to the 'USERFIT' handbook.

PUBLICATIONS AND TECHNICAL REPORTS:

Robinson, G.S., Neale, V.L., Petersen, A., Belz, S.M., Cooper, L.M., Casali, J.G., and Dingus, T.A. (1999). On-Road Measurement of Long-Haul Driver Fatigue and Performance using a Critical Incident-Based Computer-Controlled Data Acquisition System. Second International Truck and Bus Safety Symposium, Knoxville, TN October 6-8.

Cooper, L. M., Gellatly, A. W., and Dingus, T. A. (1998). ITS In-Vehicle Message Priority. Literature Review and Annotated Bibliography. (SAE J2395). Blacksburg, VA: Center for Transportation Research, Virginia Tech.

Cooper, L. M. and Parker, C. (1997). Ergonomic Issues in Tractor Accidents: The Hitching System. Contemporary Ergonomics, 238-243.

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