

San Jose State University

SJSU ScholarWorks

Mineta Transportation Institute Publications

6-2020

Effective Communication Message Strategy for Enhancing Traffic Safety in Fresno County: The Role of Time Horizon, Regulatory Focus, and Perceived Personal Control

Samer Sarofim
California State University, Fresno

Follow this and additional works at: https://scholarworks.sjsu.edu/mti_publications



Part of the [Civil Engineering Commons](#), and the [Transportation Engineering Commons](#)

Recommended Citation

Samer Sarofim. "Effective Communication Message Strategy for Enhancing Traffic Safety in Fresno County: The Role of Time Horizon, Regulatory Focus, and Perceived Personal Control" *Mineta Transportation Institute Publications* (2020). <https://doi.org/10.31979/mti.2020.1908>

This Report is brought to you for free and open access by SJSU ScholarWorks. It has been accepted for inclusion in Mineta Transportation Institute Publications by an authorized administrator of SJSU ScholarWorks. For more information, please contact scholarworks@sjsu.edu.

Effective Communication Message Strategy for Enhancing Traffic Safety in Fresno County: The Role of Time Horizon, Regulatory Focus, and Perceived Personal Control

Samer Sarofim, PhD



MINETA TRANSPORTATION INSTITUTE

Founded in 1991, the Mineta Transportation Institute (MTI), an organized research and training unit in partnership with the Lucas College and Graduate School of Business at San José State University (SJSU), increases mobility for all by improving the safety, efficiency, accessibility, and convenience of our nation's transportation system. Through research, education, workforce development, and technology transfer, we help create a connected world. MTI leads the four-university, MTI leads the four-university California State University Transportation Consortium funded by the State of California through Senate Bill 1.

MTI's transportation policy work is centered on three primary responsibilities:

Research

MTI works to provide policy-oriented research for all levels of government and the private sector to foster the development of optimum surface transportation systems. Research areas include: bicycle and pedestrian issues; financing public and private sector transportation improvements; intermodal connectivity and integration; safety and security of transportation systems; sustainability of transportation systems; transportation / land use / environment; and transportation planning and policy development. Certified Research Associates conduct the research. Certification requires an advanced degree, generally a Ph.D., a record of academic publications, and professional references. Research projects culminate in a peer-reviewed publication, available on TransWeb, the MTI website (<http://transweb.sjsu.edu>).

Education

The Institute supports education programs for students seeking a career in the development and operation of surface transportation systems. MTI, through San José State University, offers an AACSB-accredited Master of Science in Transportation Management and graduate certificates in Transportation Management, Transportation Security, and High-Speed Rail Management that serve to prepare the nation's transportation managers for the 21st century. With the

active assistance of the California Department of Transportation (Caltrans), MTI delivers its classes over a state-of-the-art videoconference network throughout the state of California and via webcasting beyond, allowing working transportation professionals to pursue an advanced degree regardless of their location. To meet the needs of employers seeking a diverse workforce, MTI's education program promotes enrollment to under-represented groups.

Information and Technology Transfer

MTI utilizes a diverse array of dissemination methods and media to ensure research results reach those responsible for managing change. These methods include publication, seminars, workshops, websites, social media, webinars, and other technology transfer mechanisms. Additionally, MTI promotes the availability of completed research to professional organizations and journals and works to integrate the research findings into the graduate education program. MTI's extensive collection of transportation-related publications is integrated into San José State University's world-class Martin Luther King, Jr. Library.

Disclaimer

The contents of this report reflect the views of the authors, who are responsible for the facts and accuracy of the information presented herein. This document is disseminated in the interest of information exchange. The report is funded, partially or entirely, by a grant from the State of California. This report does not necessarily reflect the official views or policies of the State of California or the Mineta Transportation Institute, who assume no liability for the contents or use thereof. This report does not constitute a standard specification, design standard, or regulation.

REPORT 20-17

**EFFECTIVE COMMUNICATION MESSAGE STRATEGY FOR
ENHANCING TRAFFIC SAFETY IN FRESNO COUNTY: THE
ROLE OF TIME HORIZON, REGULATORY FOCUS, AND
PERCEIVED PERSONAL CONTROL**

Samer Sarofim, PhD

June 2020

A publication of

Mineta Transportation Institute

Created by Congress in 1991

College of Business
San José State University
San José, CA 95192-0219

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. 20-17	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Effective Communication Message Strategy for Enhancing Traffic Safety in Fresno County: The Role of Time Horizon, Regulatory Focus, and Perceived Personal Control		5. Report Date June 2020	
		6. Performing Organization Code	
7. Authors Samer Sarofim, PhD		8. Performing Organization Report CA-MTI-1908	
9. Performing Organization Name and Address Mineta Transportation Institute College of Business San José State University San José, CA 95192-0219		10. Work Unit No.	
		11. Contract or Grant No. ZSB12017-SJAUX	
12. Sponsoring Agency Name and Address State of California SB1 2017/2018 Trustees of the California State University Sponsored Programs Administration 401 Golden Shore, 5th Floor Long Beach, CA 90802		13. Type of Report and Period Covered Final Report	
		14. Sponsoring Agency Code	
15. Supplemental Notes DOI: 10.31979/mti.2020.1908			
16. Abstract <p>This research empirically investigated the differential effect of message framing on message recipients' attitudes and intended behaviors related to pedestrian, cyclist, and motorist traffic safety practices. The framework empirically investigated time horizon (expansive vs. limited) and regulatory focus (prevention vs. promotion) message framing.</p> <p>The time horizon in the message can make someone either think of the future (expansive) or the present (limited). For example, an expansive time horizon message communicates that life is long and directs the focus on the future. On the contrary, a limited time horizon message communicates that life is short and directs the focus on the present moment. The regulatory focus of the message can direct the message recipients' attention to take certain action to either avoid negative consequences (prevention) or attain positive outcomes (promotion).</p> <p>The research examined the role of the individual difference of perceived personal control on the perceptions of the presented messages and behavioral intentions to adopt safe transportation practices. Various messages were designed to employ a multilayer framing and fit with a 2 (time horizon: expansive vs. limited) x 2 (regulatory focus: promotion vs. prevention) between-subjects design. Findings suggest the messages adopting the expansive and promotion-focused framing combination seem to be more effective and have a higher tendency to induce positive intentions to act safe on the road for both pedestrians and motorists. Also, perceived personal control serves as a positive significant predictor of various safety-related motivations and intended behaviors. This research experimentally studied the differential effects of time horizon and regulatory focus framing on advancing traffic safety throughout effective messaging, an endeavor that shall benefit transportation authorities, city administrators, policymakers, and the general public. The tested message framing can be adopted in various forms, including text message, billboards, road signs, flyers, educational workshops, etc.</p>			
17. Key Words Communication, safety, risk, perceptions, personality	18. Distribution Statement No restrictions. This document is available to the public through The National Technical Information Service, Springfield, VA 22161		
19. Security Classif. (of this report) Unclassified	20. Security Classif. (of this page) Unclassified	21. No. of Pages 17	22. Price

Copyright © 2020
by **Mineta Transportation Institute**
All rights reserved

DOI:
10.31979/mti.2020.1908

Mineta Transportation Institute
College of Business
San José State University
San José, CA 95192-0219

Tel: (408) 924-7560
Fax: (408) 924-7565
Email: mineta-institute@sjsu.edu

transweb.sjsu.edu

ACKNOWLEDGMENTS

The author thanks the Fresno State Transportation Institute (FSTI) for offering the resources and the support needed to conduct this research project. The author especially thanks Dr. Aly Tawfik, Executive Director of the Fresno State Transportation Institute, for his tremendous support and advice throughout the course of this project.

The author thank Editing Press, for editorial services, as well as MTI staff, including Executive Director Karen Philbrick, PhD; Deputy Executive Director Hilary Nixon, PhD; Graphic Designer Alverina Eka Weinardy; and Executive Administrative Assistant Jill Carter.

TABLE OF CONTENTS

Executive Summary	1
I. Methodology	2
Design	2
Procedure	2
Sample	2
II. Findings	4
III. Conclusions and Recommendations	10
Appendix A: Messages	11
Appendix B: Personal Control Scale, adopted from Lachman and Weaver (1998)	12
Endnotes	13
Bibliography	14
About the Author	16
Peer Review	17

LIST OF FIGURES

1. The Differential Effect of Regulatory Focus of the Message on Perception of Message's Ability to Reduce Pedestrians and Cyclists Accidents	7
2. The Differential Effect of Regulatory Focus of the Message on Perception of Message's Ability to Deter Others from Speeding	7
3. The Differential Effect of Regulatory Focus of the Message on the Likelihood of the Message to Make Participants Exercise More Caution While Crossing	8
4. The Differential Effect of Time Horizon of the Message on Participants' Agreement that the Message Would Make Participants Monitor Drinking While Driving	8
5. The Interaction Effect of Regulatory Focus and Time Horizon on Message Credibility	9
6. The Interaction Effect of Regulatory Focus and Time Horizon on Message Effectiveness	9

LIST OF TABLES

1. Sample Characteristics	3
2. ANOVA – The Effect of Prevention vs. Promotion Regulator Focus Message Framing	5
3. Correlations Between Perceived Personal Control and Dependent Variables	7

EXECUTIVE SUMMARY

The motivation for this research stemmed from multiple recent meetings with a variety of transportation stakeholders including Fresno Council of Government, California Department of Transportation (Caltrans) District 6, and City of Fresno Public Works Department. Discussions about the role of effective messaging in changing public attitudes and behaviors to increase traffic safety indicated the lack of a cohesive messaging strategy. Current messages, and their framing, seem to be conducted on an ad-hoc basis and forego the benefit of building on the vast academic research on message strategy and framing. This research is aimed at identifying effective messaging strategies and framing that shall induce attitudinal and behavioral changes rated to traffic safety.

Fresno, due to its high rate of pedestrian and bicyclist fatalities, is selected as a focus city. The Federal Highway Administration has included Fresno in the list of cities with the highest bicycle and pedestrian fatalities since 2015. The Focus Cities Program in California, a joint program between UC Berkeley Safe TREC and California Walks, aims at supporting community efforts geared towards the development of safe walking and biking communities and programs.

Message framing has increasingly attracted both scholars' and practitioners' attention, as it influences various behaviors.¹ For instance, message framing has been found to affect consumers' decision making when buying, using, or recommending health care products, and it has been found that positive and negative framing messages are more effective for prevention and detection products, respectively.² Similarly, Wu et al. illustrated the differential effect of message framing on the effectiveness of dietary supplement advertisements.³

This research investigates the effectiveness of different messaging strategies and frames that are aimed at inducing safer behaviors among pedestrians, cyclists, and motorists. The framework empirically investigates time horizon (expansive vs. limited) and regulatory focus (prevention vs. promotion) framing. The author experimentally studies the differential effects of time horizon and regulatory focus message framing on advancing traffic safety, an endeavor that shall benefit the public, transportation authorities, city administrators, and policy makers.

Findings suggests that the utilization of expansive horizon time framing and promotion-focused messaging could lead to higher perceptions of message credibility and greater intentions to act safely on the roads. Also, the individual difference of perceived personal control was significantly correlated with various safety behavioral intentions, suggesting that future research would benefit from message framing that heightens the sense of personal control.

Decision makers will be able to use the results of this research to effectively allocate communication efforts and spending to induce attitudinal and behavioral change that shall enhance the safety of active transportation modes.

I. METHODOLOGY

DESIGN

The messages were designed to fit with a 2 (time horizon: expansive vs. limited) × 2 (regulatory focus: promotion vs. prevention) between-subjects design. The time horizon manipulation was adapted from Williams and Drolet.⁴ For the complete messages, see Appendix A. Participants were randomly assigned to see one of the four messages. The content of the four messages was slightly modified to suit the participants' indicated main mode of transportation (motorists vs. cyclists and pedestrians) that was included in the initial screening questions.

PROCEDURE

Participants were randomly assigned to see one of the four messages. After reading the message, participants completed a set of related appeal, attitudinal, and behavioral intentions questions and scales. Questions included participants' perceptions about message credibility (1–7; anchored on 1 = “Not at All” and 7 = “Very Much”) and perception of the message's ability to deter others from speeding (1–5; anchored on 1 = “Strongly Disagree” and 5 = “Strongly Agree”); scales were adapted from Tay and De Barros.⁵

The likelihood of the message causing participants to exercise more caution while crossing (1–7; anchored on 1 = “Extremely Unlikely” and 7 = “Extremely likely”) was adapted from Glendon and Walker, and the scale of agreement for whether the message would make participants monitor drinking while driving (1–5; anchored on 1 = “Strongly Disagree” and 5 = “Strongly Agree”), adapted from Lewis, Watson, & Tay, was also included.⁶

A scale was adapted from Lewis, Watson, and White to assess the usefulness of message information for how people can reduce their risk of pedestrian and cycling accidents; message effectiveness in providing a strategy (or strategies) in reducing pedestrians' and cyclists' accidents; and effectiveness of adopting the message's recommendations in reducing accidents involving pedestrians and cyclists using a 1–7 scale (anchored on 1 = “Strongly Disagree” and 7 = “Strongly disagree”).⁷

The belief that the message would be effective in reducing pedestrians' and cyclists' accidents in general was measured using a 1–5 scale (anchored on 1 = “Not at All Effective” and 5 = “Very Effective”), adapted from Glendon and Cernecca.⁸ Participants also completed individual differences scales, and among those scales was a four-item perceived personal control individual difference scale ($\alpha = .86$), adapted from Lachman and Weaver: see Appendix B.⁹ Demographics were finally collected.

SAMPLE

Quota sampling was used to ensure equal gender distribution (50% males, 50% females) and maximize efforts to include participants from the 15 cities in Fresno County. Also, sampling attempted to map onto the population proportions of the 15 cities. The sample is composed of 400 respondents from Central California, recruited via a marketing research firm to complete

the study. Detailed Sample characteristics are shown in Table 1.

Table 1. Sample Characteristics

Characteristic	Percentage	Characteristic	Percentage	Characteristic	Percentage
City Population		Ethnicity		Education	
Clovis	16.5	American Indian or Alaska Native	2.8	Less than high school	6.5
Coalinga	1.8	Hispanic/Latino	35.0	High school graduate (or GED)	25.5
Firebaugh	0.3	Black or African American	7.2	Vocational or technical training	5.8
Fowler	1.3	Native Hawaiian or Pacific Islander	1.0	Some college (no degree)	27.8
Fresno	59.5	White Caucasian	40.3	Two-year college degree	10.3
Huron	0.8	Asian	6.8	Bachelor's degree	14.5
Kerman	2.0	Multiracial	3.3	Master's degree	7.0
Kingsburg	2.5	Other	1.3	Doctoral degree (PhD, JD, MD, etc.)	2.8
Mendota	1.0	Prefer not to answer	2.5		
Orange Cove	1.0				
Parlier	1.8				
Reedley	3.8				
San Joaquin	0.8				
Sanger	3.8				
Selma	3.5				
Age		Total Annual Household Income		Employment Status	
18 to 24	23.5	Less than \$30,000	43.0	Working full-time	34.3
25 to 34	29.5	\$30,000 to \$49,999	19.8	Working part-time	16.3
35 to 44	20.8	\$50,000 to \$74,999	15.3	Self-employed	6.8
45 to 54	11.0	\$75,000 to \$99,999	7.5	Homemaker or stay-at-home parent	8.8
55 to 64	8.0	\$100,000 to \$124,999	5.5	Student	11.3
65 or older	7.2	\$125,000 to \$149,999	4.3	Out of work, but looking for work	10.5
		\$150,000 to \$199,999	1.5	Out of work, but not looking for work	1.0
		\$200,000 to \$249,999	0.8	Unable to work (e.g., disability)	6.5
		\$250,000 or more	2.5	Military	0.3
				Retired	9.5
Gender		Main Mode of Transportation			
Male	50	Motorists	80		
Female	50	Pedestrians and Cyclists	18		
		Other	2		

II. FINDINGS

The regulatory focus of the message showed a differential significant main effect on perceptions of a message's ability to reduce pedestrians' and cyclists' accidents in general, perception of a message's ability to deter others from speeding, and the likelihood of the message causing participants to exercise more caution while crossing.

One-way ANOVA testing (see Table 2 for all ANOVA results) showed that when compared to prevention-focus message framing, promotion-focus message framing demonstrated more positive perceptions of the message's ability to reduce pedestrians' and cyclists' accidents in general (see Figure 1).

Similarly, compared to those participants under the prevention-focus condition, motorist participants under the promotion-focus condition indicated higher perceptions of a message's ability to deter others from speeding (see Figure 2).

Also, pedestrian participants under the promotion-focus condition expressed more likelihood that the message would make participants exercise more caution while crossing compared to those under the prevention-focus condition (see Figure 3).

The time horizon manipulation of the message showed a significant main effect on motorist participants' agreement that the message would lead participants to monitor drinking while driving, where the expansive time horizon manipulation showed more positive results than the limited time horizon manipulation (see Figure 4).

A two-way ANOVA revealed significant interaction between time horizon manipulation and regulator focus manipulation on participants' perception of message credibility (see Figure 5). The message framing that combines the promotion-focus and expansive time horizon showed the highest perceptions of message credibility.

The three items assessing message effectiveness adapted from Lewis, Watson, & White showed high inter-scale reliability ($\alpha = .84$), and hence they averaged into a single measure that indicates the overall message effectiveness.¹⁰ A two-way ANOVA revealed a significant interaction between time horizon manipulation and regulator focus manipulation on participants' perception of message effectiveness (see Figure 6). The message framing that combines the promotion-focus and expansive time horizon showed the highest perceptions of message effectiveness.

Perceived personal control showed significant positive correlations with people's perceptions about the overall message effectiveness and the message's ability to reduce pedestrian and cycling accidents in general, deter other drivers from speeding, make people exercise more caution while crossing, and encourage people to monitor drinking while driving (see Table 3).

Table 2. ANOVA – The Effect of Prevention vs. Promotion Regulator Focus Message Framing

		Mean	Std. Deviation		Sum of Squares	df	Mean Square	F	Sig.
Message's ability to reduce pedestrians' and cyclists' accidents in general	Prevention Focus	3.35	1.15	Between Groups	6.546	1	6.546	4.981	.026
Promotion Focus		3.61	1.14	Within Groups	523.032		1.314		
Total		3.47	1.15	Total	529.578				
Message's ability to deter others from speeding	Prevention Focus	3.23	.99	Between Groups	5.367	1	5.367	5.348	.021
Promotion Focus		3.49	1.00	Within Groups	319.130		1.004		
Total		3.35	1.01	Total	324.497				
Message would make participants exercise more caution while crossing	Prevention Focus	4.72	1.99	Between Groups	18.128	1	18.128	5.730	.019
Promotion Focus		5.68	1.49	Within Groups	246.759		3.164		
Total		5.16	1.83	Total	264.887				

ANOVA – The Effect of Expansive vs. Limited Time Horizon Framing

		Mean	Std. Deviation		Sum of Squares	df	Mean Square	F	Sig.
Motorist participants' agreement that the message would lead participants to monitor drinking while driving	Limited Time Horizon	6.07	1.61	Between Groups	10.510	1	10.510	5.598	.019
Expansive Time Horizon		6.43	1.07	Within Groups	596.987		1.877		
Total		6.25	1.38	Total	607.497				

Two-way ANOVA: The Interaction Between Time Horizon Manipulation and Regulator Focus

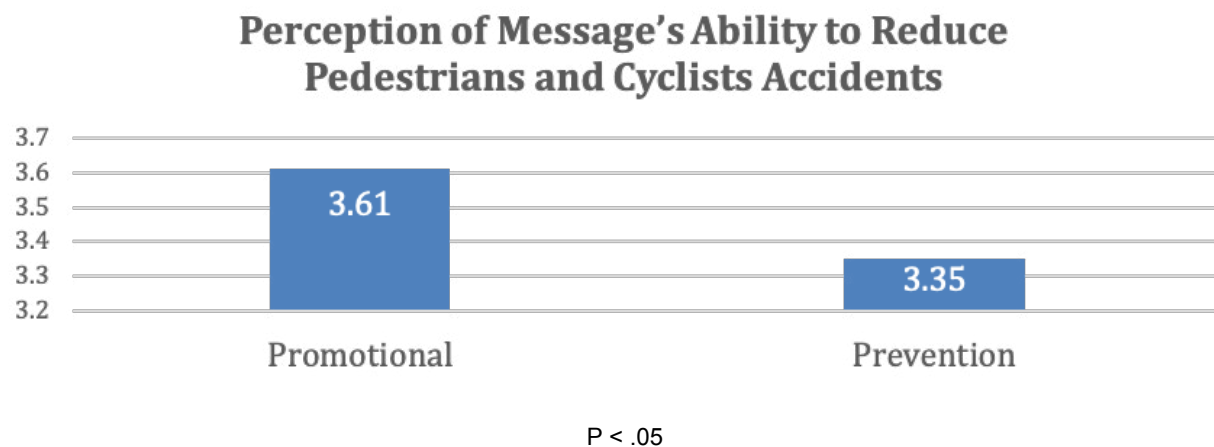
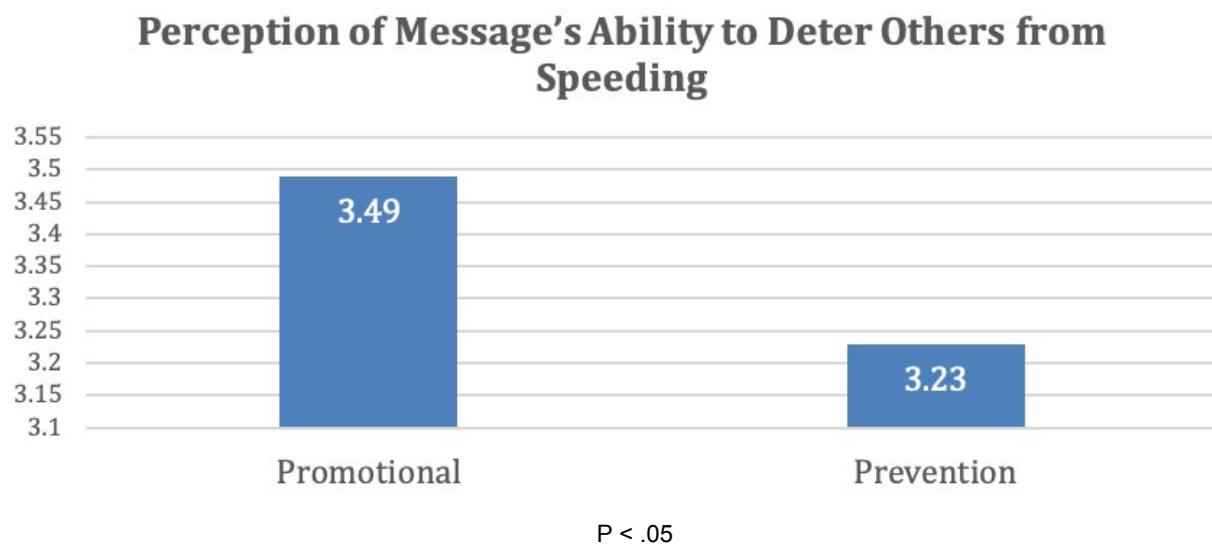
	Mean	Std. Deviation	Type III Sum of Squares	df	Mean Square	F	Sig.
--	------	----------------	-------------------------	----	-------------	---	------

			Mean	Std. Deviation		Sum of Squares	df	Mean Square	F	Sig.
Message Credibility	Promotion Focus message	Limited Time Horizon	5.68	1.50	Regulatory Focus	.262	1	.262	.132	.717
	Promotion Focus message	Expansive Time Horizon	6.10	1.28	Time Horizon	.940	1	.940	.474	.492
	Prevention Focus message	Limited Time Horizon	6.05	1.30	Interaction	9.932	1	9.932	5.007	.026
	Prevention Focus message	Expansive Time Horizon	5.83	1.51	Error	785.514	396			
					Total	14744	400			
Message Effectiveness	Promotion Focus message	Limited Time Horizon	5.22	1.32	Regulatory Focus	5.111	1	5.111	3.171	.076
	Promotion Focus message	Expansive Time Horizon	5.46	1.12	Time Horizon	.221	1	.221	.137	.712
	Prevention Focus message	Limited Time Horizon	5.28	1.28	Interaction	7.915	1	7.915	4.91	.027
	Prevention Focus message	Expansive Time Horizon	4.95	1.32	Error	638.298	396	1.612		
					Total	11516.222	400			

Table 3. Correlations Between Perceived Personal Control and Dependent Variables

		Reduce pedestrians and cyclists' accidents in general	Deter other drivers from speeding	Exercise more caution while crossing	Monitor drinking while driving	Message Credibility	Message Effectiveness
Perceived Personal Control	Pearson Correlation	.311**	.342**	.586**	.252**	.357**	.458**
	Sig. (two-tailed)	.000	.000	.000	.000	.000	.000

** . Correlation is significant at the 0.01 level (two-tailed).

**Figure 1. The Differential Effect of Regulatory Focus of the Message on Perception of Message's Ability to Reduce Pedestrians and Cyclists Accidents****Figure 2. The Differential Effect of Regulatory Focus of the Message on Perception of Message's Ability to Deter Others from Speeding**

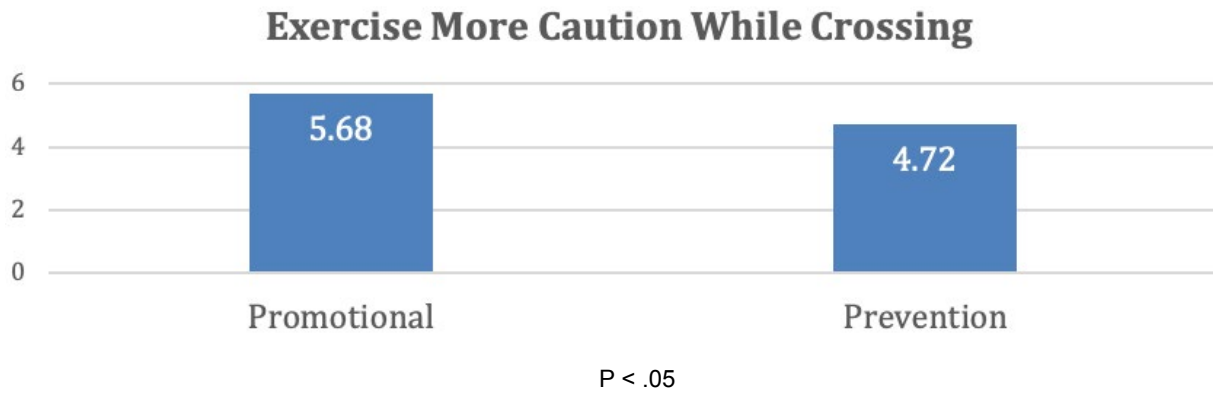


Figure 3. The Differential Effect of Regulatory Focus of the Message on the Likelihood of the Message to Make Participants Exercise More Caution While Crossing

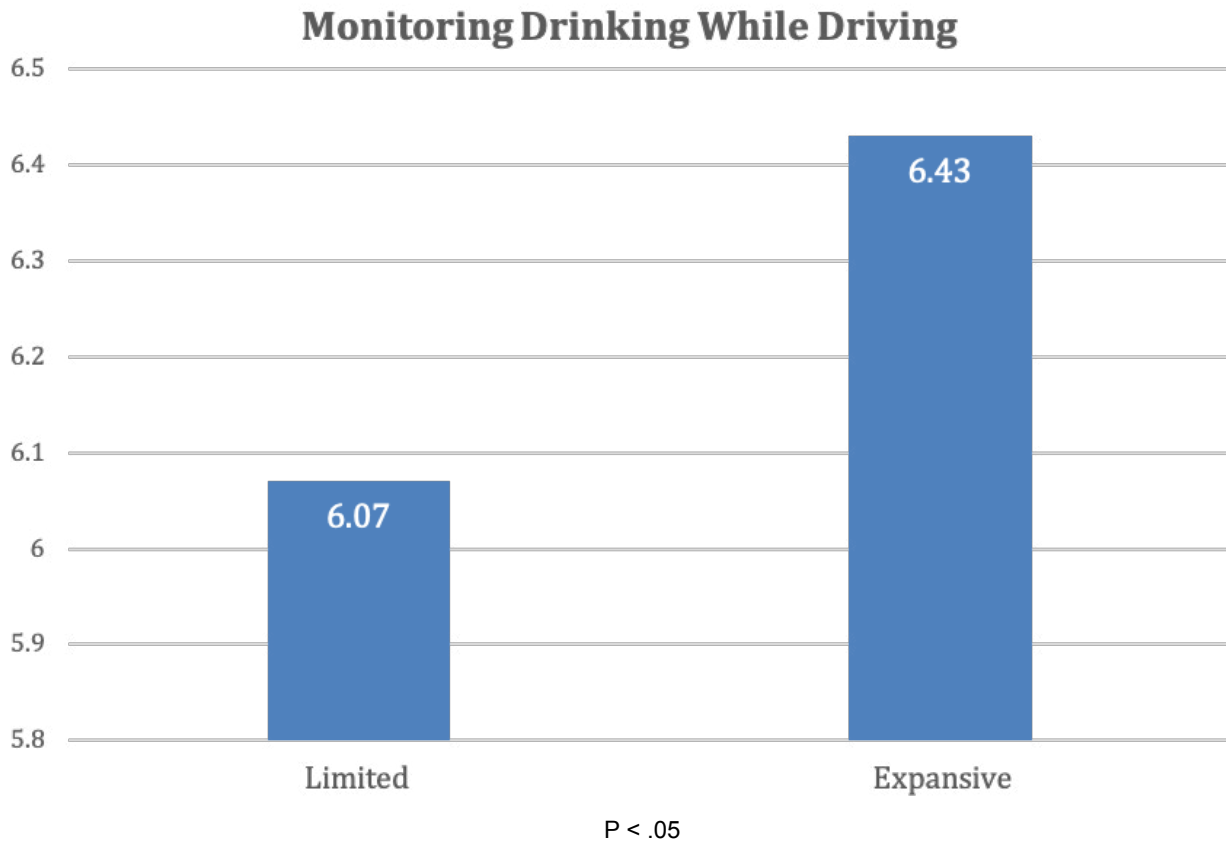


Figure 4. The Differential Effect of Time Horizon of the Message on Participants' Agreement that the Message Would Make Participants Monitor Drinking While Driving

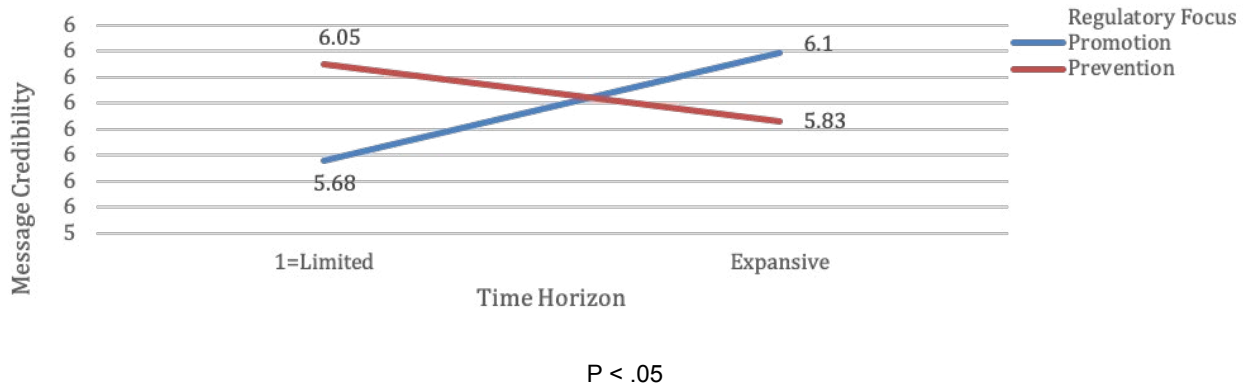


Figure 5. The Interaction Effect of Regulatory Focus and Time Horizon on Message Credibility

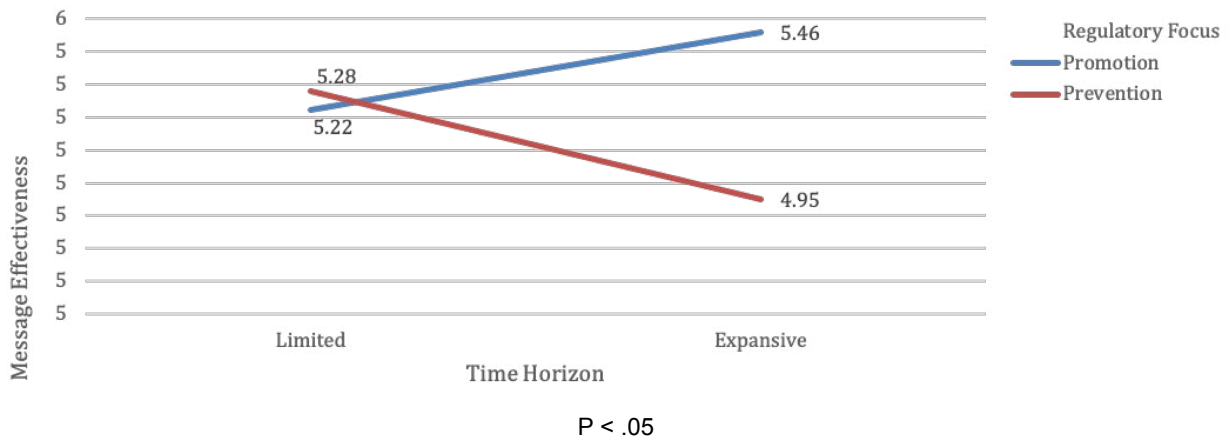


Figure 6. The Interaction Effect of Regulatory Focus and Time Horizon on Message Effectiveness

III. CONCLUSIONS AND RECOMMENDATIONS

Findings suggest that message framing could lead to differential effects when promoting transportation safety. The perceived message credibility and effectiveness (e.g., providing useful information, communicating effective strategies, and the applicability of adopting the message strategies) were perceived differently depending on whether the message was designed with expansive vs. limited time horizon or promotion- vs. prevention-focused framing. Also, the message framing influences essential transportation safety practices. For instance, intentions to monitor drinking when planning to drive were affected by the time horizon manipulation of the message. When expansive time horizon is used (e.g., life is long), participants showed significantly higher intention to monitor drinking when planning to drive than when the limited time horizon message is used (e.g., life is short).

Continuing to demonstrate the effect of message framing on transportation safety intended behaviors, findings suggest that promotion-focused messages tend to be more effective than prevention-focused messages. The perception of the message's ability to reduce pedestrians' and cyclists' accidents was higher for the promotion-focused messages than for the prevention-focused messages. Similarly, perceptions about the message's ability to deter other drivers from speeding was higher among participants presented with the promotion-focused message than those who were presented with the prevention-focused message. Also, the essential safety practice of exercising caution while crossing was affected by the regulatory focus (promotion vs. prevention) of the message, where the promotion-focused message continued to show more favorable effects.

This research and its findings suggest that the prevention-focused messaging could be more effective than prevention-focused messaging when promoting transportation safety. Furthermore, transportation safety messages that promote recipients' thinking of time as more expansive (versus limited) seem to have more favorable effects.

Importantly, when considering the integration of both regulatory focus and time horizon framing in the same message, the combination of expansive time horizon and promotion-focus tends to have the most favorable effects on the perceived message credibility and effectiveness, providing transportation authorities with directions in message framing to yield the desirable safety-related effects.

APPENDIX A: MESSAGES

Time Horizon Manipulation (adapted from Williams and Drolet 2005)

Expansive	Because Life is Longer than You Think, Focus on what's Yet to Come	Each message randomly presents one of the time horizon manipulations at the beginning
Limited	Because Life is Shorter than You Think, Focus on the Moment	

Body of the Message

Motorists	<p>Pedestrians and Cyclists who run into the street without first looking for oncoming vehicles do not give drivers adequate time to see them and have difficulty performing an adequate search.</p> <p>Furthermore, by running before they know it is safe, they reduce the time they have to react to an unexpected car in their path.</p> <p>Slow Down and Look for Pedestrians & Cyclists</p>	The body of the message was selected based on each participant's indicated main mode of transportation in the screening questions in the beginning of the study
Pedestrians and Cyclists	<p>Pedestrians and Cyclists who run into the street without first looking for oncoming vehicles do not give drivers adequate time to see them and have difficulty performing an adequate search.</p> <p>Furthermore, by running before they know it is safe, they reduce the time they have to react to an unexpected car in their path.</p> <p>Cross Safely</p>	

Regulatory Focus Manipulation

Promotion	Save A Life	Each message randomly presents one of the regulator focus manipulations at the end
Prevention	Do Not Waste A Life	

APPENDIX B: PERSONAL CONTROL SCALE, ADOPTED FROM LACHMAN AND WEAVER (1998)

I can do just about anything that I really set my mind to.

Whatever happens in the future mostly depends on me.

When I really want to do something, I usually find a way to succeed at it.

Whether or not I am able to get what I want is in my own hands.

All items are measured on a 7-point scale (1 = "Strongly Disagree" to 7 = "Strongly Agree")

ENDNOTES

1. Mary A. Gerend and Margaret Cullen, "Effects of Message Framing and Temporal Context on College Student Drinking Behavior," *Journal of Experimental Social Psychology* 44 (2008): 1167–1173; Alexander J. Rothman, et al., "The Strategic Use of Gain- and Loss-Framed Messages to Promote Healthy Behavior: How Theory Can Inform Practice," *Journal of Communication* 56 (2006): 202–220.
2. Chun-Tuan Chang, "Health-Care Product Advertising: The Influences of Message Framing and Perceived Product Characteristics," *Psychology & Marketing* 24, no. 2 (2007): 143–169; Chun-Tuan Chang, "Interactive Effects of Message Framing, Product Perceived Risk, and Mood—The Case of Travel Healthcare Product Advertising," *Journal of Advertising Research* 47, no. 1 (2007): 51–65.
3. Wann-Yih Wu, et al., "The Role of Endorsers, Framing, and Rewards on the Effectiveness of Dietary Supplement Advertisements," *Journal of Health Communication* 17, no. 1 (January 2012): 54–75.
4. Patti Williams and Aimee Drolet, "Age-Related Differences in Responses to Emotional Advertisements," *Journal of Consumer Research* 32, no. 3 (March 2005): 343–354.
5. Richard Tay and Alex De Barros, "Effectiveness of Road Safety Messages on Variable Message Signs," *Journal of Transportation Systems Engineering and Information Technology* 10, no. 3 (2010): 18–23.
6. A. Ian Glendon and Britta L. Walker, "Can Anti-speeding Messages Based on Protection Motivation Theory Influence Reported Speeding Intentions?" *Accident Analysis & Prevention* 57 (2013): 67–79; Ioni Lewis, Barry Watson, and Richard Tay, "Examining the Effectiveness of Physical Threats in Road Safety Advertising: The Role of the Third-Person Effect, Gender, and Age," *Transportation Research Part F: Traffic Psychology and Behaviour* 10, no. 1 (2007): 48–60.
7. Ioni M. Lewis, Barry Watson, and Katherine M. White, "Response Efficacy: The Key to Minimizing Rejection and Maximizing Acceptance of Emotion-Based Anti-Speeding Messages," *Accident Analysis & Prevention* 42, no. 2 (2010): 459–467.
8. A. Ian Glendon and Lorenzo Cernecca, "Young Drivers' Responses to Anti-Speeding and Anti-Drink-Driving Messages," *Transportation Research Part F: Traffic Psychology and Behaviour* 6, no. 3 (2003): 197–216.
9. Margie E. Lachman and Suzanne L. Weaver, "The Sense of Control as a Moderator of Social Class Differences in Health and Well-Being," *Journal of personality and social psychology* 74, no. 3 (1998): 763–773.
10. Ioni M. Lewis, Barry Watson, and Katherine M. White, "Response Efficacy: The Key to Minimizing Rejection and Maximizing Acceptance of Emotion-Based Anti-Speeding Messages," *Accident Analysis & Prevention* 42, no. 2 (2010): 459–467.

BIBLIOGRAPHY

- Chang, Chun-Tuan. "Health-care Product Advertising: The Influences of Message Framing and Perceived Product Characteristics." *Psychology & Marketing* 24 no. 2 (2007): 143–169. <https://doi.org/10.1002/mar.20156>
- Chang, Chun-Tuan. "Interactive Effects of Message Framing, Product Perceived Risk, and Mood—The Case of Travel Healthcare Product Advertising." *Journal of Advertising Research* 47 no. 1 (2007): 51–65. doi: 10.2501/S0021849907070067
- Gerend, M. A., and Margaret Cullen. "Effects of Message Framing and Temporal Context on College Student Drinking Behavior." *Journal of Experimental Social Psychology* 44 (2008): 1167–1173. <https://doi.org/10.1016/j.jesp.2008.02.007>
- Glendon, A. Ian, and Britta L. Walker. "Can Anti-speeding Messages Based on Protection Motivation Theory Influence Reported Speeding Intentions?" *Accident Analysis & Prevention* 57 (2013): 67–79. doi: 10.1016/j.aap.2013.04.004
- Glendon, A. Ian, and Lorenzo Cernecca. "Young Drivers' Responses to Anti-Speeding and Anti-Drink-Driving Messages." *Transportation Research Part F: Traffic Psychology and Behaviour* 6, no. 3 (2003): 197–216. [https://doi.org/10.1016/S1369-8478\(03\)00026-3](https://doi.org/10.1016/S1369-8478(03)00026-3)
- Lachman, Margie E., and Suzanne L. Weaver. "The Sense of Control as a Moderator of Social Class Differences in Health and Well-Being." *Journal of Personality and Social Psychology* 74, no. 3 (1998): 763–773. doi: 10.1037/0022-3514.74.3.763
- Lewis, Ioni M., Barry Watson, and Katherine M. White. "Response Efficacy: The Key to Minimizing Rejection and Maximizing Acceptance of Emotion-Based Anti-Speeding Messages." *Accident Analysis & Prevention* 42, no. 2 (2010): 459–467. <https://doi.org/10.1016/j.aap.2009.09.008>
- Lewis, Ioni, Barry Watson, and Richard Tay. "Examining the Effectiveness of Physical Threats in Road Safety Advertising: The Role of the Third-Person Effect, Gender, and Age." *Transportation Research Part F: Traffic Psychology and Behaviour* 10, no. 1 (2007): 48–60. <https://doi.org/10.1016/j.trf.2006.05.001>
- Rothman, A. J., Roger D. Bartels, Jhon Wlaschin, and Peter Salovey. "The Strategic Use of Gain- and Loss-Framed Messages to Promote Healthy Behavior: How Theory Can Inform Practice." *Journal of Communication* 56 (2006): 202–220. <https://doi.org/10.1111/j.1460-2466.2006.00290.x>
- Tay, Richard, and Alex De Barros. "Effectiveness of Road Safety Messages on Variable Message Signs." *Journal of Transportation Systems Engineering and Information Technology* 10, no. 3 (2010): 18–23. [https://doi.org/10.1016/S1570-6672\(09\)60040-4](https://doi.org/10.1016/S1570-6672(09)60040-4)

Williams, Patti, and Aimee Drolet. "Age-Related Differences in Responses to Emotional Advertisements." *Journal of Consumer Research* 32, no. 3 (March 2005): 343–354. <https://doi.org/10.1086/497545>

Wu, Wann-Yih, Cho Thwe Linn, Chen-Su Fu, and Badri Munir Sukoco. "The Role of Endorsers, Framing, and Rewards on the Effectiveness of Dietary Supplement Advertisements." *Journal of Health Communication* 17, no. 1 (January 2012): 54–75. doi: 10.1080/10810730.2011.585689.

ABOUT THE AUTHOR

SAMER SAROFIM

Dr. Samer Sarofim is an award-winning marketing scholar and educator. He is a Faculty Fellow at Fresno State Transportation Institute and an Assistant Professor of Marketing at Craig School of Business, California State University Fresno. His research was honored by the Best Paper Award in Consumer Behavior Track at the American Marketing Association Summer conference. Sarofim is also the recipient of Pearson Education Michael Solomon Consumer Behavior Best Paper Award and the Society for Marketing Advances Conference, Retailing Track Best Paper Award. Dr. Sarofim's research appeared in multiple prestigious academic journals, including the Journal of Business Research and Marketing Letters.

Dr. Sarofim holds a Ph.D. in Business Marketing from The University of Kansas. He also holds an MBA from the American University in Cairo, including a semester at George Washington University in Washington, D.C. His bachelor's degree in Pharmaceutical Sciences was granted by Ain Shams University.

PEER REVIEW

San José State University, of the California State University system, and the Mineta Transportation Institute (MTI) Board of Trustees have agreed upon a peer review process required for all research published by MTI. The purpose of the review process is to ensure that the results presented are based upon a professionally acceptable research protocol.

MTI FOUNDER

Hon. Norman Y. Mineta

MTI BOARD OF TRUSTEES

Founder, Honorable Norman Mineta (Ex-Officio)
Secretary (ret.),
US Department of Transportation

Chair, Abbas Mohaddes (TE 2021)
President & COO
Econolite Group Inc.

Vice Chair, Will Kempton (TE 2022)
Retired

Executive Director, Karen Philbrick, PhD (Ex-Officio)
Mineta Transportation Institute
San José State University

Richard Anderson (Ex-Officio)
President & CEO
Amtrak

David Castagnetti (TE 2021)
Co-Founder
Mehlman Castagnetti
Rosen & Thomas

Maria Cino (TE 2021)
Vice President
America & U.S. Government
Relations Hewlett-Packard Enterprise

Grace Crunican* (TE 2022)
Retired

Donna DeMartino (TE 2021)
General Manager & CEO
San Joaquin Regional Transit District

Nuria Fernandez* (TE 2020)
General Manager & CEO
Santa Clara Valley
Transportation Authority (VTA)

John Flaherty (TE 2020)
Senior Fellow
Silicon Valley American
Leadership Form

Rose Guilbault (TE 2020)
Board Member
Peninsula Corridor
Joint Powers Board

Ian Jefferies (Ex-Officio)
President & CEO
Association of American Railroads

Diane Woodend Jones (TE 2022)
Principal & Chair of Board
Lea + Elliott, Inc.

Therese McMillan (TE 2022)
Executive Director
Metropolitan Transportation
Commission (MTC)

Bradley Mims (TE 2020)
President & CEO
Conference of Minority
Transportation Officials (COMTO)

Jeff Morales (TE 2022)
Managing Principal
InfraStrategies, LLC

Dan Moshavi, PhD (Ex-Officio)
Dean, Lucas College and
Graduate School of Business
San José State University

Takayoshi Oshima (TE 2021)
Chairman & CEO
Allied Telesis, Inc.

Toks Omishakin (Ex-Officio) Director
California Department of
Transportation (Caltrans)

Paul Skoutelas (Ex-Officio)
President & CEO
American Public Transportation
Association (APTA)

Dan Smith (TE 2020)
President
Capstone Financial Group, Inc.

Beverly Swaim-Staley (TE 2022)
President
Union Station Redevelopment
Corporation

Jim Tymon (Ex-Officio)
Executive Director
American Association of
State Highway and Transportation
Officials (AASHTO)

Larry Willis (Ex-Officio)
President
Transportation Trades
Dept., AFL-CIO

(TE) = Term Expiration
* = Past Chair, Board of Trustees

Directors

Karen Philbrick, Ph.D.
Executive Director

Hilary Nixon, Ph.D.
Deputy Executive Director

Asha Weinstein Agrawal, Ph.D.
Education Director
National Transportation Finance
Center Director

Brian Michael Jenkins
National Transportation Security
Center Director

Research Associates Policy Oversight Committee

Jan Botha, Ph.D.
Civil & Environmental Engineering
San José State University

Katherine Kao Cushing, Ph.D.
Environmental Science
San José State University

Dave Czerwinski, Ph.D.
Marketing and Decision Science
San José State University

Frances Edwards, Ph.D.
Political Science
San José State University

Taeho Park, Ph.D.
Organization and Management
San José State University

Christa Bailey
Martin Luther King, Jr. Library
San José State University

