



THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

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COMMUNICATION STUDIES
BEHAVIORAL SCIENCES

EXAMINATION COMMITTEE
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DOCUMENT NUMBER
FINAL VERSION -

Abstract

The primary objective of this study was to examine the effect of tailored messages to individual differences in motivational orientation on attitudes and intentions towards active work commuting by electrically assisted bicycles (EAB). The underlying objective was to develop an approach for enhancing message persuasiveness in health communication. Based on regulatory focus theory, it was predicted that a fit between the strategically used framing method and people's chronic regulatory focus would result in higher intentions and more positive thoughts and feelings about active work commuting by EAB. Moreover, it was expected that people who experienced a regulatory fit had a more positive attitude and a higher buying intention of an EAB. The tailored messages were presented among four different risk-reduction conditions and the psychological risk reduction condition appeared to be the most effective. The expected regulatory fit effect was only found in the financial risk reduction. However, the interaction showed a contrasting relation in which a regulatory non-fit resulted in a higher advertisement evaluation, more positive feelings about active work commuting by EAB, a more positive attitude towards EAB and a higher buying intention of an EAB. The results show that regulatory fit is probably not always or solely the moderator of message framing effects. Involvement and motivational to process information are possible important factors that moderate regulatory (non)fit effects.

Keywords: health communication, message framing, regulatory focus theory, active work commuting, electrically assisted bicycle

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

Abstract (in Dutch)

Het primaire doel van deze studie was om te onderzoeken of boodschapformulering gericht op individuele verschillen in motivationele oriëntatie invloed heeft op de attitudes en intenties met betrekking tot forenzen per elektrische fiets. Het onderliggende doel was om een methode te ontwikkelen die de overtuigingskracht van gezondheidscommunicatie vergroot. Op basis van regulatory focus theory werd verwacht dat een match tussen de strategisch gekozen boodschapformulering en de wijze waarop mensen doelen nastreven (regulatory focus) zou resulteren in hogere intenties en meer positieve gedachten en gevoelens over forenzen per elektrische fiets. Daarnaast werd verwacht dat mensen die een 'regulatory fit' ervoeren, een meer positieve houding en een hogere aankoopintentie met betrekking tot een elektrische fiets hadden. De gemanipuleerde boodschappen werden toegepast op vier verschillende risico verminderende condities, waarbij de slogan die de nadruk legde op het verminderen van het psychologische risico het meest succesvol bleek. Het verwachte 'fit-effect' werd alleen in de conditie met de financiële risico verminderende slogan gevonden, waarbij de interactie overigens tegenovergesteld bleek te zijn. Concreet betekent dit dat slogans die incongruent waren aan de motivationele oriëntatie van mensen, leidden tot meer positieve gevoelens over forenzen per elektrische fiets, een betere houding ten opzichte van elektrische fietsen en een hogere aankoopintentie van een elektrische fiets. De resultaten impliceren dat regulatory fit waarschijnlijk niet de enige modererende factor is op boodschapformulering. Betrokkenheid en motivatie om informatie te verwerken zijn mogelijke belangrijke factoren die regulatory (non)fit effecten modereren.

Keywords: gezondheidscommunicatie, boodschapformulering, regulatory focus theory, forenzen, elektrische fiets

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

Executive summary

By support of Royal Dutch Gazelle, the current study examined the effect of tailored messages to individual differences in motivational orientation on attitudes and intentions towards active work commuting by electrically assisted bicycles (EAB). The underlying objective from a practical point of view was to develop a method for effective (health) communication in advertisements.

Based on regulatory focus theory, it was predicted that a fit between the strategically used message framing method and people's chronic regulatory focus would result in higher intentions and more positive thoughts and feelings about active work commuting by EAB. Moreover, it was expected that people who experienced a regulatory fit had a more positive attitude and a higher buying intention of an EAB.

Three hundred and thirty-seven (N= 337) filled in the online questionnaire. All participants were randomly allocated to the advertisement in one of the four risk reduction conditions (i.e., financial-, physical-, time- or psychological risk reduction condition) which contained a visual, logo and gain- or loss- framed slogan encouraging participants to participate in active work commuting by EAB. The expected regulatory fit effect was only found in the financial risk reduction, but the interaction showed a contrasting relation in which a regulatory non-fit resulted in a higher advertisement evaluation, more positive feelings about active work commuting by EAB, a more positive attitude towards EAB and a higher buying intention of an EAB. In fact, this means that when the objective is to communicate about financial issues related to active work commuting, it is important to know the predominantly regulatory focus of the target group. Promotion oriented people are more persuaded by a loss-framed slogan and prevention oriented people by a gain-framed slogan.

Between all four risk reduction conditions, the psychological risk reduction condition appeared to be the most effective. Concretely it means for Gazelle that the best way of

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

persuading people to commute by bicycle is to use slogans that focus on psychological feelings and benefits. Furthermore, the gain-framed slogans were more persuasive with respect to advertisement evaluation. Therefore, it is recommended to formulate slogans in advertisements in terms of gains when the objective is to create a more believable, informative and interesting advertisement. Finally, a relevant effect regarding gender was found on attitude towards EABs. Women appear to have a more positive attitude towards EABs than men. Since most of the EABs currently are also sold to women, is it recommended to focus in advertisements on the most potential target group: men.

It should be noted that the importance of future research in exploring motivations in active work commuting behavior is essential, considering the health- and environmental consequences of commuting by motorized transportation modes. Future research should aim to extend the knowledge of regulatory non-fit effects and the underlying factors that moderate these effects on persuasion. This can be realized by for example generalizing and extending the current study. The use of a different participant sample, improved framing manipulation, induced regulatory focus (i.e., compared to measuring chronic regulatory focus), involvement and motivation to process information as moderating factors are examples of relevant adjustments, for both science and marketing management of organizations.

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

An important way to enhance public health is by increasing physical activity. The relationship between physical activities in different domains and health indicators such as body mass index has been positively confirmed by several studies over the years (Morrison, Petticrew & Thomson, 2002; Abu-Omar & Rütten, 2008; Vuori, 1998; Haskell, Lee, Pate, Powell, Blair, Franklin, Macera, Heath, Thompson & Bauman, 2007). However, the amount of people with overweight or even obesity is still rising (Schokker, Visscher, Nooyens, van Baak & Seidell, 2006) and research shows that adults are still not active enough (Haskell et al., 2007). Specifically in the Netherlands, it turns out that less than half of the adult population meets the recommendations for adequate physical activity (Kemper, Ooijendijk & Stiggelbout, 2000). In combination with unhealthy lifestyles physical inactivity remains an urgent public health issue (Haskell et al., 2007; Simons, van Es & Hendriksen, 2009).

The potential of improving public health by physical activity has been called substantial (Vuori, 1998) and is also known as health-enhancing physical activity (HEPA). HEPA is defined by Oja, Vuori and Paronen (1998, p.87) as “accumulation of 30 minutes or more of moderate-intensity exercise on most, or preferably all days, of the week”. There are several domains in which HEPA can take place, such as leisure time, occupational time, domestic time and during commuting (Abu-Omar & Rütten, 2008). Oja et al. (1998) state that incorporating physical activity into people’s daily life routine is the best way to realize substantial public health-enhancement. The combination of daily life routine and the potential to make two daily activity bouts makes the domain of active work commuting (e.g., walking, cycling) an important and interesting domain to increase public health.

Since cycling is performed at a higher relative intensity, it became more effective in improving health compared to walking (Oja et al., 1998). Moreover, cycling enables people to overcome a longer distance than walking. On average 50% of all car trips in the European

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

Union member countries are shorter than five kilometers (Titze, Stronegger, Janschitz & Oja, 2008) and thus having a great potential to be travelled by bicycle. Despite a bicycle-friendly infrastructure and a positive image of cycling, even in the Netherlands exists a large group who decides not to cycle in these situations (Heinen, van Wee & Maat, 2010). A relatively new device that can help people to meet the guidelines for sufficient physical activity is the electric bicycle (Simons et al., 2009).

Electric bicycles can be described as “electric motor powered bicycles, including as well fully as partially motor powered bicycles” (Muetze & Tan, 2005, p.2865). The partially motor powered bicycles are also called electrically assisted bicycles (EABs) (Simons et al., 2009) and have a lot of potential in the Netherlands to grow as an alternative way of commuting since this type of electric bicycle is most common in the Netherlands and requires also human physical activity (Muetze & Tan, 2005). Opposed to regular bicycling, electric bicycling by EAB enables long distance biking in a shorter time frame without an intense effort and without resulting in uncomfortable unhygienic situations (e.g., sweat). This makes the EAB an interesting mode of transport in the domain of active work commuting. Related to the common goal to improve public health, supporting evidence is found in the study of Simons et al. (2009). Their results showed that the physical intensity during cycling on an EAB is sufficiently high enough to meet the physical activity guidelines for adults according to HEPA standards.

In order to achieve enhancement in public health, people need to be persuaded to change their (commuting) behavior. Morrison et al. (2003) state that health promotion campaigns or programs focused on physical activity are the most effective transport interventions to improve health and change behavior. However, message impact still needs further development to improve the effectiveness of future health promoting campaigns. The current study examines the effect of tailoring messages to individual differences in

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

motivational orientation on attitudes and intentions towards active work commuting by electrically assisted bicycles. The underlying objective is to develop an approach for enhancing message persuasiveness in health communication.

Message framing as a behavior change strategy

There are many approaches that focus on health behavior modification. One major form that uses theoretical frameworks to inform and persuade both individuals and communities about health-enhancement activities is health communication (Myers, 2010). Noar (2006) states that a targeted and well-executed health mass media campaign can contribute to improve knowledge of (health) issues and to change attitudes and beliefs towards a certain behavior. Moreover, it will support behavioral change. Although there are many factors of importance by conducting a mass media campaign, one of the most important elements of the communication campaign is the way a message is tailored (Noar, 2006). Message tailoring is a “health communication strategy that involves the customization of information and intervention to best fit the characteristics and needs of specific target populations or individuals” (Kreuter & Wray, 2003, as cited in Myers, 2010, p. 501). Prior findings show that tailored health messages have more persuasive power and are more effective in behavioral change promotion, compared to general health messages that are not tailored to individual differences (Kreuter & Wray, 2003; Latimer, Katulak, Mowad & Salovey, 2005).

Message framing is a message tailoring strategy whereby information is manipulated and framed in order to influence (individual or public) behavioral decisions. This concept of framing holds that the way a message is characterized (e.g., in a communication campaign) can influence the way it is understood by the message recipients (Scheufele & Tewksbury,

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

2007). In this way it is assumed that someone's attitude, decision, intention and even behavior can change when presenting a similar message in different frames or formats. The major goal of a framing strategy is generally to promote a certain behavior (Rothman & Salovey, 1997), which can be achieved via different message framing forms. Levin, Schneider and Gaeth (1998) describe three different message framing types that all have distinctive underlying mechanisms and effects. One of these manipulations is introduced by Tversky and Kahneman (1981) and is called 'risky choice framing'. In this type of framing, the choice between a risky and a riskless outcome depends on the way they are framed. The next framing method is called 'attribute framing'. The focus point in the framing manipulation of attribute framing is on characteristics of an object or event. Finally, goal framing is associated with the framing of a certain goal of an action or behavior (Levin et al., 1998). Table 1 is adopted from Levin et al. (1998) and shows the methodological differences between risky choice-, attribute- and goal framing.

Table 1

Summary of Methodological Differences in Risky Choice, Attribute and Goal Framing

Frame type	What is framed	What is affected	How effect is measured
Risky choice	Set of options with different risk levels	Risk preference	Comparison of choices for risky options
Attribute	Object/event attributes or characteristics	Item evaluation	Comparison of attractiveness ratings for the single item
Goal	Consequence or implied goal of a behavior	Impact of persuasion	Comparison of rate of adoption of the behavior

Note. Adapted from "All frames are not created equal: A typology and critical analysis of framing effects" by Levin, I. P., Schneider, S. L., & Gaeth, G. L. (1998). All frames are not created equal: A typology and critical analysis of framing effects. *Organizational Behavior and Human Decision Processes*, 76, 149-188, p. 151)

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

Goal framing. The most applied way of framing to promote physical activity is goal framing. Goal framing is mostly applied to studies that focus on persuasive communication. Research shows that the persuasiveness of a message may depend on whether the message focuses either on the positive consequences (or gains) of performing a certain behavior or on the negative consequences (or losses) of not performing that particular behavior (Levin et al., 1998). An important and distinctive feature of goal framing manipulation is that both the gain-framed condition and the loss-framed condition aim at achieving the same desired end-state or behavior and thus representing equivalent information (Block & Keller, 1995; Levin et al., 1998). The key question in goal framing is whether the gain- or loss-framed condition has more persuasive power in convincing people to perform a certain behavior.

Due to inconsistent findings, several meta-analytic reviews were conducted in the previous years to collect, analyze and report message framing effects on health behavior in order to see whether a gain-framed or loss-framed message is more effective. Levin et al. (1998) collected the results of 28 studies with respect to goal framing and found that in general the loss-framed messages had more effect on responses compared to the gain-framed messages. An example is the well-known study from Meyerowitz and Chaiken (1987). Their study aimed to convince women to engage in breast self-examination (BSE). The results showed that women who were exposed to a loss-framed message that emphasized the negative consequences of not engaging in BSE were more likely to participate in BSE, compared to women who were exposed to information that focused on the positive consequences of BSE (i.e., gain-framed message). Support for this conclusion was also found in the study of Block and Keller (1995). They found that for low efficacy or detection behavior, the loss-framed message had more influence on attitudes and intentions than the gain-framed message. However, a more recently conducted meta-analytic review of O’Keefe and Jensen (2006) provides other insights. Across all of the 165 studies they reviewed, they

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

did not find evidence that a loss-framed message was significantly more persuasive than a gain-framed message, or the other way around. This is in line with the results of the extended study of O’Keefe and Jensen (2007) which focused specifically on disease prevention behaviors (e.g., diet/ nutrition behaviors, inoculation and exercise behaviors). They found significant advantage for gain-framed messages over loss-framed messages, but this effect was very small and applicable to only one specific form of prevention behavior (i.e., dental hygiene). Therefore, it can be concluded that it is unclear which frame, gain or loss, is more persuasive than the other (Levin et al., 1998; Myers, 2010; O’Keefe & Jensen, 2006; 2007; Rothman & Salovey, 1997).

In addition, Yan, Dillard and Shen (2010) state that if framing effects exist, they can only be understood by determining the underlying variables that moderate these effects. Theoretical models should provide more insight in the underlying processes that leads to different results in message framing. In fact, it means that the common use of only one theoretical framework is not sufficient. In order to understand why multi-theoretical frameworks should be used to explain message framing effects, the relevant theories and conceptual models regarding message framing will be discussed.

Motivational orientation

The basic principle of message framing can be found in the prospect theory. Kahneman and Tversky (1979) introduced this theory which describes how people manage risk and uncertainty in decision making. More specifically, they state that when behavioral choices involve risk or uncertainty, decision making depends on whether the choices are framed in terms of potential losses or in terms of potential gains. In this way, people tend to be more willing to seek and take risks as long the potential disadvantages or losses of a particular situation are made salient. On the other hand, when the choice is framed in terms of

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

gains, people generally tend to be risk averse and to choose the decision that avoids these risks (Kahneman & Tversky, 1979; Levin et al., 1998; Myers, 2010). Tversky and Kahneman (1981) applied this theory to the concept of framing and found in their study that when the losses were certain, most of the participants chose the risk reeking option. On the contrary, if a gain was certain, people chose the risks averse option. However, prospect theory does not adequately describe the underlying mechanisms and conditions of message framing that influence people's attitudes, beliefs and behaviors (Rothman & Salovey, 1997). For that reason, it is not possible to explain message framing effects on health-related behavior purely based on prospect theory (Levin et al., 1998; Rothman & Salovey, 1997). Multi-theoretical frameworks are necessary in order to understand the moderating factors and complexity regarding message framing effects.

Higgins (2000) states that characteristics of individuals provides most insight in the effectiveness of message framing. Related to the concept of goal framing, Higgins (2005) argues that "when people pursue a goal, they begin with some motivational orientation, some concerns or interests that directs to the goal or pursuit" (Higgins, 2005, p.1). For that reason he argues that motivation theories can be integrated with prospect theory in order to understand the underlying processes in message framing. There are several theories of motivation who state that individual behavior is regulated by two different systems: the approach system and the avoidance system (Carver, Sutton & Scheier, 2000). These systems represent people's chronic predominantly motivation style. The approach system regulates "desired" behavior towards potential good outcomes (Gray, 1981) whereas the avoidance system leads "aversive" behavior away from possible threats or bad outcomes (Gray, 1981; Carver et al., 2000). Sherman, Mann and Updegraff (2006) state that message framing interacts with the so-called predominantly motivational style that someone has. More specifically, they developed a congruency hypothesis which predicts that framed health

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

messages which are in line with motivational style are the most effective way to promote health behaviors.

Higgins (1997) examined also the approach-avoidance principle and introduced a theory of self-regulatory focus, called regulatory focus theory (RFT). RFT underlies the hedonic principle (i.e., “people are motivated to approach pleasure and avoid pain”, Higgins, 1997, p.1280) but differs radically in its motivational consequences. The theory starts with arguing that the hedonic self-regulatory principle should be applied differently when it comes to different needs (Higgins, 1997). The two different regulatory focus mechanisms are defined as promotion focus and prevention focus. According to RFT is regulatory focus the dominant motivation system which explains why people make certain decisions or show a certain behavior. The underlying thought of RFT is that self-regulation in regarding strong ideals versus strong oughts differs in regulatory focus. Ideal self-regulation concerns a focus on promotion, whereas ought self-regulation concerns a focus on prevention.

The self-regulatory orientations work separately and independently of each other and form the motive of someone’s attitudes and behaviors. Every person has a predominantly prevention- or promotion focus. According to Higgins (1997), for both information processing and motivation, people with a predominantly prevention focus respond different to a message than people with a predominantly promotion focus. For example, people with a predominantly prevention oriented focus are driven by safety, responsibility and security needs. Those people view goals as oughts and they are motivated from a strategically point of view to approach non-losses (i.e., the absence of negatives) and to stay away from bad outcomes (i.e., losses: the presence of negatives). People with the opposite dominant regulatory focus (i.e., promotion focused) are mainly motivated by hopes, accomplishments and advancement needs. For those people, goals are seen as ideals and they are strategically focused on avoiding non-gains (i.e., the absence of positives) and the approach of good

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

outcomes (i.e., gains: the presence of positives). It should be noted that both people with a promotion focus and people with a prevention focus want to achieve the desired end state and to avoid the opposite (Cesario, Higgins & Scholer, 2008). In fact, it means that as well promotion focused people as prevention focused people aim to approach success and to avoid failure. Only the way in which they represent these states is different for promotion versus prevention focused people. Finally, it is also important to note that regulatory focus is a state and for that reason, it cannot only differ between individuals (i.e., predominantly chronic regulatory focus), but can also differ between situations, which is called momentary regulatory focus. Predominantly (chronic) regulatory focus can be measured by the regulatory focus questionnaire (Higgins, Friedman, Harlow, Idson, Ayduk & Taylor, 2001). Momentary regulatory focus can be primed or induced, for example before message exposure.

Regulatory fit theory. After the well known article of Higgins (1997) about RFT, as well Higgins as other researchers conducted new studies to examine and extend the theory about regulatory focus. An important extension of RFT which has impact on the concept of message framing is regulatory fit. Regulatory fit theory is also a goal-pursuit theory but one that focuses on the relation between people's chronic regulatory focus and the strategic framing method of a message (i.e., promotion or prevention focused) (Higgins, 2000; 2005; Cesario et al., 2004). People experience a regulatory fit when both the person and the situational demands are either promotion- or prevention focused (Higgins, 2000). In this way people's focus regarding a goal can be uninterrupted (i.e., regulatory fit) or intermittent (i.e., regulatory non-fit) because of the communication strategy someone has used.

Higgins (2000) state that regulatory fit creates a feeling of rightness regarding the goal pursuit. Moreover, he suggest that regulatory fit increases task engagement (Higgins, 2000, 2005), such as

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

such as feeling right about someone's positive response after exposure to a message (Cesario, Grant & Higgins, 2004). Additionally, in high regulatory fit situations, people tend to be more strongly motivated and alert during decision making. Even after decision making, people evaluate it more positively compared to people that experienced a regulatory non-fit (Higgins, 2000). Finally, regulatory fit increases the value of people's behavior (Higgins, 2000). In that way, regulatory fit intensifies responses, such as the persuasiveness of framed message arguments (Cesario, Higgins & Scholer, 2008).

The theory is applicable to the following situation: The topic of a message focuses on a desired end state or goal for the message recipient. Accordingly, the message is framed in terms of a promotion- (i.e., aiming at avoiding non-gains or approaching gains) or prevention orientation (i.e., aiming at approaching non-losses or avoiding losses). Consequently, the framed message will sustain or disrupt the recipient's chronic motivational orientation, and will result in a regulatory fit or non-fit. Researchers used this theory to test fit predictions and found that promotion-framed arguments (focused on hopes, accomplishments or advancement needs) had a greater persuasive impact on people with a matching chronic regulatory focus (i.e., predominantly promotion focused orientation), compared to people with a predominantly prevention focused orientation. The reverse was true for prevention-framed arguments (Cesario, Higgins & Scholer, 2008).

Regulatory fit and physical health. A recent and relevant study related to regulatory fit and the enhancement of physical health is the study of Latimer, Rivers, Rench, Katulak, Hicks, Hodorowski, Higgins and Salovey (2008). They investigated to what degree messages tailored to people's promotion- or prevention-goal orientation resulted in more positive thoughts and feelings about physical activity participation. Moreover, they investigated whether a regulatory fit effect resulted in a higher participation degree in physical activity.

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

Latimer et al. (2008) measured (the by Higgins [2005] indicated) five domains that derive value from regulatory fit, which included:

“(a) increased preference for or *inclination* toward the behavior (Higgins, Roney, Crowe, & Hymes, 1994), (b) increased *motivation* to engage in behavior (Cesario, Grant, & Higgins, 2004; Shah, Higgins, & Friedman, 1998), (c) imagining feeling good about engaging in the behavior (i.e., *positive prospective feelings*; Higgins, 2000), (d) feeling good after engaging in the behavior (i.e., *positive retrospective feelings*; Freitas & Higgins, 2002), and (e) assigning a greater *value* to the behavior (e.g., perceiving the behavior as more enjoyable, more worthwhile, or worth more money; Higgins, Idson, Freitas, Spiegel, & Molden, 2003)” (Latimer et al., 2008, p. 827).

Latimer et al. (2008) used these five domains (i.e., inclination, motivation, positive prospective feelings, positive retrospective feelings and value) as indirect indicators of regulatory fit. Compared to former studies that extend their findings from laboratory-based experiments, this study was a field-based investigation within the domain of health. The findings showed that participants were more likely to participate in physical activities and had more positive feelings towards this health behavior when exposed to messages that fit their chronic regulatory focus, compared to incongruent messages that did not fit their chronic regulatory focus. This effect was particularly found in the promotion-focused condition. Moreover, the results showed that the fit-effects were mediated by positive retrospective feelings about physical activity.

From this research, it seems clear that tailored messages that fit peoples regulatory focus have a positive influence on the participation in physical activity. However, it is less clear whether these effects also apply for commuting behavior and whether the effects are

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

similar between people with different levels of physical activity. Moreover, it remains unclear if the results can be generalized to other communication designs. While Latimer et al. (2008) conducted a telephone interview where participants listened to a randomly assigned promotion-focused or prevention-focused message, the current research will focus on the development and testing of computer tailored messages. The primary goal of the current study is to generalize prior evidence of message framing and regulatory fit. More specifically, the persuasiveness of messages tailored to individual differences in regulatory focus are examined in a more specific domain of HEPA: active work commuting. Regulatory fit theory is used to predict the persuasiveness of slogans in computer tailored advertisements. Followed by the results of Latimer et al. (2008) it is expected that:

H1 a: When exposed to a gain-framed message, promoters have higher intentions and more positive thoughts and feelings about active work commuting by EAB than preventers.

b: When exposed to a loss-framed message, preventers have higher intentions and more positive thoughts and feelings about active work commuting by EAB than promoters.

Since the process of changing commuting behavior by electrically assisted bicycles does not only involve intrinsic motivation, but also the adoption and purchase of a product (i.e., an EAB), the influence of tailored messages on the consideration towards EABs is also taken into account:

H2: a: When exposed to a gain-framed message, promoters have a more positive attitude and a higher buying intention of an EAB than preventers.

b: When exposed to a loss-framed message, preventers have a more positive attitude and a higher buying intention of an EAB than promoters.

Latimer et al. (2008) used the IPAQ to screen people on physical activity and included only inactive people in their research. However, to provide a deeper understanding in different levels of physical activity among people, it is necessary to include all these levels in the current study. In general it is expected that highly active people will intent more strongly in active work commuting, but prefer to ride on a regular bicycle. Since the EAB enables people to cycle longer distances (Muetze & Tan, 2005) in shorter time frame and without resulting in uncomfortable unhygienic situations, commuting by EAB can also be of interest for active people, specifically for longer distances. Since the EAB also requires physical effort, inactive people are expected to intend only shorter trips with an EAB. For that reason the current study will also investigate if interaction effects of regulatory fit on intentions, thoughts and feelings about active work commuting by EAB can be explained (are mediated) by levels of physical activity (as defined by IPAQ).

H3: Interaction effects between regulatory focus and message framing on intentions, thoughts and feelings towards active work commuting by EAB are mediated by participants' level of physical activity.

The adoption of a new product

Since EABs and their purpose for active work commuting are relatively new, some barriers of adoption need to be taken into account. Ostlund (1974) describes the importance of the 'perceived risk' of an innovation. The consumers' perceived risks of innovations can be classified into six key dimensions of perceived risk: financial-, performance-, physical-, time-, social- and psychological risks (Stone & Gronhaug, 1993). For example, financial risk is about losing money in case of a disappointing purchase. Several studies examined the

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

influence of communicating the risks of a new product. Herzenstein, Posava and Brakus (2005) tested the adoption of a new product in relation to regulatory focus and perceived risk. Their results showed that in conditions where the perceived risks of a really new product was not made clear to consumers, promotion oriented people tend to have a higher purchase intention than prevention oriented consumers. However, in case the risks were made more noticeable, both promotion- and prevention oriented participants were similarly unwilling to buy the product.

In contrast to this ‘perceived risk’ perspective, messages can also be framed to emphasize the risks of *not* adopting the product (i.e., risk reduction strategy), which may result in a higher intention to adopt a product. This would be in line with findings from Van Bekkum, Williams and Morris (2011) about communicating barriers associated with a specific behavior, such as cycling. They state that decreasing the perceptions of barriers assists in changing individuals’ attitudes, beliefs and intentions towards carrying out that behavior change.

Heinen et al. (2010) divided the barriers to cycle into different groups: built environment (e.g., poor infrastructure, perceived insecurity), natural environment (e.g., hilliness, bad weather), socio-economic variables (e.g., personal- and household characteristics), psychological factors (e.g., attitudes, social norms, habits) and aspects related to costs, time, physical effort and safety. (Heinen et al., 2010; Oja et al., 1998; Pucher & Dijkstra, 2003). Several barriers or dimensions *not* to cycle are related to the perceived risk dimensions of adopting a new product. For example, the expense of buying a bike is a barrier to cycle (Van Bekkum, Williams & Morris, 2011), but also a perceived risk dimension in adopting a new product (Stone & Gronhaug, 1993). Other perceived risk dimensions of adopting a new product related to barriers to cycle are physical risk (*related to physical*

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

effort), time risk (*related to time barrier*) and psychological risk (*related to psychological barriers*).

Based on existing literature it is suggested to use risk reduction slogans aligned with barriers to cycle, because this will assist in changing individuals' attitudes, beliefs and intentions towards active work commuting by EAB. In the current research, therefore, the gain- and loss-framed slogans will be applied to four different risk reduction dimensions. This is particularly interesting since most prior studies related to the enhancement of public health focus on physical costs/benefits in the messages that they examine. For example, it may be possible that people are more triggered and persuaded to participate in active work commuting when reading a message related to financial costs/benefits instead of a message related to physical costs/benefits. In that case the same goal (enhancing public health by active work commuting) will be achieved by only communicating in the most persuasive dimension, which may be other than the physical health dimension. The results of this part of the study will indicate whether communicating a financial-, physical-, time- or psychological risk reduction slogan is more persuasive in both participation intentions of active work commuting and purchase intentions of an electric bicycle.

Research design. In conclusion, it is expected that high levels of fit lead to enhancement of message persuasiveness and product adoption. In order to achieve the objectives of the current study, risk reduction condition, message framing, regulatory focus, and level of physical activity were included as independent variables in the design. A 4 (risk reduction slogan: financial vs. physical vs. time vs. psychological) x 2 (frame of slogan: gain vs. loss) x 2 (regulatory focus: promotion vs. prevention) between-subjects design was used. A regulatory focus x frame interaction would provide further support that regulatory focus moderates framing effects (H1+2). The four different risk reduction dimensions would provide insight whether the context of the slogans have an influence on the framing effects.

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

Furthermore, a separate analysis with level of physical activity (low vs. moderate vs. high) may provide support that level of physical activity moderates the framing effects in active work commuting behavior (H3).

Method

Participant characteristics

All participants were recruited by Royal Dutch Gazelle, a bicycle manufacturer and market leader in the Dutch bicycle industry. Gazelle produces per year around 250.000 bicycles, of which approximately 30.000 EABs (*GfK*, 2011). An e-mail with the invitation to participate in an online survey was sent to a sample of 9.971 potential participants, who were randomly selected from the customer database of Gazelle. The database included a wide range of different stakeholders of Gazelle, among others customers who bought a bicycle, people who requested a brochure and people who signed up for the newsletter of Gazelle. Similar to the study of Werth & Förster (2007), participants were informed that the goal of the study was to learn something about consumers and to obtain product evaluations. Furthermore, participants were told that the survey was related to commuting behavior and that this information was necessary for Gazelle in order to meet the needs of customers. As a reward for their participation, they had a chance to win a bicycle. Participants were able to fill in the questionnaire on every location, as long as there was internet connection.

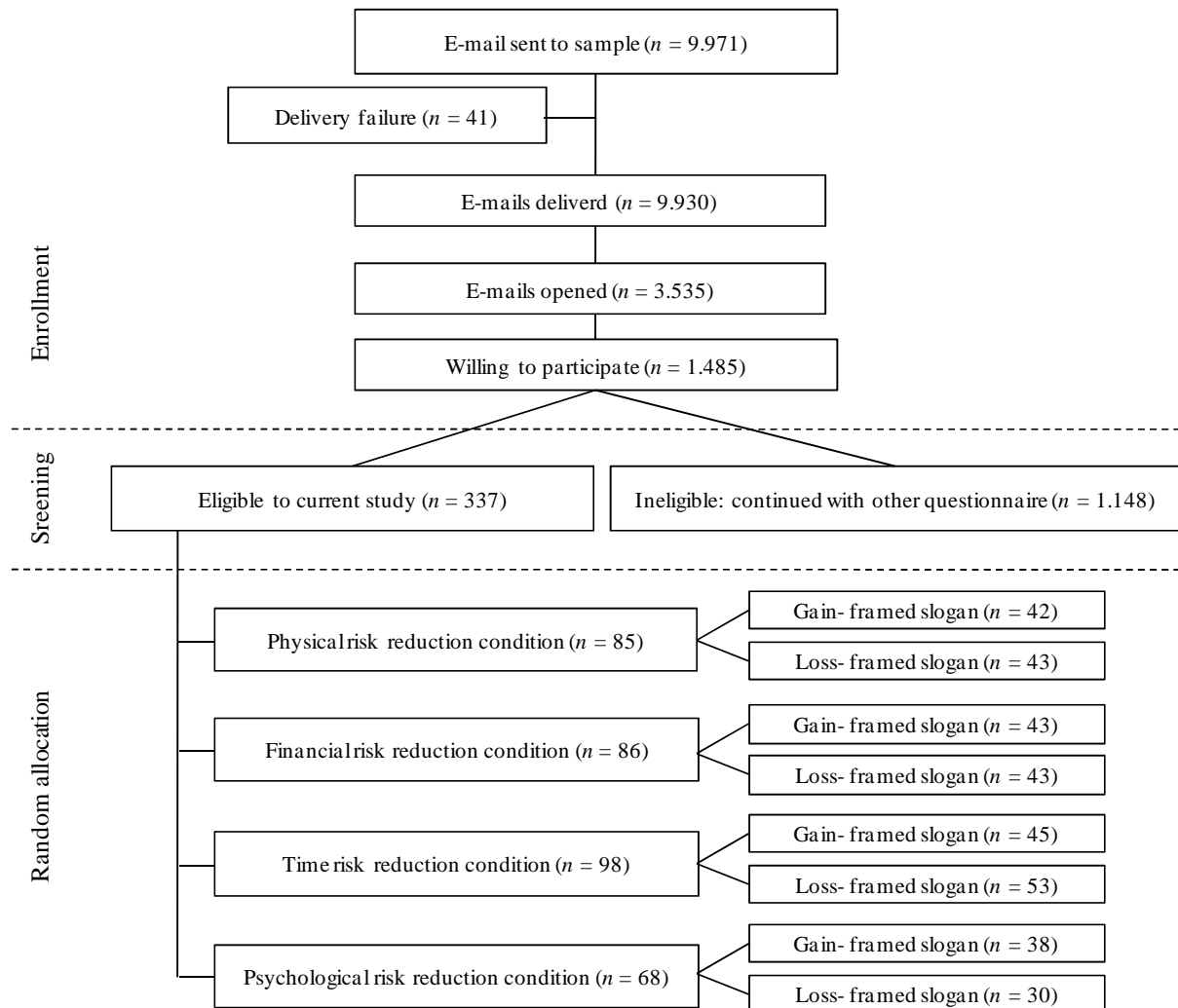
In total, 1.485 people were willing to participate in the survey (response rate = 15%). However, only eligible participants filled in the questionnaire for this study. Selection criteria included whether or not the participant was a commuter (only commuters passed through) and what their main mode of transportation was. Commuters by either a bicycle or electric bicycle were excluded from this study since it was the aim to convince people who are currently not cycling for the major part of their trip to work. Participants who were not

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

eligible for this study continued with another (satisfaction) questionnaire of Gazelle, which is not covered by this study. Accordingly, participants were randomly assigned to one of the four risk reduction conditions, with either a gain- or loss-framed slogan. Figure 1 shows the sampling and flow of participants through the survey.

Figure 1

Sampling and Flow of Participants Through the Survey



Finally, three hundred and thirty-seven (N = 337) participants (187 male, 150 female) filled in the questionnaire for this study. Most of them had a fulltime job (60%) and were

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

predominantly highly educated (i.e., HBO or university; 57%), which is above the Dutch average (i.e., 34% of the labor force, Centraal Bureau voor de Statistiek, 2012). The average age of the sample was 43.83 years ($SD = 10.48$), varying between 22 and 71. Almost all participants had a moderate (43%) or high (50%) level of physical activity. As a consequence of that, no reliable outcomes can be reported for people low in physical activity. Regarding the different risk reduction conditions and different message framing conditions, there were no significant differences in demographic characteristics and baseline physical activity. Table 2 shows an overview of all participant characteristics.

Table 2

Participant Characteristics

	<i>n</i>	<i>%</i>		<i>n</i>	<i>%</i>
Gender			Occupation		
Male	187	56	Fulltime job	201	60
Female	150	45	Parttime job	101	30
Age			Entrepreneur	12	4
15-25	11	3	Housewife/-man	1	0.3
26-44	165	49	Unemployed	4	1
45-64	152	45	Retired	10	3
65+	9	3	Student	5	2
Household structure			Others	4	1
Live alone	40	12	Level of Physical Activity		
Live together with parents/carers	8	2	Low	24	7
Live together with partner	91	27	Moderate	144	43
Live together with partner and children	185	55	High	169	50
Live together with children	11	3	Mode of transport		
Live together with other people	1	0.3	Car	247	73
Others	1	0.3	Motorcycle, -bike or scooter	9	3
Educational level ^a			Public transport (e.g., train, bus)	58	17
Primary school	1	0.3	Others (i.e., combination)	23	7
VMBO/MAVO/LBO	32	10	Possession bicycle		
MBO	91	27	Yes	327	97
HAVO/VWO	22	7	No	10	3
HBO	136	40			
University	55	16	Total	337	100

Note. ^a Dutch educational level

Experimental manipulations

Similar to the study of Latimer et al., (2008) a pilot study was conducted to review and test the gain- and loss-framed manipulation of the framed slogans in the advertisements. In total, twenty-three respondents ($N = 23$; 56% female; 44% male; $M_{age} = 29.70$; $SD = 9.30$ years) were randomly assigned to one of the two experimental conditions (i.e., gain- or loss-framed advertorial). The two advertisements had the same visual and included the same neutral information (i.e., product specifications), which was based on Werth & Förster (2007). The only difference was the framing method of the slogan, which was either gain-framed or loss-framed. 12 Respondents evaluated the gain-framed message and 11 respondents evaluated the loss-framed message. As expected, the gain-framed message was evaluated significantly higher in emphasizing the benefits of commuting by EAB on physical health ($M_{gain} = 4.33$) as opposed to the loss-framed condition ($M_{loss} = 3.27$, $t(21) = 2.84$, $p < .05$). The mean scores showed on the other hand that the loss-framed messages were evaluated significantly higher in emphasizing the risks of not commuting by EAB ($M_{loss} = 3.18$), compared to the gain-framed condition ($M_{gain} = 2.00$, $t(21) = -2.29$, $p < .05$). Respondents were also asked to report what according to them, the key message of the advertorial was. It turns out that the neutral information distracted too much from the main message. For that reason, the neutral information in the advertisement was excluded in the main study to make sure the focus was only on the key message.

In doing so, the advertisements in the actual experiment were also created by presenting the same message in different formats. Core information was consistent across conditions, along with the same visual and logo. Differences appeared only in the way the message was framed (i.e., gain- or loss- framed) and in risk reduction dimensions (i.e., physical-, financial-, time- or psychological dimension). Gain- and loss-framed messages about active work commuting by electric bicycle were manipulated simultaneously through

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

textual slogans (Schneider, Salovey, Pallonen, Mundorf, Smith & Steward, 2001). These slogans were formulated with assistance of communication professionals from the marketing & communication department of Gazelle. Table 3 shows all (translated) gain- and loss-framed slogans (see Appendix C for the original advertisements with Dutch slogans) for each of the risk reduction condition and Figure 2 shows two of these original advertisements. Immediately after exposure to the manipulated advertisement, participants filled in two questions to check the manipulation of gain and loss framing. Similar to the pilot test, the results confirmed the intended manipulation. The gain-framed messages were evaluated significantly higher in emphasizing the benefits of commuting by EAB ($M_{gain} = 4.15$) as opposed to the loss-framed conditions ($M_{loss} = 3.26$, $t(335) = -7.017$, $p < .01$). On the opposite, the loss-framed messages were evaluated significantly higher in emphasizing the risks of not commuting by EAB ($M_{loss} = 3.14$) compared to the gain-framed condition ($M_{gain} = 2.26$, $t(335) = 4.579$, $p < .01$).

Table 3

Translated Gain- and Loss-framed Slogans of Manipulated Advertisements

Risk reduction condition	Gain-framed slogans	Loss-framed slogans
Physical	Commuting by electrically assisted bicycle increases your physical fitness and thus makes you healthier	Not commuting by electrically assisted bicycle decreases your physical fitness and thus lowers your health
Financial	You will gain a lot of money by commuting with electrically assisted bicycle	Not commuting by electrically assisted bicycle will cost you a lot of money
Time	You will gain time when you commute by electrically assisted bicycle in urban area's with traffic congestion	Not commuting by electrically assisted bicycle will cost you more time in urban area's with traffic congestion
Psychological	Commuting by electrically assisted bicycle provides you a good feeling about the start of your day!	Not commuting by electrically assisted bicycle worsens your feeling about the start of your day!

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

Figure 2

Original Gain- and Loss-framed Advertisements in Physical Risk Reduction Condition



Procedure

The online survey was conducted by means of a professional online survey program (MWM2). This program made sure every question was filled in before answering the next question, so no missing values appeared. Moreover, it was not possible to return to the previous page. The first part of the survey was a short screening, based on current commuting behavior. Eligible participants (commuters, who currently not commute by bicycle or EAB) continued with the second part of the survey, which included the other independent variables (i.e., RFQ & IPAQ). Accordingly, they were randomly allocated to one of the four advertisements (financial, physical, time or psychological) with either a gain- or loss-framed slogan encouraging to participate in active work commuting by EAB. Similar to the study of Lee and Aaker (2004), participants were told to view the advertisement as they were viewing it on a website or in a magazine. They were exposed to the advertorial as long as they needed for reading and understanding the message. After exposure, the depending variables (i.e., outcome variables) were measured.

Measures

Most of the independent and dependent variables were adopted from prior studies. The article of Titze et al. (2008) formed the basis for the demographic characteristics measured in this study.

Independent variables. *Regulatory focus* was assessed using the 11-item Regulatory Focus Questionnaire (RFQ; Higgins et al., 2001). A translated version of the original RFQ was adopted from Zomerdijk (2012). Participants rated their subjective histories of promotion and prevention success on a 5-point scale (1 = never; 5 = very often). Examples of the questions that the scale included were: “How often did you obey rules and regulations that were established by your parents?” and “I feel like I have made progress toward being successful in my life”. Six questions were related to promotion focus ($\alpha = .67$) and five items were related to prevention focus ($\alpha = .75$). According to Higgins et al. (2001), as well the subscale for promotion focus as the subscale for prevention focus have adequate test-retest reliability and appropriate validity. For that reason, the scale remained similar to the original. Identical to Higgins et al. (2001), the difference between the scores on the promotion subscale and the scores on the prevention subscale served as indicator of predominant regulatory focus.

Physical activity was assessed using the self-reported short form of the International Physical Activity Questionnaire (IPAQ questionnaire, 2012) Using the short-form was easier to administer and relatively undemanding for participants. This was of major importance regarding the overall length of the entire questionnaire. The scale assesses the frequency and duration of walking and moderate- and vigorous-intensity physical activities over the last 7 days. The output of the questionnaire is information on so called metabolic equivalents (METs), which serves as an indicator of physical activity related energy expenditure (Abu-

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

Omar & Rütten, 2008). The total weekly physical activity was calculated by weighting the scores (i.e. number of minutes per week) within each category using the category-specific metabolic equivalents. Based on the IPAQ protocol (IPAQ guidelines, 2012), participants were categorized in three levels of physical activity: high level of physical activity, moderate level of physical activity and low level of physical activity.

Dependent variables. The first measured outcome variables is persuasion, as assessed among four categories: advertisement evaluation, motivation to participate in active work commuting, positive prospective feelings about commuting by EAB and perceived goal value. The second outcome variable is adoption, which was measured by attitude towards EABs and buying intentions of an EAB.

Advertisement evaluation was measured by the extent to which participants found the physical activity message believable, informative and interesting (Latimer et al., 2008) by using a 1 (not at all) to 5 (extremely) scale ($\alpha = .85$). *Motivation* was measured by asking participants to what extent they agreed with the statement: “I will try (I intent) to participate in active work commuting by bicycle for at least three times per week”. Rating scores were from 1 (strongly disagree) to 5 (strongly agree) (Latimer et al., 2008). *Prospective feelings* and *perceived goal value* were analyzed collectively since the results of the factor analysis of all value from fit variables showed one factor for all these items. Feelings associated with engaging in active work commuting by EAB were assessed using four bipolar pairs, rated on a 5-point-scale (unpleasant-pleasant, not enjoyable-enjoyable, stressful-relaxing, extremely worthless-extremely valuable), $\alpha = .88$ (Latimer et al., 2008).

Attitude towards EABs was measured by five items based on the study of Werth and Förster (2007) ($\alpha = .831$). First of all, participants rated on a scale of 1 (not at all) to 5 (extremely) the extent to what they thought an EAB was attractive, interesting and safe.

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

Secondly, participants evaluated the expected quality and satisfaction with the product in everyday life, also on 5-point scales (very poor quality-very good quality, not satisfied at all - very satisfied).

Buying intention EAB was measured using two items in the form, “During the next 12 [24] months, what do you think the chances are that you or someone in the household will buy an electrically assisted bicycle?” (Juster, 1966), $r = .89$. Chances were measured on a scale from 1 (no change/almost no change) to 7 (certain/practically certain). See Appendix A and B for both the original (Dutch) questionnaire and the English questionnaire.

Results

Main effects

First of all, separate analyses were conducted to test main effects on advertisement evaluation, motivation to participate in active work commuting, prospective feelings of active work commuting by EAB, attitude towards EABs and buying intention of an EAB.

Framing. For slogan (i.e., gain- or loss-framed), no main effects were expected. However, the results of the ANOVA analyses showed that the gain-framed slogans resulted in significantly higher advertisement evaluations ($F(1,335) = 35.88, p < .01$). This effect was significant in all of the four risk reduction conditions, which means that all advertisements with a gain-framed slogan were evaluated as more believable, informative and interesting.

Regulatory Focus. A Pearson correlation analysis was conducted to test whether chronic regulatory focus had an effect on the outcome variables. Since predominant regulatory focus was calculated as the difference between the promotion scale and the prevention scale, scores below zero indicate a predominant prevention focus and scores above zero indicate a predominant promotion score. In this way, the correlation analysis provided insight whether higher (or lower) scores of regulatory focus resulted in different

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

outcomes on advertisement evaluation, motivation, prospective feelings, attitude of EABs or buying intention of an EAB. The correlation was significant for prospective feelings ($r = -.154$, $n = 337$, $p < .01$). Since the relation is negative, it means that people with lower scores on regulatory focus (i.e., prevention focus) had higher scores on prospective feelings with respect to active work commuting by EAB. Concretely, it means that people who are more prevention oriented have more positive feelings about engaging in active work commuting by EAB than people who are more promotion oriented.

Level of physical activity. Followed by the guidelines of the IPAQ protocol (IPAQ guidelines, 2012), people's level of physical activity was calculated. Based on that score, people were assigned to either a low, moderate or high level of physical activity. ANOVA analyses shows that differences in level of physical activity had an influence on motivation to participate in active work commuting ($F(2,334) = 5.60$, $p < .01$) and prospective feelings about active work commuting by EAB ($F(2,334) = 4.80$, $p < .01$). A post-hoc Bonferroni test shows that the effect for motivation is both significant between people low in physical activity and people high in physical activity ($F(2,334) = 4.80$, $p < .05$) and between people with a moderately level of physical activity and people with a high level of physical activity ($F(2,334) = 4.80$, $p < .05$). Regarding prospective feelings, the Bonferroni test shows that the mean difference is significant between people low in physical activity and people high in physical activity ($F(2,334) = 4.80$, $p < .05$). In other words, the results indicate that the higher the level of physical activity, the stronger the motivation is to participate in active work commuting and the more positive prospective feelings they have about commuting by EAB.

Age and gender. In order to test to what degree demographics characteristics might influence the outcome variables, age and gender were also tested in an ANOVA analysis. For gender, a main effect was found on attitude towards EABs. Women had a significant more

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

positive attitude towards EABs than men ($F(1,335) = 6.09, p < .05$), especially in the psychological risk reduction condition. With respect to advertisement evaluation, a marginally significant age effect was found. As the age of participants rises, the advertisement was seen as more believable, informative and interesting ($F(3,332) = 2.50, p < .10$).

Risk reduction condition. ANOVA analyses were conducted to test the mean scores between the different risk reduction conditions (i.e., physical- financial-, time- and psychological risk reduction). The results showed that overall, the psychological condition resulted in higher means scores (see Table 4). However, the differences between the conditions were only significant for buying intentions ($F(3,333) = 5.99, p < .01$).

Table 4

Mean Scores between all Risk Reduction Conditions

	Physical	Financial	Time	Psychological
Evaluation of ad	M = 3.19, SD = .89	M = 2.96, SD = .87	M = 3.06, SD = .89	M = 3.14, SD = 1.03
Motivation	M = 2.62, SD = 1.46	M = 2.65, SD = 1.54	M = 2.58, SD = 1.53	M = 2.96, SD = 1.47
Prospective feelings	M = 3.90, SD = .94	M = 3.88, SD = .91	M = 3.80, SD = .76	M = 4.00, SD = 1.03
Attitude EAB	M = 3.71, SD = .82	M = 3.74, SD = .74	M = 3.75, SD = .76	M = 3.94, SD = .81
Buying intention EAB	M = 2.43, SD = 1.59	M = 2.13, SD = 1.42	M = 2.46, SD = 1.66	M = 3.24, SD = 1.99

Hypothesis testing

In order to test the first two hypotheses regarding interaction effects of regulatory fit between regulatory focus and framing method, separate hierarchical regression analyses were conducted according to the procedure of Fitzsimons (2008). Fitzsimons (2008) argues that, when measuring an independent variable such as self-control (or in the current study regulatory focus), it is not appropriate anymore to dichotomize this variable. As example for the current study, dichotomizing would mean that a median split analysis is performed on the

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

dataset and a new variable is created and called “promotion oriented” by scores on the RFQ that are above the median. On the other hand are scores below the medium of the RFQ coded as “prevention oriented”. The next step would then be a two-by-two between-subjects ANOVA analysis. The main problem with this method is the fact that it could lead to misinterpretations of the hypothesized relationships. Fitzsimons (2008) states that the correct approach would be to “regress the dependent variable on the continuous independent variable, the manipulated independent variable and their interaction” (Fitzsimons, 2008, p.6). In the current study, the independent variables were regulatory focus, message framing and the interaction between those variables. Accordingly, the statistical test is the slope of regulatory focus on the ‘framing’ level of the manipulated independent variable (Fitzsimons, 2008).

In this way, regulatory focus was prior to conducting the analyses, zero-centered and experimental condition was dummy-coded (loss message = -1, gain message = 1). To interpret the Message Framing x Regulatory Focus interaction, two restructured regression equations were calculated. The relationship between regulatory focus and the outcome variable was statistically examined by conducting a so-called spotlight analysis at one standard deviation below the mean of the regulatory focus score (i.e., predominantly prevention focused people) and one standard deviation above the mean of the regulatory focus score (i.e., predominantly promotion oriented people) (Fitzsimons, 2008; Latimer et al., 2008). According to Fitzsimons (2008, p.7) is the statistical test for differences across gain- and loss-framed conditions is given by the parameter and significance of the dummy variable in the regression equation. In this way, the results indicated whether a gain- or loss-framed slogan influenced the dependent scores for promotion or prevention oriented people and to what degree the scores between the gain- and loss-framed conditions differ from each other.

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

Finally, the interaction effect was visualized by plotting a graph using the unstandardized beta weights (i.e., prevention oriented versus promotion oriented variables).

Overall effects. First of all, interaction effects were measured regardless of the experimental risk reduction conditions (i.e., all four risk reduction conditions). For each of the outcome variables (i.e., advertisement evaluation, motivation, prospective feelings, attitude EAB and buying intention) separate regression models were conducted with independent variable regulatory focus, the dummy variable for gain- or loss-framed condition and their interaction. However, in contrast with the formulated hypothesis, neither for advertisement evaluation, motivation, attitude towards EAB or buying intention of an EAB the regression model was significant and no interaction effects were found.

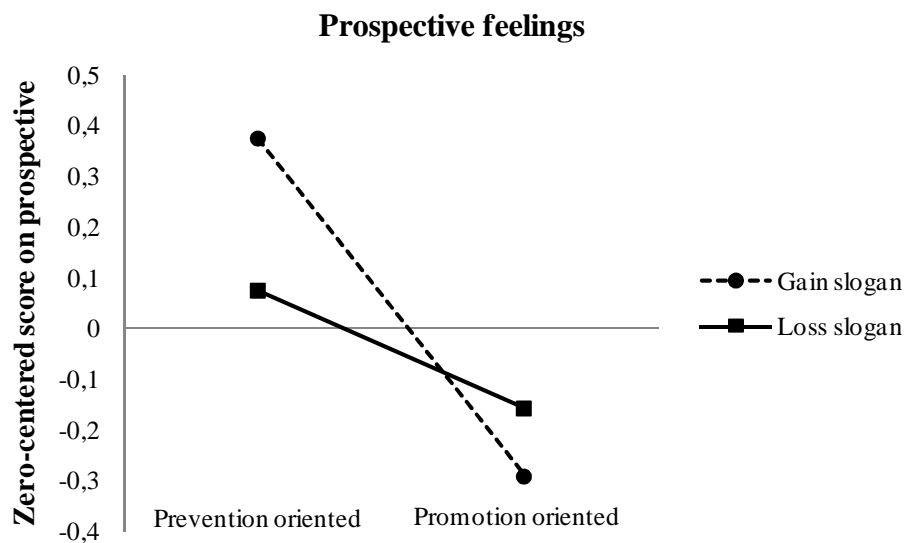
Only for prospective feelings about active work commuting, the regression model was significant ($R^2_{\text{adjusted}} = .03$, $F(3,333) = 4.48$, $p < .01$). The results showed a significant two-way interaction between message framing and regulatory focus ($\beta = -.153$, $t = -2.125$, $p < .05$). In order to explore the interaction, the slopes of regulatory focus were examined. As Figure 3 shows were the slopes for both the gain-framed message and the loss-framed message decreasing, which means that prevention-oriented people had as well in the gain-framed condition as well as in the loss-framed condition more positive feelings about active work commuting by EAB, compared to promotion oriented people. However, in contrast with the hypothesis, the regression coefficients indicated a non-fit effect for the regulatory focus x framing method interaction, which implies that for prevention oriented people, a gain-framed slogan was the most effective and for promotion oriented people, a loss-framed slogan was the most effective (Figure 3). Indeed, for prevention oriented people, a spotlight analysis at one standard deviation below the mean of regulatory focus showed a significant difference such that they had significantly more positive feelings about active work commuting by EAB

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

when exposed to the gain-framed slogan ($\beta = .150$, $t = 2.106$, $p < .05$). A similar spotlight analysis at one standard deviation above the mean of regulatory focus showed no significant difference ($\beta = -.067$, $t = -.932$, $p > .10$), which means that for promotion oriented people, it made no significant difference whether the slogan was framed in terms of gains or losses.

Figure 3

Zero-Centered Scores on Prospective Feelings, Regardless of Risk Reduction Condition



Risk reduction conditions. Subsequently to the overall analysis, separate regression analysis were conducted to each of the four risk reduction conditions (i.e., physical-, financial-, psychological- and time risk reduction) to see if different interaction effects appear by exposure to different risk reduction conditions. The results showed that the expected interaction effect was only found in the financial condition. Specifically, the regression models were significant for prospective feelings ($R^2_{\text{adjusted}} = .14$, $F(3,82) = 5.64$, $p < .01$) and marginally significant for attitude towards EABs ($R^2_{\text{adjusted}} = .05$, $F(3,82) = 2.58$, $p < .10$).

Regarding prospective feelings, the interaction effect was found to be statistically significant ($\beta = -.482$, $t = -3.591$, $p < .01$). The slope of the gain-framed message was found

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

to be negative, while the slope of the loss-framed message was positive. The spotlight analysis showed a significant difference at one standard deviation below the mean of regulatory focus ($\beta = .352$, $t = 2.558$, $p < .05$), which means that prevention oriented people had more positive feelings about active work commuting by EAB when exposed to the gain-framed message, compared to the loss-framed message. Conversely, the spotlight analysis at one standard deviation above the mean showed also a significant difference such that promotion oriented people had more positive feelings about active work commuting by EAB when exposed to the loss-framed message ($\beta = -.334$, $t = -2.624$, $p < .05$). In this way, the regression coefficients indicated again the opposite direction (i.e., non-fit results in higher scores). This means that feelings about active work commuting by EAB became more positive when people were exposed to a slogan that was incongruent with their predominantly regulatory focus.

Also regarding attitude towards EABs, there was a significant interaction effect found ($\beta = -.291$, $t = -2.536$, $p < .05$). Similar to the effect on prospective feelings, the slope was negative when exposed to the gain-framed message and positive when exposed to the loss-framed message. However, the spotlight analysis showed not significant effects on both sides of regulatory focus. For predominantly prevention oriented people, the attitude towards EABs was significantly more positive when exposed to the gain-framed slogan ($\beta = .250$, $t = 2.125$, $p < .05$). For predominantly promotion oriented people, the attitude towards EABs did not significantly become more positive, but however, became more positive when exposed to the loss-framed slogan ($\beta = -.164$, $t = -1.507$, $p > .10$).

Hypotheses 1a+b and H2 a+b aimed to find evidence for regulatory fit theory. Since the findings only show interaction effects in the financial risk reduction condition, specifically for prospective feelings and attitude towards EABs, these hypotheses are not confirmed. Moreover, the interaction effects that did appear showed even a contrasting

relationship as predicted (i.e., non-fit effect). For that reason, both hypothesis 1 and 2 cannot be accepted.

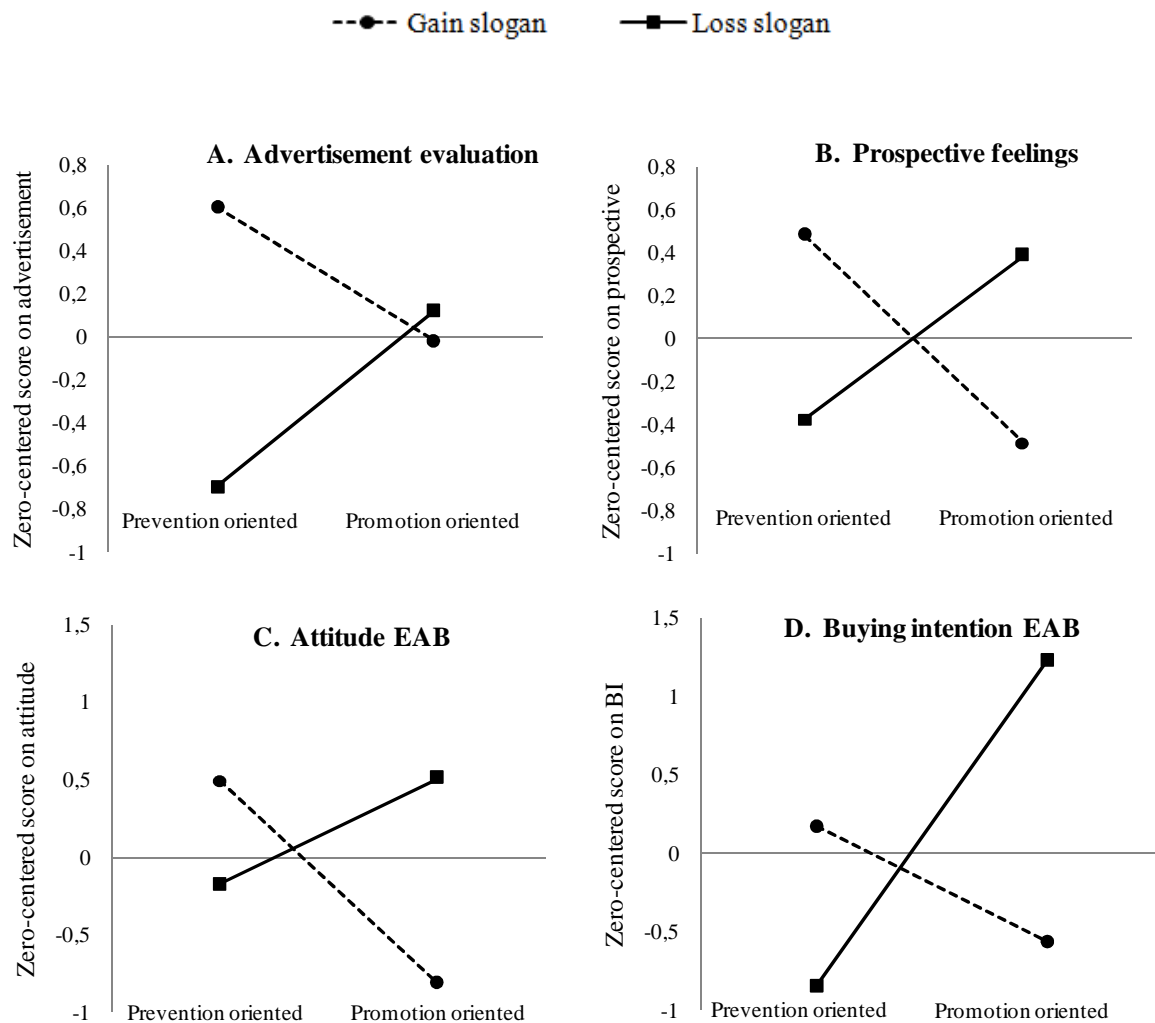
Moderation analyses. In order to examine whether the regulatory (non)fit effects in the financial risk reduction condition are moderated by level of physical activity, separate regression analyses were conducted for people with moderate or high levels of physical activity (people with low level of physical activity were excluded since there were not enough participants in this condition for reliable results). The regression analyses indeed showed differences between moderate and highly physical active people. The interaction effects were mostly found in the conditions with moderate physical active people, which implies that type of message framing was more of interest and had most influence on moderately active people.

Among moderately physical active people was first of all an interaction effect found in the financial risk reduction condition for advertisement evaluation ($\beta = -.508$, $t = -2.604$, $p < .05$). As graph A in Figure 4 also shows is the slope negative when exposed to the gain-framed slogan and positive when exposed to the loss-framed slogan. However, the influence of framing method was not equal to prevention- and promotion oriented people. A spotlight analysis at one standard deviation below the mean of regulatory focus was significant ($\beta = .651$, $t = 3.565$, $p < .01$), such that prevention oriented people evaluated the advertisement as more believable, informative and interesting when exposed to the gain-framed slogan versus the loss-framed slogan. The spotlight analysis at one standard deviation above the mean of regulatory focus showed no significant difference ($\beta = -.072$, $t = -.411$, $p > .10$). It means that for promotion oriented people, the advertisement evaluation was slightly (but not significantly) more positive in the loss-framed condition.

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

Figure 4

Zero-Centered Scores on Advertisement Evaluation, Prospective Feelings, Attitude towards EABs and Buying Intention for Moderately Active People who were Exposed to the Message in the Financial risk reduction



Regarding prospective feelings (graph B in Figure 4) a clear non-fit interaction effect was found ($\beta = -.605$, $t = -2.466$, $p < .05$) for moderately active people in the financial risk reduction condition. Similar to prior findings in the current study, the slope for regulatory focus was negative in the gain-framed condition and positive in the loss-framed condition, which indicates a non-fit effect. The spotlight analysis between the scores of the gain- and loss-framed slogans showed only marginal significant effects, as well for prevention oriented

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

people ($\beta = .427, t = 1.861, p < .10$) as for promotion oriented people ($\beta = -.434, t = -1.963, p < .10$). This means that for both prevention oriented people and promotion oriented people, an incongruent slogan resulted in more positive feelings about active work commuting by EAB.

Accordingly, also for attitude towards EABs a significant interaction effect was found among moderately physical active people ($\beta = -.701, t = -3.553, p < .01$). Similar to all other interaction effects, the regression coefficients indicate a non-fit effect (graph C in Figure 4), such that for prevention oriented people the gain-framed slogan resulted in a more positive attitude towards EABs and for promotion oriented people, a loss-framed slogan resulted in a better attitude towards EABs. The spotlight analysis at one standard deviation below the mean of regulatory focus showed that this difference between the gain- and loss-framed slogan was marginally significant ($\beta = .335, t = 1.813, p < .10$). A similar spotlight analysis at one standard deviation above the mean of regulatory focus showed that for promotion oriented people, the loss-framed slogans had significantly higher influence on the attitude towards EABS compared to the gain-framed slogans ($\beta = -.663, t = -3.728, p < .01$).

Finally, also for moderately physical active people in the financial risk reduction condition was a significant interaction effect found on buying intention of an EAB ($\beta = -.991, t = -2.351, p < .05$). The slope for regulatory focus was positive in the gain-framed condition and negative in the loss-framed condition (see graph D in Figure 4). However, for prevention oriented people, the buying intention was not significantly higher in the gain-framed condition, compared to the loss-framed condition ($\beta = .510, t = 1.292, p > .10$). For promotion oriented people, the loss-framed slogan resulted in significantly higher buying intentions, compared to the gain-framed condition ($\beta = -.901, t = -2.370, p < .05$).

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

In conclusion, the current findings show that regulatory fit is probably not always or not solely the moderator of message framing effects. Apparently, within the domain of active work commuting by EAB, regulatory fit effects only appear in the financial risk reduction condition. However, the intended interaction effects are not in line with the expectations as stated in hypotheses 1 and 2. The implications of these findings are discussed in the next section. Some support is found with respect to the third hypothesis concerning differences between the level in physical activity: interaction effects are mediated by participants' level of physical activity. Note that this hypothesis was only supported for the financial risk reduction condition. The implications of the findings in the current study are discussed in the next section.

Discussion

The main objective of the current study was to examine the effect of tailored messages to individual differences in regulatory focus in order to persuade people to change their commuting behavior. In contrast to existing literature, the results did not show in each condition the intended effects. More specifically, only for prospective feelings (i.e., imagining feeling good about engaging in active work commuting) an interaction effect was found. These findings diverge from most literature on regulatory focus theory. However, Friedman-Wheeler, Rizzo-Busack, McIntosh, Ahrens and Haaga (2010) neither found support for the congruency hypothesis of regulatory fit. They argue that context of research (i.e., smoking) or methodological limitations may explain these findings.

Also in the current study, the results may differ because of the unique focus on commuting behavior. Perhaps regulatory fit theory does not apply to the context of active work commuting. This conclusion seems rather unlikely since Latimer et al. (2008) did find support for the congruency hypothesis in the context of physical activity, which is closely related to active work commuting. With respect to method, Friedman-Wheeler et al. (2010) developed the smoking vignettes themselves and state that this manipulation may not have been effective. Although the slogans in the current study were conducted in collaboration with communication professionals of Gazelle, not all of them were pre-tested (i.e., only physical risk reduction condition). Future research should incorporate a pretest of all conditions in order to make sure that the intended manipulation did work. Nevertheless, the framing manipulation (i.e., gain- or loss-framed) did work, as the results of the manipulation check shows. A more suitable explanation for the divergent results is that there may be other moderating factors that influence message framing effects and moderate regulatory fit on persuasion. For example private self-focus, involvement and motivation to process information, which will be discussed later on in more detail.

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

Regarding the current findings, for prospective feelings a significant interaction effect was found. However, the regression coefficients indicated a non-fit effect. This means that slogans that were formulated incongruent with participants' chronic regulatory focus resulted in more positive prospective feelings about active work commuting by EAB. A more in-depth analysis between the four risk reduction analyses shows that the interaction effects only appeared in the financial risk reduction condition. This implies that for as well promotion-focused participants as prevention-focused participants in the physical-, psychological- and time- risk reduction conditions, it made no difference whether the slogan was framed congruent or incongruent to their chronic regulatory focus. In the financial risk reduction condition however, it did matter (for as well promotion- as prevention oriented participants) whether the slogan was framed in terms of gains or losses.

The effect was particularly found among moderately active people, which implies that participants with a high level of physical activity are less affected by different types of message framing. This may be explained by the fact that those people are already very active and, consequently, are less sensitive for messages that encourage them to be even more physically active. The interaction for moderately active people was again a non-fit effect, which means that participants in this condition had higher scores on advertisement evaluation, prospective feelings, attitude towards EABs and buying intention of an EAB when the message was framed by a slogan that did *not* fit their chronic regulatory focus.

Although these non-fit interaction effects only seem to distract with existing evidence related to regulatory fit theory, are there some similar effects found in literature. For example, Cesario et al. (2004) also found a non-fit effect in one of their conditions. Their results showed that the interaction effect on confidence ratings was reversed when the misattribution or transfer of feeling right from regulatory fit was blocked. According to Fransen, Fennis, Pruyn and Vohs (2011) and Harding, Lisjak and Lee (2012) are there moderating factors for

regulatory fit effects. Fransen et al. (2011) investigated the moderating role of private self-focus in such regulatory fit effects. They found that for people with high private self-focus, the regulatory fit effect was stronger than for people with low private self-focus.

Harding et al. (2012) went beyond this principle of differences in strength of fit effect and showed that non-fit effects can appear by moderating role of involvement and motivation to process information. They hypothesized that those people, who were under high-involvement conditions and who were exposed to strong and compelling message arguments, were more persuaded by appeals that did not fit their regulatory focus. The underlying suggestion is that people's motivation to process information moderates the fit effect on persuasion. An important article that Harding et al. (2012) refer to as a basis for their hypothesis is the study of Wang and Lee (2006). That study showed that the regulatory fit effect on persuasion disappeared when people were motivated to process information. The reason why Wang and Lee (2006) probably did not find a non-fit effect is, according to Harding et al. (2012), that their participants were exposed to as well fit- as non-fit information. Other relevant evidence was found in the study of Förster, Higgins and Werth (2004). Their findings show that participants had a better memory for inconsistent information, compared to consistent or neutral information.

Based on three different experiments, Harding et al. (2012) found support for their hypothesis. As expected, the findings showed that non-fit effects appear when people are motivated to process information. Moreover, these non-fit appeals were more persuasive under high-involvement conditions (Harding et al., 2012). These findings illustrate a possible explanation for the non-fit effects in the current study. The sample consisted of Gazelle stakeholders, which are probably people who are motivated to process information of Gazelle and are also more involved than non-stakeholders of Gazelle.

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

The findings of the current study are of interest for the area of consumer psychology because they provide support for a recently examined, new view on regulatory focus theory. Where findings in literature commonly predict enhancement of persuasion in regulatory fit conditions, shows the current study that this will not always necessarily be the case. Framing effects are apparently not always only moderated by regulatory focus, but also by other factors such as private self-focus, involvement and motivation to process information. This conclusion may have influence on prior evidence with regard to regulatory fit, because these findings may be biased by participant sample. For example when participants were low involved with the topic of the concerned study or when a sample of students was less motivated to process information because their only objective was to earn credits. Future research is necessary to further pursue this line of thought and to gain more knowledge of regulatory non-fit effects on persuasion. Therefore, it is important to focus on possible moderating factors which cause these effects. Moreover, the study of Harding et al. (2012) could be extended to other areas and other type of message exposures to generalize their findings.

Practical implications. Also on a practical level, these findings offer implications for the effectiveness of (health) communication in advertisements. In general, the current study shows that having knowledge about the target group is important, not only from the point of view of chronic regulatory focus, but also for degree of involvement and motivation to process information. These personal details seem to determine the response on advertisement slogans and therefore need to be understood first in order to formulate slogans in the most persuasive way. Moreover, personal characteristics may determine the target group for a certain campaign. As an example, the current study shows that the higher the level of physical activity, the stronger the motivation is to participate in active work commuting and

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

the more positive prospective feelings they have about commuting by EAB. Therefore, gathering information about who is physically active is knowing who to target on. This information may be collected among current and potential customers by a questionnaire such as the IPAQ.

In the current study were also some main effects found that have direct implications for marketing and communication management, specifically for Gazelle. First of all shows the data that gain-framed slogans were more persuasive with respect to advertisement evaluation. Therefore, it is recommended to formulate slogans in advertisements in terms of gains when the objective is to create a more believable, informative and interesting advertisement. However, gain-framing did not result in significantly higher motivation to participate in active work commuting by EAB, a better attitude of active work commuting and EABs or a higher buying intention of an EAB. This implicates that other strategies are necessary in order to reach these goals.

Another relevant but also somewhat obvious finding is the gender effect on attitude towards EABs. Women appear to have a better attitude towards EABs than men, especially when exposed to the message in the psychological condition. Sales data show that most of the EABs are currently sold to women (67%, GfK, 2011), which indicates that most women already have accepted the EAB, in contrast to men. Therefore, the most potential target group that should be focused on in future advertisements are men. Furthermore, the results showed that, compared to the physical-, time- and financial risk reduction condition, the psychological risk reduction condition was overall the most persuasive condition. This is an important and notable finding, because it results not only in the recommendation for Gazelle to use slogans that focus on psychological feelings and benefits. It goes beyond and contributes to the effectiveness and persuasiveness of health communication by suggesting that it is not necessary, and perhaps even less effective, to focus on physical health aspects

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

when the objective of an advertisement is to enhance public health. Many studies that aim to enhance public health by help of message framing communicate about physical health benefits or disadvantages as a result of (not) performing a certain behavior. The current findings indicate that the effectiveness of health communication may be enhanced by changing the underlying context of advertisements into, for example, a psychological context. In this way the goal remains to enhance health, but shifts the context in which should to be advertised. Further research is necessary in order to confirm these suggestions and to generalize the findings of the current study.

Limitations and further research. Some limitations of the current study are notable and need to be taken into account in future research. First of all, there are some limitations with regard to the characteristics of the participant sample. The sample appeared to be particularly moderately or highly physically active before the start of the study. This implies that most of the participants already seemed to meet the HEPA recommendations, while many health advertisements primarily targeted at those who do not, or not sufficiently, engage in healthy behavior. Future research should include the IPAQ questionnaire as selection criteria in order to make sure that the persuasiveness of tailored messages are examined at those who are insufficiently physically active. Another interesting point regarding the characteristics of the participant sample is the fact that all participants were Gazelle stakeholders. As described earlier were these participants probably high(er) involved and more motivated to process information. This may have influenced the regulatory fit effect. Finally, people who already commute by either a regular or electric bicycle were excluded from the survey. However, it is important to include these people in the future also in the sample, because they may confirm or disconfirm the persuasiveness of the slogans and the advertisement in general. They may indicate whether the advertisement can be evaluated

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

as reliable and trustworthy. Moreover, a lot can be learned from differences in existing and potential customers.

Secondly, there was a notable amount of non-response towards the invitation. It would be interesting to follow-up on these respondents to ask them what their reasons were to not participate in the survey. With that knowledge is it probably in the future possible to select a better sample and to write a more persuasive invitation.

Furthermore, the framing manipulation was not consequent with respect to the use of the word EAB. More specifically, two out of eight advertisements did not incorporate the word EAB in the slogan, while the others did. Although more in-depth research did not provide insight whether this had influenced the outcomes, is there still a serious possibility that it affected the results. For that reason, future research should aim to be consistent in use of words with respect to message framing manipulation.

Finally, it would be interesting to study the effects of different risk-reduction conditions not only separately, but combined with each other. For example, a slogan with both physical- and psychological risk reduction elements might be more persuasive than a message that focuses on only one risk reduction dimension.

In conclusion, it can be stated that based on the current findings further research is necessary in multiple ways. The importance of future research in exploring motivations in active work commuting behavior is essential, considering the health- and environmental consequences of commuting by motorized transportation modes. Future research should aim to extend the knowledge of regulatory non-fit effects and the underlying factors that moderate these effects on persuasion. This can be realized by for example generalizing and extending the current study. The use of a different participant sample, improved framing manipulation, induced regulatory focus (i.e., compared to measuring chronic regulatory focus), involvement

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

and motivation to process information as moderating factors are examples of relevant adjustments.

Acknowledgements

This master thesis would not have been possible without the guidance, support and help of several individuals who in one way or another contributed in the preparation and completion of this study. First of all, I would like to thank my supervisors of the University of Twente, prof.dr. Ad Pruyn, dr. Oscar Peters and dr. Jenny Bittner for their professional help, suggestions, ideas, valuable feedback and support regarding my master thesis.

Furthermore, I would like to thank Royal Dutch Gazelle, who supported this research, provided professional research facilities and contributed practical relevance to this study. In particular, I would like to thank Karel van Wesemael for sharing his expertise, guiding me through the research process and his valuable comments throughout the study.

Moreover, I would like to thank fellow students, for their advice, humor, references and suggestions regarding my master thesis, but also regarding the past two years I've been studying Communication Science. Special thanks to Erik van Nistelrooij, for his advice on the statistical analysis and Sandra te Stroet, who was always willing to help and give her best suggestions.

Last but definitely not least, I would like to thank my family and friends for their support and understanding, especially during the obstacles in the completion of this research work. Finally, I would like to thank Ruben Brandwagt for his patience and steadfast encouragement to complete this study. He was always there cheering me up and stood by me through the good times and the bad.

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Appendix A: Original questionnaire (in Dutch)

1. Demografische gegevens

- Geslacht
- Leeftijd
- Postcode
- Huishouden
- Hoogst genoten opleiding
- Dagelijkse bezigheid
- Momenteel een baan of ander (onbetaald) werk op een andere locatie dan thuislocatie?
 - Indien ja: afstand tot bestemming
 - Indien nee: uitsluiting van deelname aan het onderzoek
- Hoofd vervoersmiddel
 - Indien reguliere of elektrische fiets: deelname aan ander onderzoek voor Gazelle; uitsluiting voor dit onderzoek.
- In het bezit van een fiets?
 - Indien ja, wat voor type fiets (reguliere [stads-] fiets, hybride fiets, elektrische fiets, sportfiets)

2. *Regulatory focus vragenlijst*

De volgende vragen hebben betrekking op specifieke gebeurtenissen in uw leven. Wilt u voor iedere vraag aangeven in welke mate dit betrekking heeft op u?

1. Bent u, vergeleken met de meeste andere mensen, typisch niet in staat om uit het leven te halen wat u zou willen? (pro*)
2. Hebt u, toen u opgroeide, 'ooit grenzen overschreden' door dingen te doen die uw ouders niet tolereerden? (prev*)
3. Hoe vaak hebt u dingen bereikt die u ertoe aangezet hebben om nog harder te werken? (pro)
4. Werkte u uw ouders vaak op de zenuwen toen u opgroeide? (prev*)
5. Hoe vaak hield u zich aan de regels en voorschriften die door uw ouders waren vastgesteld? (prev)
6. Toen u opgroeide, heeft u zich toen ooit gedragen op een manier die uw ouders verwerpelijk vonden? (prev*)
7. Doet u het vaak goed met verschillende dingen die u probeert? (pro)
8. Ik ben wel eens in moeilijkheden geraakt door niet voorzichtig genoeg te zijn. (prev*)
9. Wat betreft het bereiken van dingen die belangrijk voor me zijn, vind ik dat ik niet zo goed presteer als ik idealiter zou willen. (pro*)
10. Ik heb het gevoel dat ik vooruitgang heb geboekt in het succesvol zijn in mijn leven (pro)
11. Ik heb heel weinig dingen gevonden in mijn leven die mij echt boeien en waar ik veel energie in wil stoppen. (pro*)

Schaal:

1	2	3	4	5	
<i>Nooit of zelden</i>		<i>Soms</i>		<i>Erg</i>	<i>vaak</i>

Pro= promotion vraag

Prev= prevention vraag

* = omgeschaald

3. IPAQ vragenlijst

De volgende vragen gaan over de fysieke activiteit die u in de **afgelopen zeven dagen** gedaan hebt. Er zitten vragen bij over de lichaamsbeweging op uw werk, over uw verplaatsingen, over uw werk in huis en in de tuin, en over uw vrije tijd in verband met ontspanning, lichaamsbeweging en sport. Probeer op alle vragen te antwoorden, zelfs als u vindt dat u niet erg actief bent.

Denk aan alle **zware** activiteiten die u de **afgelopen 7 dagen** hebt gedaan. Zware fysieke activiteiten verwijzen naar activiteiten die een zware lichamelijke inspanning vereisen en waarbij u veel sneller en dieper ademt dan normaal. Het gaat hierbij alleen om de fysieke activiteiten die u gedurende **minstens 10 minuten aan één stuk** gedaan heeft.

1. Hoe vaak, in de **afgelopen 7 dagen**, heeft u **zware** fysieke activiteiten gedaan zoals zwaar tilwerk, spitten, aerobic, of snel fietsen?

_____ **dagen per week**

☐

Geen zware fysieke activiteiten → ***Door naar vraag 3(automatisch)***

2. Hoeveel tijd besteed u gemiddeld in totaal op zo'n dag besteedt aan **zware** fysieke activiteiten?

_____ uur _____ minuten/dag

☐

Geen idee

Denk nu aan alle **matig zware** activiteiten van de **afgelopen 7 dagen**. **Matige fysieke activiteiten** verwijzen naar activiteiten die een matige lichamelijke inspanning vereisen en waarbij u iets sneller en dieper ademt dan normaal. Het gaat hierbij alleen om de fysieke activiteiten die u gedurende **minstens 10 minuten aan één stuk** gedaan heeft.

3. Hoe vaak, in de **afgelopen 7 dagen**, heeft u **matige** fysieke activiteiten gedaan zoals het dragen van lichte lasten of het fietsen op normale snelheid? Wandelen valt hier niet onder.

_____ **dagen per week**

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY
ELECTRICALLY ASSISTED BICYCLE

☐

Geen matige fysieke activiteiten → *Door naar vraag 5*

4. Hoeveel tijd besteed u gemiddeld op zo'n dag aan **matige** fysieke activiteiten?

_____ uur _____ minuten/dag

☐

Geen idee

Denk nu aan de tijd die u gewandeld heeft in de **afgelopen 7 dagen**. Hieronder valt wandelen op het werk en thuis, wandelen om te reizen van plaats naar plaats en al het ander lopen of wandelen dat u heeft gedaan ter recreatie, sport of vrije tijd.

5. Op hoeveel dagen, in de **laatste 7 dagen**, heeft u **gewandeld** gedurende minstens **10 minuten aan één stuk**?

_____ dagen per week

☐

Geen één dag → *Door naar vraag 7*

6. Hoeveel tijd heeft u (gemiddeld) in totaal heeft u op zo'n dag **gewandeld**?

_____ uur _____ minuten/dag

☐

Geen idee

De laatste vraag heeft betrekking op de tijd die u de afgelopen 7 dagen **zittend** doorbracht op het werk, thuis, tijdens studiewerk of in uw vrije tijd. Hieronder valt ook de tijd die u achter een bureau zat, bezoek kreeg, zat te lezen, of naar televisie zat of lag te kijken. De tijd die u zitten doorbracht in een motorvoertuig, valt hier niet onder.

7. Hoeveel tijd heeft u gemiddeld **gezet** op een doordeweekse dag, in de afgelopen 7 dagen?

_____ uur _____ minuten/ per dag

☐

Geen idee

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

4. Blootstelling aan de advertentie

Deelnemers werden random toegewezen aan één van de acht condities.

Op de volgende pagina krijgt u een afbeelding met tekst te zien. Bekijk deze advertentie alsof u deze advertentie op een website of in een magazine ziet.

Physical risk reduction		Financial risk reduction	
Gain	Loss	Gain	Loss
			
Time risk reduction		Psychological risk reduction	
Gain	Loss	Gain	Loss
			

5. Manipulatie check (gain/loss framing)

De volgende vragen hebben betrekking op de advertentie die u zojuist heeft gezien. Geef aan wat volgens u het meest passend is bij de slogan die u heeft gelezen op de vorige pagina.

Noot: Er is geen goed of fout antwoord; het gaat om uw mening.

- Framing manipulatie check
 - Ik denk dat de slogan de voordelen van de elektrische fiets als woon-werk vervoersmiddel benadrukte
 - Ik denk dat de slogan de nadelen van niet reizen met de elektrische fiets tussen woning en werk benadrukte.

1

2

3

4

5

Absoluut niet mee eens

Helemaal mee eens

6. Value derived from fit variabelen

Kunt u per stelling aangeven welk antwoord voor u van toepassing is?

- Ik vond de advertentie...
 - Geloofwaardig
 - Informatief
 - Interessant

1	2	3	4	5
<i>Absoluut niet... (geloofwaardig, etc)</i>			<i>Heel erg.. (geloofwaardig, etc)</i>	

- Ik ga proberen (ik heb de intentie) om minimaal 3 keer in de week voor woon-werk verplaatsingen de (elektrische) fiets te pakken

1	2	3	4	5
<i>Helemaal niet mee eens</i>			<i>Helemaal mee eens</i>	

- Ik verwacht dat reizen tussen woning en werk met de elektrische fiets ... is.

1	2	3	4	5
<i>Onaangenaam</i>			<i>Aangenaam</i>	

1	2	3	4	5
<i>Niet leuk</i>			<i>Leuk</i>	

1	2	3	4	5
<i>Stressvol</i>			<i>Relaxed</i>	

1	2	3	4	5
<i>Extreem waardeloos</i>			<i>Extreem waardevol</i>	

7. *Nieuwheid elektrische fiets*

Een elektrische fiets is een fiets met elektrische trapondersteuning. Er is alleen ondersteuning van de motor wanneer u zelf ook trapt; het is dus geen vervanging van de eigen trapkracht zoals bij een scooter. Deze fiets heet ook wel een e-bike en kan bijvoorbeeld gebruikt worden voor het fietsen tussen woning en werk.

Kunt u op basis van de omschrijving van een e-bike aangeven hoe nieuw u de elektrische fiets vindt?

1	2	3	4	5
<i>Absoluut niet nieuw</i>			<i>Heel erg nieuw</i>	

8. *Attitude ten opzicht van de elektrische fiets*

- Geef aan in welke mate u een elektrische fiets als vervoersmiddel aantrekkelijk, interessant en veilig vindt:

1	2	3	4	5
<i>Absoluut niet aantrekkelijk</i>			<i>Heel erg aantrekkelijk</i>	

1	2	3	4	5
<i>Absoluut niet interessant</i>			<i>Heel erg interessant</i>	

1	2	3	4	5
<i>Absoluut niet veilig</i>			<i>Heel erg veilig</i>	

- Hoe beoordeelt u de verwachte kwaliteit van de elektrische fiets als vervoersmiddel?

1	2	3	4	5
<i>Heel erg slecht</i>			<i>Heel erg goed</i>	

- Hoe tevreden verwacht u te zijn als u de elektrische fiets zou gebruiken?

1	2	3	4	5
<i>Absoluut niet tevreden</i>			<i>Heel erg tevreden</i>	

9. Aankoopintentie elektrische fiets

Hoe waarschijnlijk schat u de kans dat u, of iemand binnen uw huishouden, in de komende 12 [24] maanden een elektrische fiets aanschaft?

1	2	3	4	5	6	7
<i>Zeer onwaarschijnlijk/ zeker niet</i>					<i>Zeer waarschijnlijk/ zeker</i>	

Appendix B: Translated questionnaire (in English)

1. Demographic characteristics

- Gender
- Age
- Postal code
- Household structure
- Level of education
- Occupation
- Currently commuting?
 - o If yes: distance to destination
 - o If no: exclusion for this study
- Mode of transport
 - o If bicycle or EAB: exclusion for this study
- Possession of a bicycle?
 - o If yes: What type of bicycle? (regular, hybrid, electric, MTB, ATB, race, other....)

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY
ELECTRICALLY ASSISTED BICYCLE

2. *Regulatory Focus Questionnaire*

This set of questions asks you about specific events in your life. Please indicate your answer to each question by circling the appropriate number below it.

1. Compared to most people, are you typically unable to get what you want out of life? (pro*)
2. Growing up, would you ever “cross the line” by doing things that your parents would not tolerate? (prev*)
3. How often have you accomplished things that got you “psyched” to work even harder? (pro)
4. Did you get on your parents’ nerves often when you were growing up? (prev*)
5. How often did you obey rules and regulations that were established by your parents? (prev)
6. Growing up, did you ever act in ways that your parents thought were objectionable? (prev*)
7. Do you often do well at different things that you try? (pro)
8. Not being careful enough has gotten me into trouble at times. (prev*)
9. When it comes to achieving things that are important to me, I find that I don’t perform as well as I ideally would like to. (pro*)
10. I feel like I have made progress toward being successful in my life. (pro)
11. I have found very few hobbies or activities in my life that capture my interest or motivate me to put effort into them. (pro*)

Scale:

1	2	3	4	5
<i>never or seldom</i>		<i>sometimes</i>		<i>very often</i>

Pro= promotion question

Prev= prevention question

* = reversed question

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY
ELECTRICALLY ASSISTED BICYCLE

3. Short IPAQ questionnaire

The next questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the **last 7 days**. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for **at least 10 minutes at a time**.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

_____ **days per week**

☐

No vigorous physical activities

➔ ***Skip to question 3 (automatically)***

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐

Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY
ELECTRICALLY ASSISTED BICYCLE

than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____ **days per week**

☐

No moderate physical activities ➡ *Skip to question 5*

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐

Don't know/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

_____ **days per week**

☐

No walking ➡ *Skip to question 7*

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY
ELECTRICALLY ASSISTED BICYCLE

8. How much time did you usually spend **walking** on one of those days?

_____ **hours per day**

_____ **minutes per day**

☐

Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

9. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

_____ **hours per day**

_____ **minutes per day**

☐

Don't know/Not sure

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY ELECTRICALLY ASSISTED BICYCLE

4. Exposure to the ad

Participants were randomly assigned to one of the eight conditions.

On the next page you'll see an advertorial which consists of an image and a slogan. View this advertorial as you are viewing it on a website or in a magazine.

Physical risk reduction		Financial risk reduction	
Gain	Loss	Gain	Loss
Time risk reduction		Psychological risk reduction	
Gain	Loss	Gain	Loss

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY
ELECTRICALLY ASSISTED BICYCLE

5. *Manipulation check (gain/loss framing)*

The following questions refer to the advertorial you just have seen. Please indicate to what extent you agree with the following statements.

Note: There is no right or wrong answer; it concerns your opinion.

- Perceived framing of the message:
 - I think the message emphasized the benefits of participating in active work commuting by electrically assisted bicycle
 - I think the message emphasized the risks of not participating in active work commuting by electrically assisted bicycle

1

2

3

4

5

Totally disagree

Totally agree

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY
ELECTRICALLY ASSISTED BICYCLE

6. 'Value derived from fit' variables: thoughts & feelings towards active work commuting

- To what extent you found the advertisement:

- Believable
- Informative
- Interesting

1	2	3	4	5
<i>Not at all...(believable, etc)</i>			<i>Extremely....(believable, etc)</i>	

- I will try (I intend) to participate in active work commuting (i.e., electric cycling to work) for at least three times per week.

1	2	3	4	5
<i>Strongly disagree</i>			<i>Strongly agree</i>	

- I think, engaging in active work commuting by electric bicycle is:

1	2	3	4	5
<i>Unpleasant</i>			<i>Pleasant</i>	

1	2	3	4	5
<i>Not enjoyable</i>			<i>Enjoyable</i>	

1	2	3	4	5
<i>Stressful</i>			<i>Relaxing</i>	

1	2	3	4	5
<i>Worthless</i>			<i>Valueable</i>	

7. *Novelty EAB*

<Description EAB>

Based on the description of the *electric bicycle*, please rate how new you think it is:

1	2	3	4	5
Not at all new			Extremely new	

8. *Attitude towards the product*

- To what extent you think an electric bicycle is attractive, interesting and safe?

1	2	3	4	5
Not attractive at all			Extremely attractive	

1	2	3	4	5
Not interesting at all			Extremely interesting	

1	2	3	4	5
Not safe at all			Extremely safe	

- How do you rate the expected quality of the product?

1	2	3	4	5
Very poor			Very good	

- How satisfied do you think you would be with this product/ an electric bicycle in everyday life?

1	2	3	4	5
Not satisfied at all			Very satisfied	

THE ROLE OF MESSAGE FRAMING IN PROMOTING ACTIVE WORK COMMUTING BY
ELECTRICALLY ASSISTED BICYCLE

9. *Buying probability of an EAB*

During the next 12 [24] months, what do you think the chances are that you or someone in the household will buy an electrically assisted bicycle?

1	2	3	4	5	6	7
<i>No chance/ almost no chance</i>					<i>Certain/ practically certain</i>	

Appendix C. Manipulated interventions (in Dutch)



Gain-Framed slogan



Loss-Framed slogan

Financial risk reduction condition



KONINKLIJKE
Gazelle

Gebruik nu de elektrische fiets als vervoersmiddel naar je werk!

Woon-werk verkeer per elektrische fiets verhoogt je lichamelijke conditie en daarmee je gezondheid!

Gain-Framed slogan



KONINKLIJKE
Gazelle

Gebruik nu de elektrische fiets als vervoersmiddel naar je werk!

Woon-werk verkeer per auto of openbaar vervoer verlaagt je lichamelijke conditie en daarmee je gezondheid!

Loss-Framed slogan

Physical risk reduction condition



Gain-Framed slogan



Loss-Framed slogan

Psychological risk reduction condition



Gain-Framed slogan



Loss-Framed slogan

Time risk reduction condition

