

UNIVERSIDADE FEDERAL DO PARANÁ

ANGELA NEGRÃO TORRES GOMES

WHEN HOPE HELPS MORE:  
THE INCIDENTAL EFFECT OF HOPE AND PRIDE ON COMPLIANCE WITH  
HEALTH-CARE WARNING MESSAGES

CURITIBA

2019

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HEALTH-CARE WARNING MESSAGES

Tese apresentada ao Programa de Pós-Graduação em Administração, área de Concentração em Estratégia de Marketing e Comportamento do Consumidor, do Setor de Ciências Sociais Aplicadas da Universidade Federal do Paraná, como parte das exigências para obtenção do título de Doutor.

Orientadora: Prof.<sup>a</sup> Dr.<sup>a</sup> Danielle Mantovani Lucena da Silva

CURITIBA

2019

FICHA CATALOGRÁFICA ELABORADA PELA BIBLIOTECA DE CIÊNCIAS SOCIAIS  
APLICADAS – SIBI/UFPR COM DADOS FORNECIDOS PELO(A) AUTOR(A)  
Bibliotecária: Mara Sueli Wellner – CRB 9/922

Gomes, Angela Negrão Torres

When hope helps more: the incidental effect of hope and pride on compliance with health-care warning messages / Angela Negrão Torres Gomes. - 2019.

86 p.

Orientadora: Danielle Mantovani Lucena da Silva.

Tese (Doutorado) - Universidade Federal do Paraná. Programa de Pós-Graduação em Administração, do Setor de Ciências Sociais Aplicadas.

Defesa: Curitiba, 2019.

1. Comportamento do consumidor. 2. Consumidores – Percepção de risco. 3. Emoções positivas. I. Silva, Danielle Mantovani Lucena da, 1982- II. Universidade Federal do Paraná. Setor de Ciências Sociais Aplicadas. Programa de Pós-Graduação em Administração. III. Título.

CDD 658.8343




MINISTÉRIO DA EDUCAÇÃO  
SETOR SETOR DE CIÊNCIAS SOCIAIS E APLICADAS  
UNIVERSIDADE FEDERAL DO PARANÁ  
PRÓ-REITORIA DE PESQUISA E PÓS-GRADUAÇÃO  
PROGRAMA DE PÓS-GRADUAÇÃO ADMINISTRAÇÃO -  
40001016025P6


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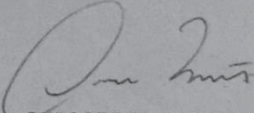
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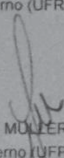
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*Dedico este trabalho a minha amada filha Julia, razão da minha existência, minha força e minha fraqueza, luz dos meus dias mais escuros, meu amor incondicional para sempre, minha melhor amiga para toda a vida; ao meu eternamente amado Kelston (in memoriam), por ter me dado nossa filha e por olhar por nós do lado de lá... e para meus amados pais Ricardo e Adyone, por serem sempre a minha fortaleza.*

## ACKNOWLEDGEMENTS

Que jornada... foram 6 longos anos de mestrado e doutorado. Digo sempre que é um constante teste de autoestima. E que teste. Em particular, muitos desafios se somaram a esse difícil período para mim. Aqueles que me conhecem sabem que não foi nada fácil chegar até aqui.

A verdade é que esse caminho acadêmico não é fácil para ninguém, mas ainda bem que não estamos sozinhos. Portanto, só tenho a agradecer a todos aqueles que estiveram ao meu lado e me ajudaram de alguma forma em algum momento dessa minha jornada.

Primeiramente, agradeço aos meus pais (e amigos) Ricardo e Adyone por me proporcionarem conforto emocional nas horas mais difíceis. Sou muito grata em ser sua filha e muito feliz por dividir essa vida com vocês. Aos avós paternos da minha filha, Rosemir e Elizabeth, pelo amor compartilhado e apoio financeiro nas despesas educacionais da Julia. Vocês têm minha admiração e eterna gratidão.

Agradeço à minha amada filhinha Julia por me acompanhar nessa jornada, enfrentando tantos desafios desde tão pequena... Tenho muito orgulho da pessoa gentil, amável e companheira que você está se tornando. Você sempre será a minha prioridade e o meu melhor projeto! E não poderia deixar de agradecer também à minha filhinha de 4 patas Bela, pela companhia nas tantas horas de isolamento de estudos, tornando nossa casa muito mais feliz.

Agradeço aos tantos amigos que fiz ao longo desse caminho e que acompanham a minha vida (e da Julia) na torcida pela nossa superação e felicidade. Represento-os aqui com um especial agradecimento às amigas Amanda, Ana Cristina e Debora que, somando as alegrias e dividindo as tristezas, compartilharam desse meu dia-a-dia de maneira mais próxima. Agradeço também à minha grande amiga (agora gringa) Ana Paula Loepper pelo pronto atendimento em dúvidas emergenciais de revisão de inglês!

Aos meus colegas de doutorado Lucas e Maiara, por dividirem esse período de desafios e incertezas comigo. Aos queridos colegas de orientação Victoria, Cecília e Rafael pelas valiosas ajudas na execução e análise de tantos experimentos. E a todos os demais colegas de mestrado e doutorado pela amizade e risos compartilhados na salinha do Marketing na UFPR.

À minha orientadora Prof<sup>a</sup>. Dr<sup>a</sup>. Danielle Mantovani, pela disponibilidade e orientação exemplar ao longo desses 6 anos. E aos demais professores doutores que participaram das etapas do meu doutoramento e contribuíram para o crescimento da minha tese: Paulo Prado, José Korelo, Vinicius Brei, Leonardo Nicolao e Paulo Baptista.

À CAPES, por proporcionar o financiamento de meus estudos.

E à espiritualidade, por me fazer enxergar a vida com um propósito muito maior do que as dificuldades pontuais que enfrentamos nessa existência em particular.

*O presente trabalho foi realizado com apoio da Coordenação de Aperfeiçoamento de Pessoal de Nível Superior - Brasil (CAPES) - Código de Financiamento 001.*

*This study was financed in part by the CAPES – Finance Code 001.*

*A vida nem sempre é como sonhamos, mas nem sempre sonhamos o que queremos viver.*

Allan Kardec

## RESUMO

As mensagens de alerta têm um propósito crucial de informar e persuadir os consumidores a entenderem os riscos associados a certos comportamentos. A literatura sugere que a conformidade com mensagens de alerta é maior quando os indivíduos entendem que podem estar em risco. Estudos anteriores mostram que emoções incidentais impactam no julgamento de risco dos indivíduos, através de tendências de avaliação cognitiva. Porém, a maioria das emoções específicas estudadas são de valência negativa. Portanto, há uma carência de estudos que investiguem como as emoções positivas incidentais podem diferentemente afetar a conformidade com mensagens de alerta. Esta pesquisa propõe que emoções positivas incidentais orientadas para o futuro (esperança), quando comparadas a emoções positivas incidentais orientadas para o passado (orgulho), têm maior probabilidade de aumentar a conformidade com mensagens de alerta por meio da percepção de risco. O risco é a percepção de vulnerabilidade que um evento negativo possa acontecer no futuro, juntamente com a percepção de gravidade do evento negativo, e nós propomos que a percepção de risco dos indivíduos pode aumentar quando suas mentalidades estão mais focadas no futuro. O estudo 1 testa nossas previsões checando o foco temporal das emoções positivas expressas em redações para indução das emoções e demonstra que a esperança incidental, comparada com o orgulho, mostra maiores níveis de percepção de risco quando expostos a um anúncio de alerta para a saúde (DSTs), o que por sua vez aumenta a intenção de conformidade com o apelo do anúncio. O estudo 2 replica o achado anterior em um outro domínio de cuidado com a saúde (hepatite). O estudo 3 mostra que o impacto do foco temporal no risco e na conformidade é contingente à orientação focada na emoção, e o efeito oposto foi observado para o foco temporal não associado às emoções específicas. Finalmente, o estudo 4 fornece evidências iniciais de que as mensagens de alerta focadas na perspectiva de ganhos podem aumentar a percepção de risco e a intenção de conformidade daqueles na orientação focada no orgulho, enquanto aqueles na orientação focada na esperança demonstraram uma maior percepção de risco e intenção de conformidade quando expostos a mensagens de alerta focadas nas perdas. Este estudo contribui teoricamente para pesquisas relacionadas ao nível de construção temporal e comportamento de risco, e para as tendências de avaliação cognitiva das emoções positivas.

Palavras-chave: Esperança, Orgulho, Emoções positivas, Mensagens de alerta, Foco temporal, Percepção de risco, Conformidade.



## ABSTRACT

Warning messages serve a critical role in informing and persuading consumers to understand the risks associated with certain behaviors. The literature suggests that compliance with warning messages is greater when individuals understand that they may be at risk. Previous research shows that incidental emotions impact on individuals' judgment of risk, through cognitive appraisals tendencies. However, most of the specific emotions studied are of negative valence. Therefore, there is a lack of studies investigating how incidental positive emotions may differentially affect compliance with warning messages. This research proposes that incidental future-oriented positive emotions (i.e., hope), when compared to incidental past-oriented positive emotions (i.e., pride), are more likely to increase compliance with warning messages through self-risk perception. Risk is the perception of vulnerability that a negative event can happen in the future, along with the perceived severity of the negative event, and we propose that self-risk perception may be increased when individuals' mind-set is more future-focused. Study 1 tests our predictions checking the temporal focus of positive emotions as expressed in emotion-elicitation essays and demonstrating that incidental hope, compared to pride, shows higher levels of self-risk perception when exposed to a health-care warning ad (STDs), which in turn increases compliance intention with the ad appeal. Study 2 replicates the previous finding in another health-care domain (hepatitis). Study 3 shows that the impact of temporal focus on risk and compliance is contingent to the emotion-focused orientation, and the opposite effect is observed when temporal focus is not associated with specific emotions. Finally, study 4 provides initial evidence that warning messages framed in gain perspective may increase the risk perception and compliance of those in the pride focused orientation, whereas those in the hope focused orientation demonstrated a higher risk perception and compliance intention when exposed to loss framed warning messages. This study contributes theoretically to research on temporal construal level and risk-taking behavior and to the cognitive appraisal tendencies of positive emotions.

Keywords: Hope, Pride, Positive emotions, Warning messages, Temporal focus, Risk perception, Compliance.

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## INTRODUCTION

Warning messages play a critical role in informing and persuading consumers to understand the risks associated with certain behaviors. Because of the enormous potential for consumer well-being and extremely high cost of warning advertising, the researchers have devoted a significant amount of time identifying ways to improve these messages (Yan & Sengupta, 2012; Murdock & Rajagopal, 2017).

Often warning messages fail to be effective when consumers do not find the outcomes sufficiently threatening (i.e., low in severity), or because they think the threat is unlikely to happen (i.e., low in vulnerability). In health-care domain, most warning messages tend to focus on long-term negative outcomes (e.g. heart disease, cancer and death), which are perceived as high in severity but low in vulnerability, because the consequences are associated with the distant future. In fact, temporal distance typically enhances positivity for oneself (Liberman, Trope, & Waslak, 2007). That is, the temporal distance may reduce the impact of warning advices, because people are generally positive about their more distant future (Wilson & Gilbert, 2005). For these reasons, the aim of many health-care warning communications is to increase individuals' perceptions of their vulnerability to render the good or bad behavior of interest more or less attractive (Chandran & Menon, 2004).

Much of the health advertising research (Block & Keller, 1995; Raghurir & Menon, 1998; Rothman & Salovey, 1997; Chandran & Menon, 2004; Menon, Raghurir, & Agrawal, 2006; Mogilner, Aaker, & Pennington, 2007; Kees, 2010; Yan & Sengupta, 2012; Murdock & Rajagopal, 2017; Chen, 2018) focuses on risk communication – how to inform consumers about health threats in order to persuade them to take actions to protect themselves from these hazards. Besides the advertisement itself (i.e., the message content and how it is framed), the individuals' emotional state is commonly associated with message effectiveness (Bagozzi, Gopinath, & Nyer, 1999; Tiedens & Linton, 2001; Raghunathan & Trope, 2002; Keller, Lipkus, & Rimer, 2003; DeSteno et al., 2004; Agrawal, Menon, & Aaker, 2007; Griskevicius, Shiota, & Neufeld, 2010; Agrawal & Duhachek, 2010; Duhachek, Agrawal, & Han, 2012; Han, Duhachek, & Agrawal, 2014).

Literature shows that in general negative affect inflated and positive affect deflated likelihood estimates for the occurrence of negatively toned events (DeSteno et al., 2004). The positive emotional state increases individuals' self-positive bias - a false sense of security that lead people to believe that the outcome may occur for others, but not for them (Raghurir &

Menon, 1998; Yan & Sengupya, 2012). Regardless of age, occupational status, gender, or level of education (Weinstein, 1987), people tend to perceive themselves in a positive light (Alicke et al., 1995), presenting a kind of unrealistic optimism that underestimates the probability of a negative outcome occurring (Agrawall, Menon, & Aaker, 2007) – such as having an accident (Robertson, 1977), becoming ill (Perloff & Fetzer, 1986), contracting AIDS (Raghubir & Menon, 1998), or hepatitis (Menon, Block, & Ramanathan, 2002).

Furthermore, past research (e.g. Mackie & Worth, 1989; Schwarz, Bless, & Bohner, 1991) shows that positive affect leads people to process messages with less cognitive effort. Individuals in a negative state are motivated to engage in detail-oriented systematic processing, gathering information to figure out how to improve their situation. In contrast, individuals in a positive state have little reason to invest energy in effortful processing (Griskevicius & Neufeld, 2010). Therefore, positive affect typically leads to lower attention and awareness about important preventive issues in health-care communication domain (Agrawall, Menon, & Aaker, 2007).

Health literature states that individuals are differently persuaded by warning messages due to their differently self-risk perception (Raghubir & Menon, 1998; Menon, Block, & Ramanathan, 2002; Agrawall, Menon, & Aaker, 2007). Thus, one of the biggest challenges in health-care advertising is overcoming the audience's underestimated vulnerability and raising personal risk estimates, especially when the target is in a positive mood state (Salovey et al., 2000). For example, Carnival is a festival held in Brazil every year in summer season. The country unifies completely for almost a week and festivities are intense. The party includes live music, street performances, dancing, but also abusive drinking and inconsequential sexual behavior. Against these public health problems, the Brazilian government promotes advertising campaigns every year during the festive season to alert the public about the consequences of risky behaviors, such as car accidents after drinking alcohol and the spread of STDs in unprotected sex (Governo do Brasil. Ministério da Saúde, 2018). This audience is usually in a more positive mood state when exposed to the warning messages during this festive season, making the effectiveness of these preventive ads even more challenging.

What factors could encourage people in a positive affective state processing warning messages about health-care preventive measures? The literature shows that emotions can play an influential role on individuals' future choices through cognitive appraisals tendencies (Smith & Ellsworth, 1985; Lerner & Keltner, 2000; Winterich & Haws, 2011; So et al., 2015). Therefore, the appeal to the emotions as sources of leverage in persuasion could be

part of warning campaigns strategy to increase individuals' perception of risk for themselves (Agrawall, Menon, & Aaker, 2007).

Extant research has focused largely on the incidental impact of specific emotions on outcomes involving risk judgments (Lerner & Keltner, 2000, 2001; Koutchaki, Oveis, & Gino, 2014; Ferrer et al., 2016). Lerner and Keltner (2000, 2001) showed that the negative emotion of fear, comparing to anger, leads individuals to make less risk-taking choices. Koutchaki, Oveis and Gino (2014) showed that guilt also influences individuals to adopt risk-taking behaviors. And in a more recent work, following Lerner and Keltner (2000, 2001), Ferrer et al. (2016) showed that sadness, also compared to anger, leads individuals to greater risk-averse choices. Such findings underscore the important role of incidental emotions in influencing subsequent risk-related outcomes, but most of the specific emotions studied are of negative valence. There is scarce research investigating the incidental impact of specific positive emotions on individuals' judgment of risk (for exception, see Agrawall, Menon, & Aaker, 2007).

Some may ask why then not employ incidental negative emotions as an intervention strategy to improve the warning ad effectiveness, since negative affective state seems to be more efficient in getting individuals to process information about health risks. First, people without apparent health problems typically engage in defensive tendencies to avoid the message in preventive health contexts (Cho & Sands, 2011). And second, a negative affective intervention may increase the chance of backfire because people in positive mood, in an attempt to maintain their positive emotional state, may respond with aversion (Bagozzi & Moore, 1994; Larsen, 2000; Kim, Park, & Schwarz, 2010; Di Muro & Murray, 2012) to a negative emotion strategy before processing the health information ad, or even respond with reactance (Brehm, 1966; Brehm & Brehm, 1981; Laurin et al., 2013; Graton, Ric, & Gonzales, 2016) upon perceiving the attempt to persuade them with a negative emotion strategy.

Therefore, the argumentation so far raises relevance about analyzing the incidental impact of specific positive emotions on the effectiveness of health-care warning messages. In sum, the reasons are: 1. The audience of preventive health communication is often in a positive mood state (e.g. STDs campaign in Carnival season) and positive affective state leads individuals to a lower risk perception (less cognitive effort and higher self-positive bias); 2. The incidental effect of specific emotions may increase self-risk perception through cognitive appraisal tendencies, but most of emotions studied are of negative valence; 3. Incidental negative emotions as a persuasion strategy may backfire because people in a positive affective

state could respond with aversion and/or reactance; 4. Incidental positive emotions as a persuasion strategy could improve effectiveness of health-care warning messages, but there is a lack of studies investigating this relationship.

To address this gap, we draw on health communication literature to propose that the extent to which people's mind-set are future-oriented is likely to have a positive impact on preventive information processing (Strathman et al., 1994; Simons et al., 2004; Bearden, Money, & Nevins, 2006). Our premise is that future appraisal tendency of specific positive emotions has a positive impact on individuals' self-risk perception when exposed to health-care warning messages, which in turn increases compliance with the warning appeal. Therefore, to show how incidental positive emotions may differentially affect compliance with warning messages, we consider two specific positive emotions with contrasting temporal focus – hope and pride.

Hope is a future-oriented emotion that motivates individuals to think about goals to be achieved in the future, whereas pride is a past-oriented emotion that leads individuals to think about goals achieved in the present or recent past, but not in the future (Roseman, 1984; Tong, 2015; So et al., 2015). We reasoned that the warning message generates more self-risk perception and compliance when the consumer's mind-set is more future- than past-oriented. We argue that it is necessary to be concerned about the future to better recognize threats that may happen to the self in the future (Simons et al., 2004). When individuals are less concerned about the future, they may consider the potential hazard as less probable and the warning appeal may not be so effective on getting their compliance.

We conduct four experiments to show that a future-focused hopeful (vs. past-focused proud) mind-set better recognizes the self-risks inherent in a health-care warning message and leads to increased compliance with the requested preventive behaviors. Moreover, we show that the impact of temporal focus on risk perception and compliance with warning messages is contingent to the emotion-focused orientation, and the opposite effect is true for the temporal focus not associated with specific emotions. In addition, we show initial evidence for the impact of loss and gain message frames on the relationship between incidental emotion and responses to warning messages. When messages are gain framed, incidental pride increases risk perception and compliance, whereas loss framed messages are more persuasive for those in the hope affective state.

This study contributes to the literature on temporal construal level and risk-taking behavior (Sagristano, Trope & Liberman, 2002; Trope & Liberman, 2010; Lerner et al., 2001) showing evidences that highlight the opposite effect for temporal focus when it is driven by



emotions. Also, this study contributes to the literature of positive emotions and cognitive appraisal tendencies (Smith & Ellsworth, 1985; Lerner & Keltner, 2000, 2001; Lerner, Han, & Keltner, 2007; Han et al, 2007; So et al., 2015; Ferrer et al., 2016) by demonstrating the affective influence on perceptions about possible consequences in the future, such as in preventive information processing. And finally, this study adds to extant work in health literature (Maheswaran & Chaiken, 1991; Menon, Block, & Ramanathan, 2002; Passyn & Sujan, 2006; Menon, Raghurir, & Agrawal, 2006) the role of specific positive emotions (i.e., hope and pride) as a factor that affects individuals' compliance with health-care warning messages.

Given the prevalence of hope and pride in consumer experience, it seems interesting to understand how these two positive emotions impact the way consumers process information and make subsequent decisions in the preventive domain. This is especially important in public policy action because managers may appeal to incidental positive emotions as a persuasive strategy for preventive ads that are particularly harder to reach the public that is in a positive emotional state. Managerial implications are discussed in more details further.

## THEORETICAL BACKGROUND

### Emotions and Cognitive Appraisal Tendencies

Emotions can be understood as a subjective experience triggered by an external (e.g., environmental) or internal (e.g., a thought) stimulus event. Consciously, or not, a complex reaction to the evaluation of this event is triggered by presenting responses such as facial expressions, physiological changes, and cognitive process (Fredrickson, 2001). In general, emotions can be classified as primary or secondary. Primary emotions are innate and are also called as basic emotions. The main characteristic of such emotions is the facial expressions shared by all. There are six basic emotions: joy, sadness, anger, fear, surprise, and disgust (Lewis, 2000). Secondary emotions, also called as self-conscious emotions, are those that result from social learning. These emotions require self-evaluation that are, in part, shaped by society. Individuals internalize the norms and standards of their culture as self-representations. Through self-evaluations guided by those self-representations, the self-conscious emotions motivate behaviors towards stipulated goals (Tracy & Robins, 2004). The set of self-conscious emotions includes: embarrassment, envy, shame, guilt, empathy, hope and pride (Lewis, 2000).

There is a consensus that emotions are characterized by specific patterns of cognitive appraisals that influence the perceptions of subsequent situations and guide behaviors (Lazarus, 1991). According to the Appraisal-Tendency Framework (ATF; Smith & Ellsworth, 1985; Lerner & Keltner, 2000; Lerner, Han, & Keltner, 2007; Han et al, 2007), central appraisal patterns associated with each emotion activate a cognitive predisposition, called cognitive appraisal tendency, that leads individuals to evaluate the subsequent event consistent with the fundamental appraisal that characterizes the emotion (So et al., 2015). Those appraisals tendencies may influence subsequent judgments and decisions, even when the judgments are normatively unrelated to the cause of an emotion (Lerner & Keltner, 2001).

Appraisal tendencies are affective processes through which emotions exert effects on judgment and choice until the emotion-eliciting problem is resolved. This process applies to the effect of both momentary and dispositional emotions: momentary emotions refer to immediate affective reactions to a target, whereas dispositional emotions refer to the tendency to react with specific emotions across time and situations (Tiedens & Linton, 2001).

Therefore, these processes have been found to influence subsequent events' judgments and choices even when such events are not related to the emotion cause – what is called incidental effect (Lerner & Keltner, 2001).

Although the exact number of appraisals and the precise terminology used to describe appraisal dimensions differ (see Smith & Ellsworth, 1985; Lazarus, 1991; Ellsworth & Scherer, 2003), many researchers agree that emotions are characterized by a specific pattern of cognitive appraisals that shape perceptions of subsequent situations and guide behaviors. Therefore, understanding which appraisals are likely to trigger each process allows researchers to predict the effects of specific emotions on individuals' behaviors.

Investigations of affective incidental effect have mainly examined the impact of valenced moods induced in one situation on cognition in another situation (Raghunathan & Trope, 2002; Keller, Lipkus & Rimer, 2003; Agrawall, Menon & Aaker, 2007). However, the literature (Lerner & Keltner, 2000, 2001; Ferrer et al., 2016) has shown that emotions of the same valence can sometimes influence judgment in opposite ways – a proposition that contradicts predictions from valence accounts and therefore provides a useful point for comparing valence and appraisal-tendency approaches (Tiedens & Linton, 2001; Waters, 2008). Therefore, each emotion present tendencies to perceive new events and objects in ways that are consistent with the original cognitive-appraisal dimensions of the emotion, beyond valenced-mood states only. In this research, we draw on cognitive-appraisal theories of emotion to outline how specific emotions of the same valence (i.e., positive) differentially influence judgments and choice outcomes because of variation on another cognitive appraisal – temporal dimension (Smith & Ellsworth, 1985; Lazarus, 1991).

### **Temporal Appraisal Dimension: Temporal Focus of Hope and Pride**

The temporal appraisal dimension represents the temporal focus of emotions (Lazarus, 1991; Smith & Ellsworth, 1985) and was one of the four dimensions most frequently mentioned on Reisenzein and Hofman (1990) investigation of emotions cognitive appraisals dimensions.

Temporal focus is defined as the attention individuals devote to thinking about the past, present, and/ or future (Shipp, Edwards, & Lambert, 2009). Aging and life events can influence individuals' temporal focus in a deeper way, but stimulus such as affective states can substantially shift individuals' momentary attention (Shipp & Aeon, 2018). As a

dispositional state of attention at a moment in time, incidental emotions can change individuals' temporal focus through their temporal appraisal tendencies.

Therefore, the temporal appraisal dimension is a cognitive appraisal that represents the extent to which an emotion results in future-, present- or past-oriented action tendencies (Winterich & Haws, 2011). The central idea of appraisal theories is that emotions exist in bipolar categories (Bagozzi & Gopinath, 1999), forming a set of dimensions along which emotions can be organized and identified as similar or different from each other. As the main effect of interest in our research is the carry-over impact of temporal appraisal, we will consider two positive emotions – hope and pride – which are characterized by contrasting temporal focus (Smith & Ellsworth, 1985).

Hope is defined as a positive emotion evoked in response to an uncertain, but possible goal-congruent outcome (MacInnis & Mello, 2005). Snyder's theory of hope states that hope consists of reality-based appraisals of the wills and the ways of achieving goals (Snyder et al., 1991). Specifically, hope includes agency – goal-directed energy, and pathways – planning to achieve the goal (Snyder & Lopez, 2002). Hope is a goal-oriented emotion induced through the identification of a desired outcome that is believed to be possible and predicated for events in the future (Kemp et al., 2017). As an anticipatory emotion, hope is currently experienced due to the prospect of a future event will happen or not (Baumgartner, Pieters, & Bagozzi, 2008). From an evolutionary perspective, hope is responsible for the activation of perceptions that goals can be met (Snyder et al., 1991). People feeling hope imagine the behaviors they can perform to reach the goal and visualize the pleasure when the desired outcome materializes (Baumgartner, Pieters, & Bagozzi, 2008). Consistent with this description, hope is described as a goal-oriented, positive-valenced and future-oriented emotion (Ellsworth & Smith, 1988; Lazarus, 1991).

Pride is closely associated with success and is typically experienced when people have achieved important goals in life (Cheng, Tracy, & Henrich, 2010; Huang, Dong, & Mukhopadhyay, 2014). Similar to hope, pride is also a pleasurable goal-oriented emotion, but it comes after the goal attainment (Mantovani, Andrade, & Prado, 2018). It is worth explaining that self-conscious emotions, such as pride, are elicited when individuals direct attentional focus to the self, activating self-representations, and appraise an emotion-eliciting event as relevant to those representations. In the case of pride, the event also must be congruent with positive self-representations, and individuals then must make a series of causal attributions (Tracy & Robins, 2007). Individuals experiencing pride tend to think that they, not external factors, are controlling and are responsible for the positive outcomes in their

lives, which might promote positive behaviors in the achievement domain and contribute to the development of a genuine and deep-rooted sense of self-esteem (Lazarus, 1991). Contrary to the future appraisal of hope, pride arises from a past situation and shows high level of certainty and control about the event (Tong, 2015). Consistent with this description, pride is also described as a goal-oriented, positive-valenced, but past-oriented emotion (Ellsworth & Smith, 1988; Lazarus, 1991).

Hope and pride share some similarities, such as the positive valence, the goal orientation, but distinguished temporal focus. Therefore, the literature states that hope as an experienced emotion tends to be characterized by a future-oriented temporal focus whereas pride is characterized by a past-oriented temporal focus. That is, incidental feelings of hope, compared to pride, tend to lead individuals to construe events with greater future oriented temporal focus. Therefore, we theorize that such temporal cognitive appraisal tendency may have impact on subsequent behaviors, such as self-risk perception in preventive domain.

### **The Impact of Temporal Focus on Risk Perception**

The concept of temporal focus is important because it affects how people incorporate perceptions about past experiences, current situations, and future expectations into their attitudes, cognitions, and behaviors (Shipp, Edwards, & Lambert, 2009). Past research on temporal construal already demonstrated that individuals can construe events in different temporal perspectives (Liberian & Trope, 1998; Martin, Gnoth, & Strong, 2009; Winterich & Haws, 2011). An event is psychologically distant as it takes place into the future, whereas an event is psychologically closer as it takes place into the present or past (Trope & Liberman, 2000). That is, people can experience different temporal perspectives as they mentally construe events psychologically distant or closer in the dimension of time (Trope, Liberman, & Wakslak, 2007).

Individuals experiencing different temporal perspectives may also show different subsequent outcomes (Baumgartner, Pieters, & Bagozzi, 2008). Liberman, Trope and Wakslak (2007) states that the perspective of future temporal distance raises the questions of taking actions for future goals (e.g., self-control). For instance, Winterich and Haws (2011) show that consumers experiencing a future-oriented positive emotion demonstrates higher self-control in subsequent decisions compared to past- or present-oriented positive emotions. As such, Fujita et al. (2006) had proposed that individuals experiencing positive affect can be

more aware of long-term goals if their affective experience includes appraisals characterized by future-oriented cognitions.

Typically, future orientation has been considered as a general concern with the future (Strathman, Gleicher, Boninger, & Edwards, 1994). Simons et al. (2004) state that future temporal orientation serves as a cognitive-motivational factor that may result in a greater ability to construe distant events. The authors explain that people with a future temporal orientation experience the psychological distance toward a given future event as psychologically much closer than people with a past or present temporal orientation. As such, the extent to which people's mind-set are future-oriented is likely to have an important impact on information processing, with important psychological consequences, such as beliefs about personal vulnerability to future threats (Bearden, Money, & Nevins, 2006).

Perception of vulnerability that a negative event can happen in the future is one of the two dimensions that form the construct of risk, along with the perceived severity of the negative event (Chen, 2018). Both vulnerability and severity need to reach adequate levels in order to elicit risk perception (Murdock & Rajagopal, 2017). Risk, according to the Merriam-Webster online dictionary, is defined as the possibility of loss or injury (Merriam-Webster, 2018). In consumer behavior literature, risk is generally understood as negatively-valenced likelihood assessment that an unfavorable event will occur and is closely associated with greater precautionary behaviors of individuals (Menon, Raghurir, & Agrawal, 2006; Brewer et al. 2007).

Past research (Block & Keller, 1995; Menon, Block, & Ramanathan, 2002; Chandran & Menon, 2004; Kess, 2010; Lin, Chang, & Lin, 2012; Murdock & Rajagopal, 2017; Chen, 2018) suggest that high levels of perceived self-risk would result in higher intentions to engage in preventive behaviors and we argue that self-risk perception may depend on how concerned individuals are with their future. Strathman et al. (1994) suggest that future research could address factors that contribute to the ways in which individuals become more concerned about the future consequences of their behaviors. Simons et al. (2004) suggest investigating the difference in individuals' attention to the future. Kess (2010) suggests to exam if it is possible to prime temporal orientation in the context of warning advertising. In responding to these calls, we argue that temporal orientation can be primed through incidental emotions due to their temporal appraisal tendencies: future versus past temporal-focused emotions lead individuals to present contrasting temporal orientations. Thereby, we theorize that temporal orientation of emotions may impact subsequent self-risk perceptions in the preventive domain.

Previous research has investigated the impact of specific emotions on outcomes involving risk judgments (Lerner & Keltner, 2000, 2001; Koutchaki, Oveis, & Gino, 2014; Ferrer, Maclay, Litvak, & Lerner, 2016). However, most of the emotions studied are of negative valence and/ or their effects are related to cognitive appraisals other than temporal focus. For example, Lerner and Keltner (2000, 2001) found that the sense of certainty and control associated with anger should lead angry individuals to make risk-seeking choices, whereas the sense of uncertainty and lack of control associated with fear should lead fearful individuals to make risk-averse choices. Ferrer et al. (2016) compared anger to sadness and found that anger also leads to increased risk-taking behavior because of the higher levels of certainty and control cognitive appraisals. Koutchaki, Oveis, and Gino (2014) showed that guilt influences risk-taking behavior by enhancing one's sense of control and optimism about risks for the self.

Note that risk judgment's outcomes involving risk-taking behavior is subtly different from those involving the domain of our research – preventive behaviors. The preventive behavior performs actions to avoid the threat from materializing, while the risk-taking behavior performs actions despite the risk that an undesirable outcome may occur (Rothman & Salovey, 1997). The impact of warning messages that emphasize personal vulnerability is predicated on the assumption that people will adopt behaviors to reduce the likelihood of experiencing an unwanted outcome (Menon, Raghurir, & Agrawal, 2006). Prevention behaviors focus on averting the development of a problem, providing people with the opportunity to maintain their present status and reduce the risk of such future threats (Chandran & Menon, 2004). That is, in the preventive behavior's domain, the choice of not adopting the requested behavior is the risky option.

One of the few examples that we have found so far in the literature that analyzes the effect of incidental positive emotions on the perception of risk involving preventive behaviors, is the study by Agrawal, Menon, and Aaker (2007). The authors showed that the compatibility between the relatedness appraisal dimension of incidental positive emotions (happiness/ self, peacefulness/ other) and the message referent (consequence to the self or to the others) fostered the processing of health information and the perception of risk.

Nevertheless, studies analyzing the effect of temporal perspective on risk perception involving preventive behaviors are frequent, but at the message framing analysis level. For example, Chandran and Menon (2004) used the construal level theory (CLT) to demonstrate that temporal frame describing threat events as happening either “every day”, compared to “every year”, were perceived as closer in time, more concrete, and more probable, which

increased risk perceptions. Kees (2010) showed that consumers who are less future-oriented benefit most from messages displayed in a proximal (versus distal) format, while those more future-oriented recognize the potential risks events in the warning message regardless of how it is framed. Murdock and Rajagopal (2017) demonstrated that adding a social consequence of the negative health outcome in the message frame makes the outcome seem closer in time and therefore more likely to occur, increasing the perception of self-risk.

Thereby, to fill this theoretical gap, our research combined the literature of emotional cognitive appraisals and compliance with warning messages by analyzing the incidental impact of specific positive emotions with contrasting temporal focus on preventive behaviors domain. As such, given that hope is characterized by a future temporal focus (Lazarus, 1991; Winterich & Haws, 2011) and recalling that a future orientation enhances the awareness about long-term goals (Simons et al., 2004; Fujita et al., 2006; Liberman, Trope, & Wakslak, 2007), we argue that temporal focus underlies the extent to which positive emotions impact perceptions of self-risk. Therefore, we propose that individuals primed with a positive future-oriented mind-set (i.e., incidental hope) should better recognize potential risk events in a warning message by showing greater self-risk perception, when compared to those individuals primed with a positive past-oriented mind-set (i.e., incidental pride).

Thus, we propose the first hypothesis of our research:

**H1:** The incidental effect of hope, compared to pride, leads consumers to show higher self-risk perception when exposed to health-care warning messages.

### **The Mediating Role of Self-Risk Perception in Compliance with Warning Messages**

According to our theorization so far, temporal aspects of consumers mind-sets may play an important role on individuals judgment, especially when it comes to self-risk perceptions. Because temporal perspective can play an important role in decision making of long-term goals (Simons et al., 2004; Fujita et al., 2006; Liberman, Trope, & Wakslak, 2007; Winterich & Haws, 2011), understanding how individuals focus their attention toward the temporal dimension clarifies their responses to temporal information, such as preventive alerts (Shipp, Edwards, & Lambert, 2009).

Everyday people are confronted with a wide variety of uncertain situations, and how they will solve them depends on their likelihood judgment of such events occurring (Menon,



Block, & Ramanathan, 2002; Menon, Raghurir, & Agrawal, 2006). Previous literature (Block & Keller, 1995; Menon, Block, & Ramanathan, 2002; Chandran & Menon, 2004; Kees, 2010; Lin, Chang, & Lin, 2012) suggests that consumers' compliance with warning messages may be influenced by their self-risk judgments. Theories of health behavior suggest that the greater is an individual's perceived risk, the greater is their intention to alter behavior to reduce such risk (Block & Williams, 2002; Brewer et al., 2004, 2007; Waters, 2008; Kees, 2010; Chen, 2018). Therefore, it is imperative to take risk perceptions into consideration when ensuring the persuasiveness of a health-care warning message (Lin, Chang, & Lin, 2012).

Literature suggests that differences in temporal orientation may cause consumers to respond differently to time-oriented messages in advertising (Bearden, Money, & Nevins, 2006), and we argue that the effectiveness of a warning message may depend on how concerned individuals are with their future. We propose that the extent to which people are future-oriented tends to have a positive impact on information processing of self-risk judgment, and we argue that the effectiveness of a warning message depends on self-risk perceptions generated. As such, we hypothesized that a future-oriented mind-set will better recognize the self-risks inherent in a warning message, and we propose that such increased self-risk perception in turn will result on increased compliance with the preventive behaviors requested by the warning message.

Therefore, we propose that individuals primed with a positive future-oriented mind-set (i.e., incidental hope), when compared to those individuals primed with a positive past-oriented mind-set (i.e., incidental pride), will present greater compliance with the warning appeal due to a greater self-risk perception.

Thus, we propose the second hypothesis of our research:

**H2:** The incidental effect of hope, compared to pride, leads consumers to show higher compliance with health-care warning appeals (a) mediated by self-risk perception (b).

### **Temporal Focus, Emotions and Risk Perception**

There is a vast literature that explores individuals' risk-judgment in order to respond to the question as to what generates people's inconsistency in risk-taking/ -aversion behavior (Liberman, Sagristano, & Trope, 2002; Sagristano, Trope & Liberman, 2002; Chandran &

Menon, 2004; Forster & Higgins, 2005; Gino & Margolis, 2011; Lerner et al., 2015). That is, what factor contributes to the common observation that one sometimes chooses to play it safe when faced with risky situations and other times not (Lerner et al., 2015).

Lerner et al. (2015) are one of those that addressed this issue using the Construal Level Theory (CLT; Trope & Liberman, 2010) to demonstrate that abstract mind-set (higher CL) increases, and concrete mind-set (lower CL) decreases risky-taking behaviors in the gain domain (Lerner et al., 2015). The CLT predicts that abstract construals promote sensitivity to desirability (e.g. value of the outcome) whereas concrete construals promote sensitivity to feasibility (e.g. probability of winning/ losing). In terms of risk-taking behavior, in a game of chance for example, abstract thinkers should focus more on the positive aspects of a risky task (Liberman, Sagristano, & Trope, 2002). Sagristano, Trope and Liberman (2002) showed the first evidences about the influence of CL on risk preferences by manipulating temporal distance and showing that participants were willing to take more risks in distant-future (abstract CL) than in the near-future (concrete CL).

The main idea of CLT is that the psychological distance to a target (i.e., event or object) influences and is influenced by the level of mental construal. In related studies on abstract versus concrete processing, Liberman and Trope (1998) demonstrated that imagining an event in a distant temporal perspective leads to the use of higher-level construals (abstract CL), whereas imagining the event in a near temporal perspective leads to the use of lower-level construals (concrete CL).

Therefore, the effect of CL on risk-taking behavior indicates that concrete thinkers are less risk-taking than abstract thinkers, and such processing styles can be primed by the temporal perspective of individuals' mind-set (Sagristano, Trope, & Liberman, 2002). The CLT predicts that future temporal perspective (psychologically distant) leads to more abstract CL processing, which in turn lead to greater risk-taking behavior than individuals primed with present/past temporal focus (psychologically closer).

However, we argue that temporal perspective mind-set when associated with specific emotions should take into account the emotion cognitive appraisals above the CL when processing a risk-related information. We suggest that future-oriented hopeful mind-set (that is characterized by an abstract CL processing style) should lead individuals to lower risk-taking (i.e., greater risk perception and preventive behavior) when compared to past-oriented proud mind-set (that is characterized by a concrete CL processing style). This is the opposite effect predicted by CLT and we argue that this occurs because cognitive appraisals of hope and pride are temporal oriented and are also related to goal attainment.

Cognitive appraisals of hope are related to goals to be achieved in the future and those of pride are related to goals already achieved in the present or recent past (Roseman, 1984; Tong, 2015; So et al., 2015). The appraisals and corresponding action tendencies of pride are indeed related to greater risk-taking because the certainty about the success in the past and stronger appraisals of responsibility and control lead the individual to attempt to a greater reward in the future (Roseman & Evdokas, 2004; Tracy & Robins, 2004; Tong, 2015). Therefore, the temporal focus associated with this emotion (pride) is likely to decrease risk perception in the future when compared to hope. On the other side, hope is characterized by low perception of control and responsibility and stronger uncertainty about being successful at reaching the goal because it has not been achieved yet, which increase the risk perception that something wrong could happen in the future (Lazarus, 1991; MacInnis & de Mello, 2005; Winterich & Haws, 2011; Tong, 2015).

We argue that the impact of temporal focus on risk perception and compliance with warning messages are contingent to the emotion-focused orientation. That is, when individuals are future oriented with hope feeling, the risk perception and compliance should be higher compared to those that are past-oriented with pride feeling. The opposite should be observed for the temporal focus not associated with specific emotions, where CLT is the information processing mechanism that will prevail.

Thus, we propose the third hypothesis of our research:

**H3:** The incidental effect of temporal focus on individuals' risk judgment outcomes shows an opposite effect when associated with specific emotion. That is, future temporal focus associated with hope feeling shows higher self-risk perception and compliance compared to past temporal focus associated with pride feeling; whereas future temporal focus not associated with emotion shows lower self-risk perception and compliance when compared to past temporal focus not associated with emotion.

### **The role of Gain versus Loss Message Frames**

The role of the message frame is an interesting issue to explore in communication when it comes to evaluating the effectiveness of a warning message persuasion. Warning messages can be framed in terms of its costs (loss frame) or benefits (gain frame) associated

with specific behaviors, and the framing of such persuasive messages can influence decision making even when the two frames describe objectively equivalent situations (Rothman, & Salovey, 1997; Mogilner, Aaker, & Pennington, 2007).

In a health-care public service campaign, gain-framed warning messages highlight the positive outcomes to be experienced by complying with behavioral recommendations, whereas loss-framed warning messages emphasize the negative consequences to be experienced by not complying with behavioral recommendations (Block & Keller, 1995; Cho & Sands, 2011). Although to ask people to take into account a health issue in terms of associated costs is considered an effective way to motivate preventive behaviors (Maheswaran & Chaiken, 1991), the gain message frame can be more effective in specific cognitive and affective process such as in regulatory focus fit (Kim, 2006). That is, the relative effectiveness of gain-framed or loss-framed appeals depends, in part, on whether individuals' goal attainment strategies are focused on promotion or prevention behaviors (Kim, 2006; Mantovani, Andrade, & Prado, 2018).

The regulatory focus theory (for a review, see Higgins, 1998) states that promotion focus is related to being oriented towards attaining gains as positive outcomes, whereas prevention focus is related to being oriented toward avoiding losses as negative outcomes (Higgins, et al., 2001; Grant & Higgins, 2003). Mantovani, Andrade and Prado (2018) showed that goal attainment influences the state's regulatory focus, which in turn influence consumers' subsequent preferences for persuasive messages framed on gain versus loss focus. This reasoning suggests that the persuasiveness of the warning message will be the highest when loss-framed information fits the prevention regulatory focus and when gain-framed information fits the promotion regulatory focus of individuals (Lee & Aaker, 2004; Cesario, Grant, & Higgins, 2004).

Although the appraisals and action tendencies associate pride with higher risk-taking motivation (Tracy & Robins, 2004; Wilcox, Kramer, & Sen, 2010; So et al., 2015; Weidman, Tracy, & Elliot, 2016), pride as a consequence of goal attainment also has a positive effect on consumers' preferences for gain message frame (Mantovani, Andrade, & Prado, 2018). Therefore, we argue that individuals primed with past-oriented pride should show higher risk perception and compliance with a gain-framed health-care warning message, compared to a loss-framed health-care warning message. Following the same logic, hope as a consequence of a goal not yet achieved should have a positive effect on consumers' preferences for loss message frame, as their appraisals and action tendencies are associate with lower sense of control and higher uncertainty, which is related to possible losses and risk-aversion

tendencies. Thus, we argue that individuals primed with a future-oriented hope should show higher risk perception and compliance with a health-care warning message framed in loss focus than gain focus, and vice versa.

Thus, we propose the forth hypothesis of our research:

**H4:** The mediation effect of self-risk perception between incidental emotions and individuals' compliance with health-care warning messages is moderated by the message frame. That is, incidental hope should show higher self-risk perception and compliance when the message frame is focused on losses than gains; whereas incidental pride should show higher self-risk perception and compliance when the message frame is focused on gain than losses.

The role of gain and loss message frames is a special issue to address in our research because it can show further evidences about the proposed effect of future- and past-oriented positive emotions on consumers' self-risk perception and compliance in the domain of health-care warning messages.

## METHOD

### Overview of Studies

Across four experiments, we test our basic hypotheses regarding the incidental effect of specific positive emotions (i.e., hope and pride) in the domain of health-care preventive behaviors. We propose that incidental hope results in higher self-risk perception and compliance intention relative to pride based primarily on the future-focused temporal appraisal of hope versus past-focused temporal appraisal of pride.

Study 1 demonstrates the positive impact of incidental hope (vs. pride) on self-risk perception and compliance intention with a health-care warning message. Study 2 replicates the previous findings in a different domain of health-care warning message. Study 3 shows that when the future temporal focus is associated with the feelings of hope (vs. no emotion oriented), self-risk perception and compliance intention are higher. However, self-risk perception and compliance intention are higher in the past temporal focus when it is not emotion oriented (vs. pride-oriented). Finally, study 4 directly compares loss and gain message frames in order to explore further evidences about the proposed effect of incidental hope versus pride in self-risk perception and compliance intention with health-care warning messages.

### Pre-test

Writing tasks are frequently used to induce emotions (Lerner & Keltner, 2001). We pre-tested the use of written essays to induce the intended emotional states and to check their expected temporal focus.

### PARTICIPANTS AND DESIGN

A total of one hundred undergraduate students (mean age: 21.2 years, SD: 4.6; 54% male) completed the lab study in exchange for course credit. The experiment employed a

single factor (hope vs. pride vs. neutral) between-subjects design. The students were randomly assigned to one of the three emotional state conditions.

## PROCEDURE

As a cover story, participants were told that they were taking part in an emotion experiment that aims to understand some decision criteria of undergraduate students. We borrowed a writing task from previous works to manipulate the emotions (Tracy & Robins, 2007; Winterich & Haws, 2011; Huang et al., 2014). We induced the relevant emotional state by asking participants to write about a situation in which they felt the emotion (i.e., hope and pride). Participants in the hope condition read the following manipulation: *At this moment, we would like you to think about a situation in which you feel hopeful for something you would like that happens to you in some time in your life in the future. Thinking about this future situation of hope, write in the next few lines about this event in as much detail as possible. Try to describe the situation so that if someone read it would feel hopeful, just to know about it. How is to be in this situation? What reasons do you feel hopeful that this situation can materialize in a positive way for you in the future?* In the pride condition, participants read the following instructions: *At this moment, we would like you to think about a situation in which you feel proud for something that happened to you in some time in your life in the past. Thinking about this past situation of pride, write in the next few lines about this event in as much detail as possible. Try to describe the situation so that if someone read it would feel proud, just to know about it. How is to be in this situation? What reasons do you feel proud about this situation that happened to you in the past?* Participants in the control condition were asked to describe a step-by-step guide on how to do the dishes (see appendix A for the full script of the writing tasks instructions).

Right after the writing task, participants indicated the extent to which they were experiencing each of four emotion words (happiness, hope, pride, sadness), which were randomly ordered, on a 7-point scale (1 = I do not feel the emotion at all, and 7 = I really feel the emotion).

Next, participants of the pre-test rated their essays' temporal focus (Winterich & Haws, 2011), using one item on a 7-point scale (1 = in the past, and 7 = in the future). The temporal focus of participants' essays was examined to check the temporal focus appraisal triggered by the intended emotions, that is a suggested mechanism through which positive emotions influence subsequent risk-related outcomes.

## RESULTS

### *Manipulation Checks*

*Emotions.* A one-way ANOVA shows that self-reported hope presents a significant difference between the three emotional state conditions ( $F(2, 97) = 115.79, p < .001$ ), as well as self-reported pride ( $F(2, 97) = 44.52, p < .001$ ). Planned contrasts indicated that self-reported hope in the hope condition ( $M_{\text{hope}} = 6.36; SD = .86$ ) was greater than for pride ( $M_{\text{pride}} = 5.32; SD = 1.39, p < .001$ ) and neutral conditions ( $M_{\text{neutral}} = 1.88; SD = 1.43, p < .001$ ). As well as self-reported pride was greater for those in the pride condition ( $M_{\text{pride}} = 6.79; SD = .41$ ) than for hope ( $M_{\text{hope}} = 5.36; SD = 1.41, p < .001$ ) and neutral conditions ( $M_{\text{neutral}} = 3.73; SD = 1.79, p < .001$ ). In addition, there was no effect of sadness across conditions ( $p$ 's  $> .20$ ). Also, there was no statistical difference on happiness score between the two positive emotion conditions ( $M_{\text{hope}} = 5.97; SD = 1.10$ ; vs.  $M_{\text{pride}} = 6.47; SD = .788, p = .246$ ), but there was statistical difference for happiness between the positive emotional state and the neutral condition ( $M_{\text{neutral}} = 2.73; SD = 1.50, p$ 's  $< .001$ ). This is not surprising, since happiness is one of the least differentiated positive emotions and that it is often used as a generic description of positive affect (Ellsworth & Smith, 1988; Winterich & Haws, 2011). Therefore, it was expected that individuals in a positive affective state could self-report high scores of happiness as well. As such, these results indicate that the writing task successfully induced the intended emotional states of hope, pride and neutral.

*Temporal Focus.* A one-way ANOVA shows that self-reported temporal focus presents a significant difference between the three emotional state conditions ( $F(2, 97) = 22.95, p < .001$ ). Planned contrasts showed that participants in the hopeful writing task condition reported a greater future-focus on their essays ( $M_{\text{hope}} = 5.70; SD = 1.55$ ) than those in pride ( $M_{\text{pride}} = 3.62; SD = 1.52, p < .001$ ) and neutral conditions ( $M_{\text{neutral}} = 3.55; SD = 1.32, p < .001$ ). There were no differences in self-reported temporal focus for those in the neutral condition compared to pride condition ( $M_{\text{neutral}} = 3.55$  vs.  $M_{\text{pride}} = 3.62, p = 1$ ). These results provided evidences that the emotional state of hope leads individuals to construe events with a greater future-oriented temporal focus, when compared to pride and neutral conditions. Therefore, this pre-test indicates that the writing task successfully induced hope, pride and neutral emotional states, which in turn triggered the expected temporal focus.



## Study 1

The first goal of this study is to demonstrate that a hopeful mind-set (i.e., incidental hope), compared to a proud mind-set (i.e., incidental pride) and a baseline condition (i.e., neutral) shows higher self-risk perception (H1) when exposed to a health-care warning message. The second goal is to show that incidental hope, compared to incidental pride and neutral condition, demonstrates higher compliance with the warning appeal (H2a) mediated by self-risk perception (H2b).

### PARTICIPANTS AND DESIGN

A total of one hundred and five undergraduate students (mean age: 21.3 years, SD: 3.5; 56% male) completed the lab study in exchange for course credit. The experiment employed a single factor (hope vs. pride vs. neutral) between-subjects design. The students were randomly assigned to one of the three emotional state conditions.

### PROCEDURE

As a cover story, participants were told that they were taking part in two unrelated studies: an emotions experiment and a marketing survey on health (Agrawal, Menon, & Aaker, 2007). We induced the relevant emotional state using the writing task from the previous pre-test (see appendix A for the full script of the writing tasks instructions).

Right after the writing task, participants indicated the extent to which they were experiencing each of four emotion words (happiness, hope, pride, sadness), which were randomly ordered, on a 7-point scale (1 = I do not feel the emotion at all, and 7 = I really feel the emotion), and one item on a 7-point scale to assess the emotion's temporal focus (1 = in the past, and 7 = in the future).

Next, participants took part in a survey about health-care advertising campaign (the second study supposedly unrelated) that contained a warning ad about Sexually Transmitted Diseases (STDs). We selected STDs as the health hazard because undergraduate students are among the target groups in this type of advertising. According to data from the Brazilian Health Ministry, the detection rate of HIV, one of the most serious STDs, in the 20-24 age

group, increased from 16.2 cases per 100,000 inhabitants, in 2005, to 33.1 cases per 100,000 inhabitants, in 2015. As such, STDs cases have increased greatly in Brazil, especially among young people, who seem not to be afraid of diseases and may be less likely to protect themselves (Governo do Brasil. Ministério da Saúde, 2018). Therefore, STDs is a relevant health-care warning message for this target audience (i.e., undergraduate students).

Participants were told that the Brazilian Health Ministry was designing a health-care warning campaign target to undergraduate students like them. Participants read in the ad title: *Condom serves to more than preventing unwanted pregnancy. Have you thought about it?* The ad information about the disease was: *In recent years, Brazil has reported an increase in the spread of sexually transmitted diseases (STDs), due to a decrease in the use of condoms. According to data from the Health Ministry, only 56.6% of young people use condoms. It is very important to remember that, in addition to avoiding an unplanned pregnancy, the use of condom prevents the spread of STDs such as syphilis, chlamydia, gonorrhea and HIV.* The ad appeal was: *Condoms are one of the safest methods for STDs prevention. Prevent yourself. Use condom.* See appendix B to visualize the warning ad.

After reading the ad, participants rated their self-risk perception about contracting an SDT in unprotected sex: *In your opinion, what are the chances (0 to 100% probability) that you will get an STD during sex without using a condom?* Then the participants rated their compliance with the health-care ad appeal by reporting their attitude intention on a 101-point probability scale (Agrawal, Menon, & Aaker, 2007): *What are the chances (0 to 100% probability) that you will use a condom the next time you have sex?*

Afterwards, as in Agrawal, Menon and Aaker (2007), participants evaluated the ad content rating four items (*Informative; Credible; Useful; Efficient*), on a 7-point scale (1 = not at all, and 7 = extremely).

Finally, participants were asked to provide their demographic information. At the end of the session, students were thanked for their participation and dismissed.

## RESULTS

### ***Manipulation Checks***

*Emotions.* The results of a one-way ANOVA on the emotion-manipulation check shows that self-reported hope indicates a significant difference between the three emotional state

conditions ( $F(2, 102) = 87.41, p < .001$ ), as well as self-reported pride ( $F(2, 102) = 47.64, p < .001$ ). Planned contrasts indicated that self-reported hope in the hope condition ( $M_{\text{hope}} = 6.06; SD = 1.03$ ) was greater than for pride ( $M_{\text{pride}} = 4.97; SD = 1.60, p < .005$ ) and neutral conditions ( $M_{\text{neutral}} = 2.06; SD = 1.23, p < .001$ ). The feeling of pride was higher for those in the pride condition ( $M_{\text{pride}} = 6.09; SD = 1.25$ ), compared to hope ( $M_{\text{hope}} = 4.74; SD = 1.80, p < .005$ ) and neutral conditions ( $M_{\text{neutral}} = 2.63; SD = 1.38, p < .001$ ). In addition, there was no negative mood effects in our main comparison since there was no statistical difference on sadness score between the two positive emotion conditions ( $M_{\text{hope}} = 2.46; SD = 1.65$ ; vs.  $M_{\text{pride}} = 1.91; SD = 1.04, p = .235$ ), and there was no statistical difference between the two positive emotional state conditions and the neutral condition ( $M_{\text{neutral}} = 2.17; SD = 1.38, p = 1$ ). Also, there was no statistical difference on happiness score between the two positive emotion conditions ( $M_{\text{hope}} = 5.17; SD = 1.67$ ; vs.  $M_{\text{pride}} = 5.71; SD = 1.20, p = .323$ ), but there was statistical difference between the two positive emotional state conditions and the neutral condition ( $M_{\text{neutral}} = 2.20; SD = 1.28, p < .001$ ). These results indicate that the writing task successfully induced the intended emotional states of hope, pride and neutral.

*Temporal Focus.* The one-way ANOVA results show that the self-reported temporal focus shows a significant difference between the three emotional state conditions ( $F(2, 102) = 7.44, p < .001$ ). Participants in the hopeful writing task condition reported a greater future-focus on their essays ( $M_{\text{hope}} = 5.06; SD = 1.53$ ) than participants in pride ( $M_{\text{pride}} = 3.91; SD = 1.67, p < .01$ ) and neutral conditions ( $M_{\text{neutral}} = 3.71; SD = 1.51, p < .005$ ). As expected, these results indicate that the intended emotions have triggered the predicted temporal focus. That is, the emotional state of hope triggered a greater future temporal focus than pride and neutral conditions.

### ***Hypotheses Tests***

*Self-Risk Perception.* The results of a one-way ANOVA on the dependent variables indicates that self-risk perception shows a significant difference between the three emotional state conditions ( $F(2, 102) = 4.168, p < .05$ ), as shown in Figure 1.

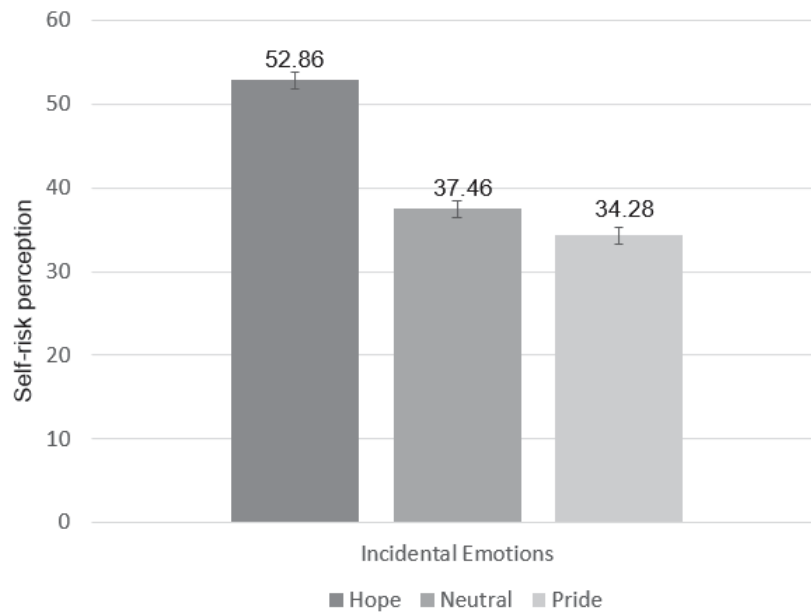


Figure 1: Self-risk perception of hope vs. neutral vs. pride conditions (study 1)

Figure 1 shows the self-risk perception score comparison for the three emotional state conditions. Planned contrasts indicated that self-risk perception in the hope condition ( $M_{\text{hope}} = 52.86$ ;  $SD = 32.19$ ) was greater than for pride condition ( $M_{\text{pride}} = 34.28$ ;  $SD = 26.70$ ,  $p < .05$ ) and, although the score of hopeful condition is greater than the score of neutral condition, this difference did not reach statistical significance ( $M_{\text{neutral}} = 37.46$ ;  $SD = 27.14$ ,  $p = .08$ ). There was no statistical difference between pride and neutral conditions ( $M_{\text{pride}} = 34.28$  vs.  $M_{\text{neutral}} = 37.46$ ,  $p = 1$ ). These results corroborate H1, which proposes that incidental hope, compared to pride, shows higher self-risk perception when exposed to a health-care warning message.

*Compliance Intention.* The results of one-way ANOVA also indicated that self-reported compliance intention indicates a significant difference between the three emotional state conditions ( $F(2, 102) = 3.531$ ,  $p < .05$ ), as shown in Figure 2.

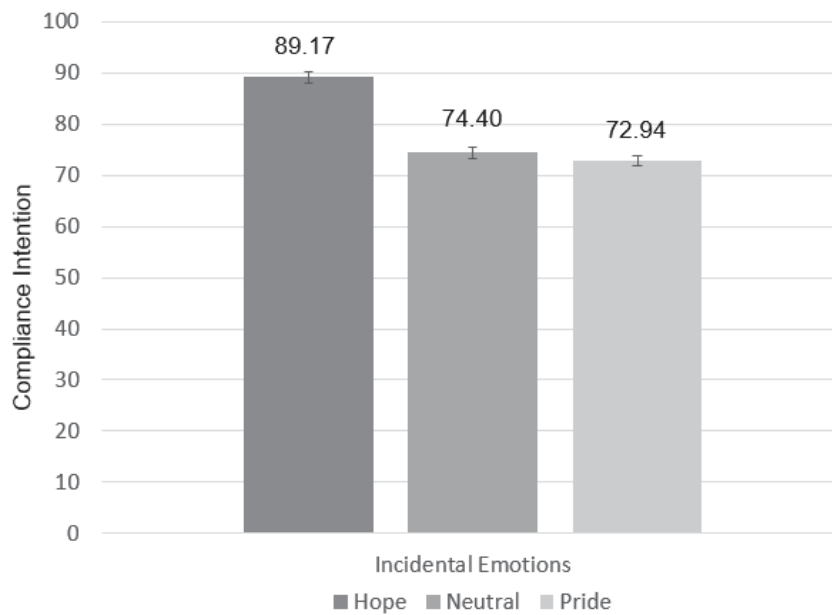
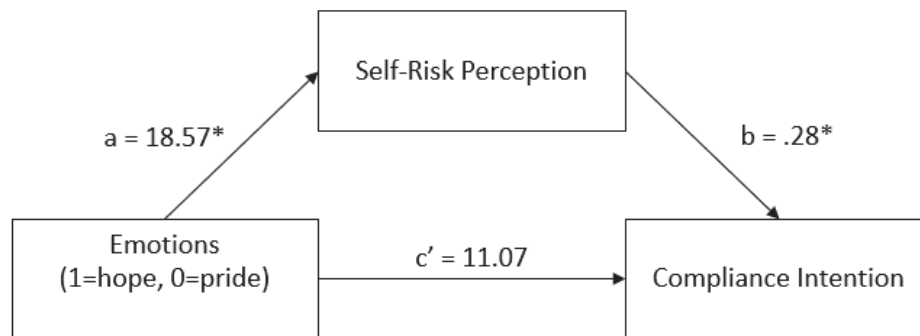


Figure 2: Compliance intention of hope vs. neutral vs. pride condition (study 1)

Figure 2 shows the compliance intention score comparison for the three emotional state conditions. Planned contrasts indicated that compliance intention was higher for those in the hope condition ( $M_{\text{hope}} = 89.17$ ;  $SD = 25.13$ ) compared to pride ( $M_{\text{pride}} = 72.94$ ;  $SD = 32.31$ ,  $p < .05$ ) and neutral conditions ( $M_{\text{neutral}} = 74.40$ ;  $SD = 26.85$ ,  $p < .05$ ). There was no statistical difference between pride and neutral conditions ( $M_{\text{pride}} = 72.94$  vs.  $M_{\text{neutral}} = 74.40$ ,  $p = .977$ ). These results corroborate H2a, which proposes that incidental hope, compared to pride, shows higher compliance with the health-care warning appeal.

*Mediation Analysis.* Following Preacher and Hayes (2004), the mediation analysis was tested through bootstrapping. A 95% confidence interval (CI) of the parameter estimates was obtained by running the resampling 10,000 times. The incidental emotion, our independent variable, was coded as 1 = hope and 0 = pride, and we run the pairwise emotions comparison. To test several paths of mediation, we used model 4 of Hayes (2013) process macro. The mediation analysis was conducted to evaluate the indirect effect of emotions upon compliance intention through self-risk perception. The results indicate that self-risk perception mediation was significant for the pairwise hope vs. pride ( $Coef = 5.15$ ;  $CI = .368$  to  $12.103$ ), as shown in Figure 3.



NOTE. – \*  $p < .05$ .

Figure 3: The mediating role of self-risk perception between emotions (hope vs. pride) and compliance intention (study 1)

The Figure 3 shows a positive impact of hope on self-risk perception ( $Coef = 18.57$ ;  $CI = 4.463$  to  $32.679$ ). Self-risk perception also had a positive impact on consumers' compliance intention ( $Coef = .28$ ;  $CI = .048$  to  $.506$ ). The expected indirect effect of self-risk perception between emotions and compliance intention was statistically significant (indirect effect =  $5.15$ ,  $95\% CI = .368$  to  $12.103$ ). There was no direct effect of emotions on compliance intention (direct effect =  $11.07$ ;  $CI = -2.929$  to  $25.076$ ) and no other result has emerged. We additionally run the pairwise comparison between hope vs. neutral ( $Coef = 5.131$ ;  $CI = .310$  to  $12.038$ ) that was also significant (see appendix C for more details).

These results corroborate H2b, which proposes that incidental hope, compared to pride, demonstrates higher compliance to the health-care warning appeal mediated by self-risk perception. It also demonstrates that the effect of the future-oriented emotion on compliance is driven by the risk perception. The main effect disappears with the risk perception.

*Ad Evaluation.* An ad evaluation index was created by averaging the four items ( $\alpha = .72$ ). We conducted a one-way ANOVA with the ad evaluation as the dependent variable to rule out alternative explanation to our hypothetical framework. The results indicate that there was no statistical difference on ad evaluation between the three emotional state conditions ( $M_{hope} = 5.75$ ;  $SD = .86$ ; vs.  $M_{pride} = 5.49$ ;  $SD = 1.13$ ; vs.  $M_{neutral} = 5.85$ ) ( $F(2, 102) = 1.354$ ,  $p = .263$ ).

Therefore, emotions have no incidental effect on ad evaluation, and this is not the mechanism by which the proposed emotions impact the compliance with health-care warning messages.

## DISCUSSION

The results of study 1 provide initial support for hypotheses H1 and H2. Incidental hope, compared to incidental pride, demonstrates greater self-risk perception when exposed to the STDs warning message, supporting H1. Similar effect is observed for the compliance intention with the health-care warning appeal, supporting H2a. The study also shows first evidence that self-risk perception completely mediates the relationship between emotions and compliance intention. That is, incidental hope shows higher self-risk perception when exposed to the STDs warning message, which in turn increases compliance intention with the preventive behavior requested in the STDs ad appeal, supporting H2b.

Although these results support our predictions, we need to show further evidence of these effects in a different health-care domain. These issues are addressed in study 2.

### **Study 2**

Study 2 attempts to replicate our previous results in a different health-care domain (Hepatitis) with a more heterogeneous audience than study 1 (using Amazon Mechanical Turk).

## PARTICIPANTS AND DESIGN

A total of one hundred and eight participants (mean age: 38.1 years, SD: 12; 59% female) completed the M-Turk study in exchange for payment. Twelve participants failed the attention check and were eliminated from further analysis, leaving a final sample of ninety-six respondents. The experiment employed a single factor (hope vs. pride vs. neutral), between-subjects design. The participants were randomly assigned to one of the three emotional state conditions.

## PROCEDURE

The procedure followed was similar to that used in experiment 1, except for the following changes. Participants took part in a survey about health-care advertising campaign (the second study supposedly unrelated) that contained a warning ad about Hepatitis disease. We selected Hepatitis as the health hazard because it is a disease with a high infection rate and affects people of all ages. Thus, this experiment covers a larger audience because it is not restricted to the young audience, as the lab study with students employed in the previous experiment. Therefore, Hepatitis disease is a relevant health-care warning message for M-Turk procedure employed in this experiment.

Participants were told that the American Liver Foundation was designing an advertising campaign targeted at people like them. They were then invited to collaborate with the campaign by evaluating the ad and answering some questions. Participants read in the ad title: *Five million Americans have hepatitis. Do you?* The ad information about the disease was: *The hepatitis virus is more common and can be more infectious than the Aids virus. Yellowing of the skin or eyes can signal hepatitis, although most people have no recognizable signs or symptoms. Untreated, hepatitis can lead to cirrhosis (scarring) of the liver, liver cancer and liver failure. You are at high risk for hepatitis if you have been exposed to infected blood or body fluids through unprotected sex, tattooing and body piercing. Even kissing, sharing razors or toothbrushes, and getting a manicure puts you at risk. Your doctor can do specific tests to diagnoses hepatitis. Get tested, in many cases, hepatitis can be treated.* The ad appeal was: *Get tested.* See appendix B for the warning ads details.

After reading the ad, participants indicated their self-risk perception about contracting hepatitis, on a 7-point scale (1 = not at all likely, and 7 = very likely): *Please, point out what is the likelihood of you contracting hepatitis.* Then participants indicated their compliance intention to the health-care ad appeal, on a 7-point scale (1 = will definitely not get tested, and 7 = will definitely get tested): *Please, point out what is the likelihood of you getting tested for hepatitis* (based on Agrawal, Menon, & Aaker, 2007; Chandran & Menon, 2004).

We included Google's reCAPTCHA system which was designed to establish that a computer user is human (and not a robot). Thus, participants were required to click on "I'm not a robot" before completing the study. In addition, based on Reich, Beck, and Price (2018), we used two attention checks after dependent variable measures, on a 7-point scale (1 =



totally disagree, and 7 = totally agree): *In the following question, please select the circle exactly in the middle of the scale; In the following question, please select the circle closest to “Totally agree”.* They were also asked to explain in one short sentence about what kind of situation they were asked to write in the first activity, and to recall any information about the health-care ad that they were exposed in the second activity.

Finally, participants were asked to provide their demographic information. At the end of the session, participants were thanked for their participation and dismissed.

## RESULTS

### *Manipulation Checks*

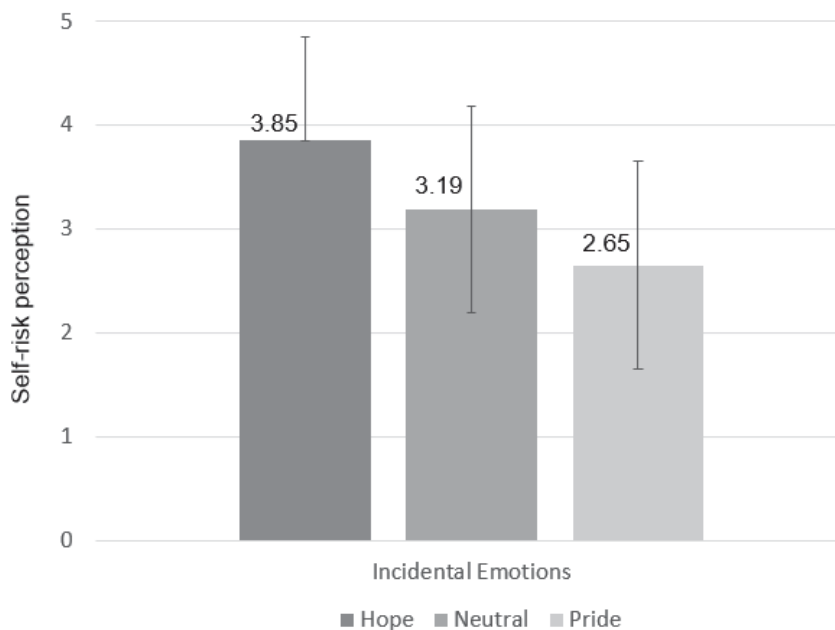
*Emotions.* The results of a one-way ANOVA on the emotion-manipulation check shows that self-reported hope presents a significant difference between the three emotional state conditions ( $F(2, 93) = 34.31, p < .001$ ), as well as self-reported pride ( $F(2, 93) = 29.58, p < .001$ ). Planned contrasts indicated that self-reported hope in the hope condition ( $M_{\text{hope}} = 6.52; SD = .712$ ) was greater than for pride ( $M_{\text{pride}} = 5.39; SD = 1.69, p < .005$ ) and neutral conditions ( $M_{\text{neutral}} = 3.34; SD = 2.01, p < .001$ ). The feeling of pride was higher for those in the pride condition ( $M_{\text{pride}} = 6.32; SD = .91$ ), compared to hope ( $M_{\text{hope}} = 5.24; SD = 1.71, p < .01$ ) and neutral conditions ( $M_{\text{neutral}} = 3.34; SD = 1.86, p < .001$ ). In addition, there were no negative mood effects of sadness between the two positive emotion conditions ( $M_{\text{hope}} = 2.55; SD = 1.90$ ; vs.  $M_{\text{pride}} = 1.87; SD = 1.36, p = .234$ ), and there was no statistical difference between the positive emotional state conditions and the neutral condition ( $M_{\text{neutral}} = 1.88; SD = 1.41$  vs.  $M_{\text{hope}} = 2.55; SD = 1.90, p = .247$ , neither vs.  $M_{\text{pride}} = 1.87; SD = 1.36, p = 1$ ). Also, there was no statistical difference on happiness score between the two positive emotion conditions ( $M_{\text{hope}} = 5.76; SD = 1.60$ ; vs.  $M_{\text{pride}} = 6.03; SD = .836, p = .663$ ), but there was statistical difference between the positive emotional state conditions and the neutral condition ( $M_{\text{neutral}} = 3.94; SD = 1.86, p's < .001$ ). These results indicate that the writing task successfully induced the intended emotional states of hope, pride and neutral.

*Temporal Focus.* The one-way ANOVA results show that the self-reported essays' temporal focus shows a significant difference between the three emotional state conditions ( $F(2, 93) = 26.38, p < .001$ ). Participants in the hopeful writing task condition reported a greater future-

focus on their essays ( $M_{\text{hope}} = 5.39$ ;  $SD = 1.69$ ) than participants in pride condition ( $M_{\text{pride}} = 2.52$ ;  $SD = 1.59$ ,  $p < .001$ ). Although the score of hopeful condition is greater than the score of the neutral condition, this difference did not reach statistical significance ( $M_{\text{neutral}} = 4.47$ ;  $SD = 1.54$ ,  $p = .069$ ). As expected, these results indicate that the intended emotions have triggered the predicted temporal focus. That is, the emotional state of hope triggered a greater future temporal focus than pride condition, the comparison of interest in our hypotheses.

### *Hypotheses Tests*

*Self-Risk Perception.* The results of a one-way ANOVA on self-risk perception presents a significant difference between the three emotional state conditions ( $F(2, 93) = 4.582$ ,  $p < .05$ ), as shown in Figure 4.



*Figure 4: Self-risk perception of hope vs. neutral vs. pride conditions (study 2)*

Figure 4 shows the self-risk perception score comparison for the three emotional state conditions. Planned contrasts indicated that self-risk perception in the hope condition ( $M_{\text{hope}} = 3.85$ ;  $SD = 1.84$ ) was greater than for pride condition ( $M_{\text{pride}} = 2.65$ ;  $SD = 1.25$ ,  $p < .01$ ), but there was no statistical difference between hope and neutral conditions ( $M_{\text{neutral}} = 3.19$ ;  $SD = 1.61$ ,  $p = .294$ ). Also, there was no statistical difference between pride and neutral

conditions ( $M_{\text{pride}} = 2.65$  vs.  $M_{\text{neutral}} = 3.19$ ,  $p = .541$ ). These results corroborate H1, which proposes that incidental hope, compared to pride, demonstrates higher self-risk perception when exposed to a health-care warning message.

*Compliance Intention.* The results of one-way ANOVA also indicated a significant difference between the three emotional state conditions for compliance intention ( $F(2, 93) = 4.364$ ,  $p < .05$ ), as shown in Figure 5.

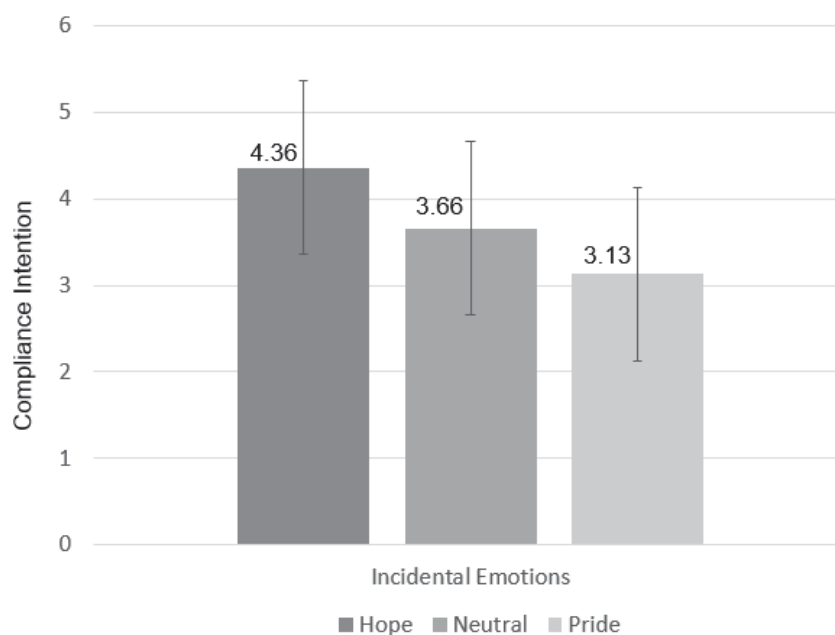
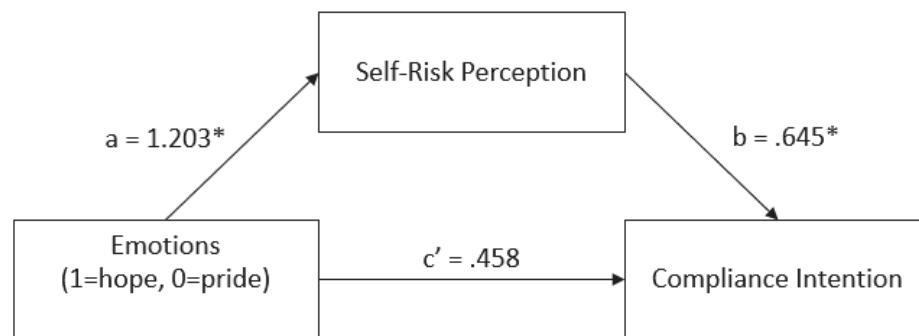


Figure 5: Compliance intention of hope vs. neutral vs. pride conditions (study 2)

Figure 5 shows the compliance intention score comparison for the three emotional state conditions. Planned contrasts indicated that the compliance intention was higher for those in the hope condition ( $M_{\text{hope}} = 4.36$ ;  $SD = 1.73$ ), compared to those in the pride ( $M_{\text{pride}} = 3.13$ ;  $SD = 1.61$ ,  $p < .05$ ), but there was no statistical difference to those on neutral condition ( $M_{\text{neutral}} = 3.66$ ;  $SD = 1.69$ ,  $p = .279$ ). There was no statistical difference between pride and neutral conditions ( $M_{\text{pride}} = 3.13$  vs.  $M_{\text{neutral}} = 3.66$ ,  $p = .648$ ). These results corroborate H2a, which proposes that incidental hope, compared to pride, shows higher compliance with the health-care warning appeal.

*Mediation Analysis.* Following Preacher and Hayes (2004), the mediation analysis was tested through bootstrapping. A 95% confidence interval (CI) of the parameter estimates was

obtained by running the resampling 10,000 times. The incidental emotion, our independent variable, was coded as 1 = hope and 0 = pride. To test several paths of mediation, we used model 4 of Hayes (2013) process macro. The mediation analysis was conducted to evaluate the indirect effect of emotions upon compliance intention through self-risk perception. The results indicate that self-risk perception mediation was significant for the pairwise comparison between hope vs. pride ( $Coef = .776$ ;  $CI = .289$  to  $1.321$ ), as shown in the Figure 6.



NOTE. – \*  $p < .05$ .

Figure 6: The mediating role of self-risk perception between emotions (hope vs. pride) and compliance intention (study 2)

The Figure 6 shows a positive impact of hope on self-risk perception ( $Coef = 1.203$ ;  $CI = .4119$  to  $1.994$ ). Self-risk perception also had a positive impact on consumers' compliance intention ( $Coef = .645$ ;  $CI = .431$  to  $.859$ ). The expected indirect effect of self-risk perception between emotions and compliance intention was statistically significant (indirect effect =  $7.76$ ,  $95\% CI = .289$  to  $1.321$ ). There was no direct effect of emotions on compliance intention (direct effect =  $.458$ ;  $CI = -.256$  to  $1.172$ ) and no other result has emerged. We additionally run the pairwise comparison between hope vs. neutral ( $Coef = .3421$ ;  $CI = -.089$  to  $.836$ ) that was not statistically significant, and also no direct effect was found.

These results corroborate H2b, which proposes that incidental hope, compared to pride, demonstrates higher compliance with the health-care warning appeal, mediated by self-risk perception.

## DISCUSSION

The results of study 2 successfully replicated those obtained in study 1 with a different health-care domain (hepatitis) and with a more heterogeneous audience (MTurk respondents). The compliance of participants was positively affected by feelings of hope, compared to pride. The results provide further support for the mediating role of risk perception.

Although we found consistent evidence that future-oriented emotion (i.e., hope) increases the risk perception and as a consequence the compliance with warning messages, compared to past-oriented emotion (i.e., pride), past research on temporal focus and risk-taking (Sagristano, Trope & Liberman, 2002; Chandran & Menon, 2004; Lerner et al., 2015) shows exactly the opposite pattern. When no emotion is explicitly associated with temporal focus, individuals show higher risk perception in the recent past focus, compared to the future focus. We propose that the cognitive appraisals associated with hope and pride change how consumers process the information about risk. We test these predictions in study 3.

### Study 3

In study 3 we manipulate temporal focus eliciting future vs. past perspective with the respective presence and absence of emotions to test our hypotheses H3. We expect to replicate the results of studies 1 and 2 when temporal focus is associated to the respective emotion (i.e., hope vs. pride conditions). In the hope condition, which is a future-oriented emotion, we expect that risk perception and compliance will be higher compared to pride condition, which is a past-oriented emotion. In contrast, we expect the opposite effect to be found when temporal focus is not associated to the respective emotion (i.e., future vs. past conditions). In the future condition with no specific emotion associated we expect that risk perception and compliance will be lower compared to the past temporal focus condition.

## PARTICIPANTS AND DESIGN

A total of one hundred and twenty-nine undergraduate students (mean age: 21.8 years, SD: 3.42; 50% male) completed the lab study in exchange for course credit. Seventeen

participants failed the attention check and were eliminated from further analysis, leaving a final sample of one hundred and thirteen undergraduate students. The experiment employed a 2 (temporal focus: future vs. past) x 2 (emotion: present vs. absent), between-subjects design. Respondents were randomly assigned to one of the four conditions: future emotion-oriented (i.e., hope condition) vs. past emotion-oriented (i.e., pride condition) vs. future no emotion-oriented (i.e., future condition) vs. past no emotion-oriented (i.e., past condition).

## PROCEDURE

The procedure was similar to that used in the previous experiments, except for the temporal focus manipulation, which was induced using the writing task procedure (Lerner & Keltner, 2001; Tracy & Robins, 2007; Winterich & Haws, 2011; Huang et al., 2014), only changing the presence and absence of the emotion-oriented temporal focus. For instance, in the future-oriented emotion condition, participants were asked to “travel in time” and think of something they were hopeful that would happen in their life in about a year, whereas in the future with no-emotion oriented condition, they were simply asked to think about how their life will be in about a year. Appendix A shows the full script of the writing tasks instructions.

Right after the writing task (Winterich and Haws, 2011), participants indicated the extent to which they were experiencing each of four emotion words (happiness, hope, pride, sadness), which were randomly ordered, on a 7-point scale (1 = I do not feel the emotion at all, and 7 = I really feel the emotion), and one item on a 7-point scale to assess the essay’s temporal focus (1 = in the past, and 7 = in the future).

Next, participants took part in a supposedly unrelated survey about STDs advertising campaign, as employed in study 1, and asked to collaborate by evaluating the ad. After reading the ad, participants rated their self-risk perception about contracting an STD in unprotected sex: *In your opinion, what are the chances (0 to 100% probability) that you will get an STD during sex without using a condom?* Then the participants rated their compliance with the health-care ad appeal by reporting their attitude intention on a 101-point probability scale (Agrawal, Menon, & Aaker, 2007): *What are the chances (0 to 100% probability) that you will use a condom the next time you have sex?*

We used two attention checks, based on Reich, Beck, and Price (2018), after dependent variable measures, on a 7-point scale (1 = totally disagree, and 7 = totally agree): *In the following question, please select the circle exactly in the middle of the scale; In the*

following question, please select the circle closest to “Totally agree”. In addition, participants were also asked to explain in one short sentence about what kind of situation they were asked to write in the first activity, and to recall any information about the health-care ad that they were exposed in the second activity.

Finally, participants were asked to provide their demographic information. At the end of the session, students were thanked for their participation and dismissed.

## RESULTS

### *Manipulation Checks*

*Emotions.* A two-way between-subjects ANOVA of temporal focus and emotion presence shows only a main effect of emotion presence on self-reported hope ( $F(1,112) = 5.525, p < .05; \eta_p^2 = .048$ ) and self-reported pride ( $F(1,112) = 6.421, p < .05; \eta_p^2 = .056$ ). Within emotion present condition participants show significant difference in their self-reported hope ( $M_{\text{future-hope}} = 6.40; SD = .814$  vs.  $M_{\text{past-pride}} = 5.36; SD = 1.54$ ) ( $F(1, 109) = 7.958, p < .01; \eta_p^2 = .068$ ) and self-reported pride ( $M_{\text{past-pride}} = 5.96; SD = 1.62$  vs.  $M_{\text{future-hope}} = 5.07; SD = 2.01$ ) ( $F(1, 109) = 3.08, p < .05; \eta_p^2 = .028$ ). Within future temporal focus condition participants show significant difference in their self-reported hope ( $M_{\text{future-hope}} = 6.40; SD = .814$  vs.  $M_{\text{future}} = 5.33; SD = 1.710$ ) ( $F(1, 109) = 8.169, p < .005, \eta_p^2 = .070$ ) and self-reported pride ( $M_{\text{past-pride}} = 5.96; SD = 1.62$  vs.  $M_{\text{past}} = 4.25; SD = 2.03$ ) ( $F(1, 109) = 11.852, p < .001, \eta_p^2 = .098$ ). Any other effects were observed ( $F_s < 1$ ).

*Temporal Focus.* A two-way between-subjects ANOVA of temporal focus and emotion presence on self-reported temporal focus shows only a main effect of temporal focus ( $F(1,112) = 3.461, p < .05; \eta_p^2 = .031$ ). Within emotion absent condition, those in the future condition showed a higher focus in the future ( $M_{\text{future}} = 5.48; SD = 1.36$ ) compared to those in the past condition ( $M_{\text{past}} = 3.86; SD = 1.88$ ) ( $F(1, 109) = 16.014, p < .001; \eta_p^2 = .128$ ). There was no difference among those in the future temporal focus condition ( $M_{\text{future}} = 5.48; SD = 1.36$  vs.  $M_{\text{future-hope}} = 6.00; SD = .910$ , ( $F(1,109) = 1.687, p = .197$ ) and among those in the past temporal focus condition ( $M_{\text{past}} = 3.86; SD = 1.88$  vs.  $M_{\text{past-pride}} = 4.39; SD = 1.707$ ,  $p = .197$ , ( $F(1,109) = 1.774, p = .186$ ). Any other effects were observed ( $F_s < 1$ ).

### *Hypotheses Tests*

*Self-Risk Perception.* The results of a two-way ANOVA on self-risk perception indicate no main effect of emotion presence ( $F(1, 109) = .033, p = .856$ ), or temporal focus on self-risk perception ( $F(1, 109) = .972, p = .326$ ). However, the expected interaction effect was significant ( $F(1, 109) = 9.359, p < .005, \eta_p^2 = .079$ ), as shown in Figure 7.

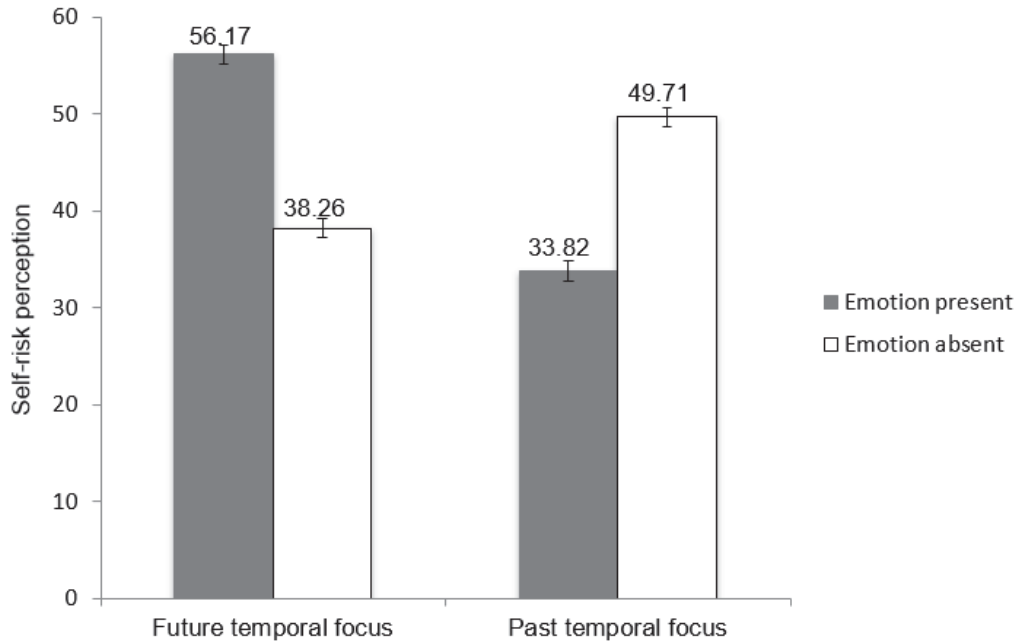


Figure 7: Emotion presence and temporal focus on self-risk perception (study 3)

Within the emotion present condition, self-risk perception was higher for those in the “future temporal focus” condition ( $M_{\text{future-hope}} = 56.17; SD = 5.35$ ) than for those in the “past temporal focus” condition ( $M_{\text{past-pride}} = 33.82; SD = 5.55$ ) ( $F(1, 109) = 8.400, p < .005, \eta_p^2 = .072$ ). Within the emotion absent condition, no difference was observed for self-risk perception between “future temporal focus” ( $M_{\text{future}} = 38.26; SD = 28.74$ ) and “past temporal focus” conditions ( $M_{\text{past}} = 49.71; SD = 29.79$ ) ( $F(1, 109) = 2.095, p = .151$ ).

Within the “future temporal focus” condition, the self-risk perception was higher for those in the “emotion present” condition ( $M_{\text{future-hope}} = 56.17; SD = 5.35$ ) than for those in the “emotion absent” condition ( $M_{\text{future}} = 38.26; SD = 28.74; SD = 29.79$ ) ( $F(1, 109) = 5.294, p < .05, \eta_p^2 = .046$ ). Within the “past temporal focus” condition, the self-risk perception was lower for those in the “emotion present” condition ( $M_{\text{past-pride}} = 33.82; SD = 5.55$ ) than for those in the “emotion absent” condition ( $M_{\text{past}} = 49.71; SD = 29.79$ ) ( $F(1, 109) = 4.108, p < .05, \eta_p^2 = .036$ ).



These results replicate our previous results, where incidental hope, compared to pride, lead consumers to present greater self-risk perception when exposed to a health-care warning message. In addition to corroborating hypothesis H1, it adds evidence that this effect only occurs when temporal focus is associated with the emotion-temporal focus. We also found evidence that when individuals are in the past temporal focus, the presence of pride reduces the risk perception compared to the no emotion related condition.

*Compliance Intention.* Similar analyses were performed for compliance intention. The results indicate that there was no main effect of emotion condition ( $F(1, 109) = .384, p = .537$ ), or temporal focus condition on compliance intention ( $F(1, 109) = .512, p = .476$ ). However, the expected interaction was significant ( $F(1, 109) = 13.364, p < .001, \eta_p^2 = .109$ ), as shown in Figure 8.

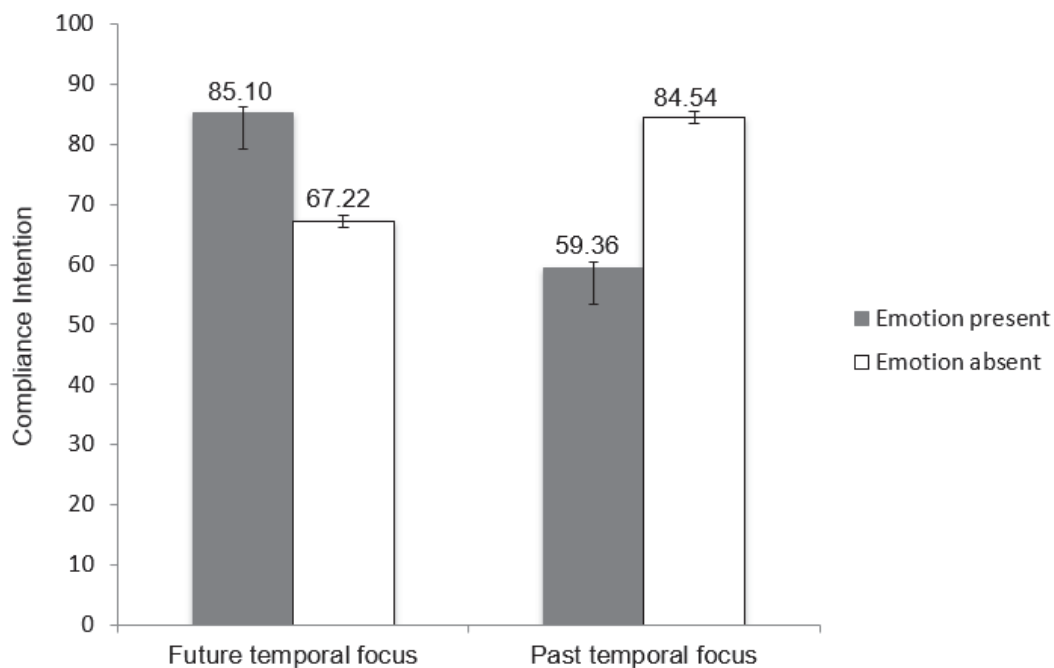


Figure 8: Emotion presence and temporal focus on compliance intention (study 3)

Within the “emotion present” condition, compliance intention was higher for those in the “future temporal focus” ( $M_{\text{future-hope}} = 85.10$ ;  $SD = 27.29$ ) than for those in the “past temporal focus” condition ( $M_{\text{past-pride}} = 59.36$ ;  $SD = 37.42$ ) ( $F(1, 109) = 9.811, p < .005, \eta_p^2 = .083$ ). For those in the “emotion absent” condition, compliance intention was lower for those

in the “future temporal focus” condition ( $M_{\text{future}} = 67.22$ ;  $SD = 36.61$ ) than for those in the “past temporal focus” condition ( $M_{\text{past}} = 84.54$ ;  $SD = 21.40$ ) ( $F(1, 109) = 4.212$ ,  $p < .05$ ,  $\eta_p^2 = .037$ ).

Within the “future temporal focus” condition, compliance intention was higher for those in the “emotion present” condition ( $M_{\text{future-hope}} = 85.10$ ;  $SD = 27.29$ ) than for those in the “emotion absent” condition ( $M_{\text{future}} = 67.22$ ;  $SD = 36.61$ ) ( $F(1, 109) = 4.643$ ,  $p < .05$ ,  $\eta_p^2 = .041$ ). For those in the “past temporal focus” condition, the compliance intention was lower for those in the “emotion present” condition ( $M_{\text{past-pride}} = 59.36$ ;  $SD = 37.42$ ) than for those in the “emotion absent” condition ( $M_{\text{past}} = 84.54$ ;  $SD = 21.40$ ) ( $F(1, 109) = 9.072$ ,  $p < .005$ ,  $\eta_p^2 = .077$ ).

These findings also replicate our previous results, where incidental hope, compared to pride, shows higher compliance intention when exposed to a health-care warning message, thus, confirming H2a. It also corroborates our hypothesis H3 by showing evidence that this effect is contingent to the emotion-focused temporal focus. That is, these results show that the incidental effect of temporal focus on individuals’ risk judgment outcomes promotes and opposite effect when associated with specific emotion: when the future temporal focus is associated with hope feeling the individuals present higher self-risk perception and compliance intention compared to past temporal focus associated with pride feeling, whereas future temporal focus not associated with emotion promote lower self-risk perception and compliance intention when compared to past temporal focus not associated with emotions.

## DISCUSSION

Overall, study 3 provides the following contributions. First, study 3 replicates the previous findings of studies 1 and 2. Second, it provides initial evidence that the impact of temporal focus on risk perception and compliance with warning messages are contingent to the emotion-focused temporal orientation, corroborating H3. When individuals are future oriented with hope feeling, the risk perception and compliance are higher compared to the past-oriented with pride feeling. The opposite is observed for the temporal focus not associated with specific emotions. In study 4, the role of message frame is explored.

## Study 4

Even though past research has associated pride with higher risk-taking behavior (Tracy & Robins, 2004; Wilcox, Kramer, & Sen, 2010; So et al., 2015; Weidman, Tracy, & Elliot, 2016), pride as a consequence of goal attainment also has a positive effect on consumers' preferences for gain message frames (Mantovani, Andrade, & Prado, 2018). Also, hope is associated with lower sense of control and higher uncertainty, which is related to possible losses and risk-aversion tendencies. Therefore, an open question is whether gain versus loss message frames (e.g., Block & Keller, 1995; Rothman, & Salovey, 1997; Mogilner, Aaker, & Pennington, 2007; Cho & Sands, 2011) would contribute to the previously observed effects. We expect that warning messages framed in gain perspective may increase the risk perception and compliance of those in the pride focused orientation, whereas those in the hope focused orientation would demonstrate a higher preference for loss framed warning messages (H4).

We focus on warning messages that describe the consequences associated with either adopting (gain frame) or not adopting (loss frame) the health-care preventive behavior. We test our prediction with two different warning messages, skin cancer (Study 4A) and hepatitis (Study 4B), with a between-subjects design.

Additionally, we improved the manipulation check of hope and pride by including specific statements rather than direct words. The manipulation check for temporal focus was replaced by two separated sentences, one for the future and another for the past orientation. We also included a measure of goal attainment, which should contrast between hope and pride. The measures of self-risk perception and compliance intention were both improved, including two items for each construct, rather than a single item as employed in our previous studies.

## PARTICIPANTS AND DESIGN

Study is a 2 (incidental emotion: hope vs. pride) x 2 (message frame: loss vs. gain), between-subjects design. The two warning messages advertising were tested in two experiments: study 4A tested the skin cancer warning message, and study 4B tested the hepatitis warning message.

Participants were randomly assigned to one of eight conditions and were recruited on M-Turk in exchange for payment. For the skin cancer advertising (study 4A), a total of one hundred and ninety-one participants (mean age: 34.4 years, SD: 10.8; 51% male) completed the study. Nineteen participants failed the attention check and were eliminated from further analysis, leaving a final sample of one hundred and seventy-two respondents. One hundred and ninety-one participants were exposed to the hepatitis warning message advertising (study 4B) (mean age: 38.6 years, SD: 12.3; 52% female). Ten participants failed the attention check and were eliminated from further analysis, leaving a final sample of one hundred eighty-one participants.

## PROCEDURE

Emotion induction manipulation was similar to the previous studies. Right after the writing task participants indicated to what extent five statements (based on Snyder et al., 1991; Tracy and Robins, 2007) were related to the situation they wrote, randomly ordered, on a 7-point scale (1 = not at all, and 7 = extremely). Two statements measured the direct emotions of hope and pride (i.e., *This situation makes me feel hopeful*; *This situation makes me feel proud*). Two sentences measured the essays' temporal focus (*This situation will happen in the future*; *This situation happened in the past*), and one statement measured perceptions related to goal achievement (*I feel that a personal goal has been achieved*).

Similar to previous experiments, participants then took part in a supposedly unrelated survey about health-care advertising campaign. Those exposed to the warning ad about skin cancer (study 4A), were told that CDC (Centers for Disease Control and Prevention) was designing an advertising campaign targeted at people like them. They were then invited to collaborate with the campaign by evaluating the ad and answering some questions. Participants read in the loss [gain] frame ad title: *Avoid damages to your skin and your life [Have a healthy skin and a longer life]*. The ad information about the disease was: *If you don't wear sunscreen everyday, you will be vulnerable to skin cancer. Don't be careless, living sick is much more difficult. [If you wear sunscreen everyday, you will be protected from skin cancer. Be smart, living healthy is much more pleasurable]*. The ad appeal was the same for the loss and gain frame conditions: *Wear sunscreen*. See appendix B for the warning ads details.

Those exposed to the warning ad about hepatitis advertising (study 4B), were told that American Liver Foundation was designing an advertising campaign target at people like them. They were then invited to collaborate with the campaign by evaluating the ad and answering some questions. Participants read in the loss [gain] frame ad title: *Avoid damages to your liver and your life [Have a healthy liver and a longer life]*. The ad information about the disease was: *The hepatitis virus is more common and infectious than the Aids virus. Yellowing of the skin or eyes can signal hepatitis, although most people have no recognizable signs or symptoms. Untreated, hepatitis can cause serious damage to your liver. Don't be careless, living sick is much more difficult [When detected earlier, hepatitis can be treated and your liver preserved. Be smart, living healthy is much more pleasurable]*. The ad appeal was the same for the loss and gain frame conditions: *Get tested*. See appendix B for the warning ads details.

After reading the ad, a framing manipulation check, following Block and Keller (1995) and Mogilner, Aaker and Pennington (2007) studies, asked participants to indicate the extent the ad emphasizes positive or negative implications, on a 7-point scale (1 = not at all, and 7 = extremely): *The ad emphasizes the positive implications (benefits) of following the recommended action; The ad emphasizes the negative implications (harms) of not following the recommended action*.

Then, based on Agrawal, Menon and Aaker (2007), we measured participants self-risk perception by two items, on a 7-point scale: *Please indicate how likely you are to develop skin cancer if you don't wear sunscreen [vs. how likely you are to have hepatitis]* (1 = not at all likely, and 7 = very likely); *Please indicate how concerned you are about developing skin cancer [vs. how concerned you are about getting hepatitis]* (1 = not at all concerned, and 7 = very concerned). Then participants indicated their compliance intention to the health-care ad appeal, by two items, on a 7-point scale: *Please indicate how likely you are to wear sunscreen everyday [vs. how likely you are to get tested for hepatitis]* (1 = not at all likely, and 7 = very likely); *Please indicate your interest in receiving more information about ways to prevent skin cancer [vs. your interest in receiving more information about ways of contracting hepatitis]* (1 = definitely not interested, and 7 = definitely interested).

We followed the same procedures of previous studies for attention checks. Finally, participants were asked to provide their demographic information. At the end of the session, participants were thanked for their participation and dismissed.

## RESULTS – Study 4A

### *Manipulation Checks*

*Emotions.* The two-way ANOVA results on emotion-manipulation check indicated a main effect of emotion condition on hopeful score ( $F(1, 171) = 11.532, p < .001; \eta_p^2 = .064$ ) and proud score ( $F(1, 171) = 39.718, p < .001; \eta_p^2 = .191$ ). No main effect of frame condition or interaction were observed. Planned contrasts indicated that within gain frame condition, hopeful score was higher for hope than pride condition ( $M_{\text{hope-gain}} = 5.83; SD = 1.21$  vs.  $M_{\text{pride-gain}} = 4.92; SD = 1.62, p < .005; \eta_p^2 = .061$ ) and proud score was higher for pride than hope condition ( $M_{\text{pride-gain}} = 6.62; SD = .594$  vs.  $M_{\text{hope-gain}} = 5.46; SD = 1.39, p < .001; \eta_p^2 = .111$ ). Within loss frame condition, although the hopeful score was higher for hope than pride condition, the difference did not reach statistical significance ( $M_{\text{hope-loss}} = 5.83; SD = 1.24$  vs.  $M_{\text{pride-loss}} = 5.35; SD = 1.24, p = .094$ ) and proud score was higher for pride than hope condition ( $M_{\text{pride-loss}} = 6.50; SD = .851$  vs.  $M_{\text{hope-loss}} = 5.63; SD = 1.13, p < .001; \eta_p^2 = .076$ ). These results indicated that the writing task successfully induced hope and pride emotions in the skin cancer scenario (study 4A).

*Temporal Focus.* The two-way ANOVA results on emotion-manipulation check indicated that there was a main effect of emotion condition on future temporal focus score ( $F(1, 171) = 82.820, p < .001; \eta_p^2 = .330$ ), as well as on past temporal focus score ( $F(1, 171) = 58.011, p < .001; \eta_p^2 = .257$ ). No main effect of frame condition or interaction were observed. Planned contrasts indicated that within gain frame condition, future temporal score was higher for hope than pride condition ( $M_{\text{hope-gain}} = 6.02; SD = .977$  vs.  $M_{\text{pride-gain}} = 3.65; SD = 2.11, p < .001; \eta_p^2 = .169$ ) and past temporal focus score was higher for pride than hope condition ( $M_{\text{pride-gain}} = 5.38; SD = 2.13$  vs.  $M_{\text{hope-gain}} = 3.41; SD = 1.95, p < .001; \eta_p^2 = .133$ ). Within loss frame condition, future temporal focus score was higher for hope than pride condition ( $M_{\text{hope-loss}} = 6.02; SD = 1.19$  vs.  $M_{\text{pride-loss}} = 3.81; SD = 2.02, p < .001; \eta_p^2 = .162$ ) and past temporal focus score was higher for pride than hope condition ( $M_{\text{pride-loss}} = 5.73; SD = 1.64$  vs.  $M_{\text{hope-loss}} = 3.20; SD = 2.00, p < .001; \eta_p^2 = .171$ ). These results indicated that the writing task successfully induced hope and pride, characterized by their respective temporal appraisals of future and past temporal focus, in the skin cancer scenario.

*Goal achievement.* Pride and hope are also characterized by contrasting appraisals related to goal achievement. Pride is related to an achieved goal, whereas hope is related to a goal not yet achieved. Therefore, high score of the statement “*I feel that a personal goal has been achieved*” reflects the emotion of pride rather than hope. The two-way ANOVA results on emotion-manipulation check indicated a main effect of emotion condition on goal achievement score ( $F(1, 171) = 36.383, p < .001; \eta_p^2 = .178$ ). No main effect of frame condition or interaction were observed. Planned contrasts indicated that within gain frame condition, goal achievement score was higher for pride than hope condition ( $M_{\text{pride-gain}} = 6.19; SD = 1.10$  vs.  $M_{\text{hope-gain}} = 4.65; SD = 1.59, p < .001; \eta_p^2 = .108$ ), as well as within loss frame condition ( $M_{\text{pride-loss}} = 5.90; SD = 1.40$  vs.  $M_{\text{hope-loss}} = 4.78; SD = 1.54, p < .001; \eta_p^2 = .086$ ). As such, these results also indicated that the writing task successfully induced hope and pride, characterized by their related goal achievement status, in the skin cancer scenario (study 4A).

*Message Frame.* The two-way ANOVA results on frame-manipulation check indicate that there was a main effect of frame condition on positive score ( $F(1, 171) = 29.51, p < .001; \eta_p^2 = .149$ ), as well as on negative score ( $F(1, 171) = 79.24, p < .001; \eta_p^2 = .321$ ). No main effect of emotion condition or interaction were observed. Planned contrasts indicated that within hope condition, positive score was higher for gain than loss frame condition ( $M_{\text{hope-gain}} = 5.41; SD = 1.40$  vs.  $M_{\text{hope-loss}} = 4.27; SD = 1.95, p < .005, \eta_p^2 = .051$ ) and negative score was higher for loss than gain frame conditions ( $M_{\text{hope-loss}} = 5.63; SD = 1.62$  vs.  $M_{\text{hope-gain}} = 3.46; SD = 1.62, p < .001, \eta_p^2 = .179$ ). Within pride condition, positive score was higher for gain than loss frame condition ( $M_{\text{pride-gain}} = 5.83; SD = 1.21$  vs.  $M_{\text{pride-loss}} = 4.02; SD = 2.24, p < .001, \eta_p^2 = .115$ ) and negative score was higher for loss than gain frame condition ( $M_{\text{pride-loss}} = 5.75; SD = 1.55$  vs.  $M_{\text{pride-gain}} = 3.35; SD = 1.93, p < .001, \eta_p^2 = .203$ ). These results indicate that the frame manipulation successfully induced loss and gain frames in the skin cancer scenario (study 4A).

### ***Hypotheses Tests***

*Self-Risk Perception.* A self-risk perception index was created by averaging the two items ( $r = .40$ ). The results of a two-way ANOVA indicate no main effect of emotion condition ( $F(1, 168) = .012, p = .912$ ) or of frame condition on self-risk perception ( $F(1, 168) = 2.119, p =$

.147). However, the expected interaction effect was significant ( $F(1, 168) = 7.449, p < .01, \eta_p^2 = .042$ ), as shown in Figure 9.

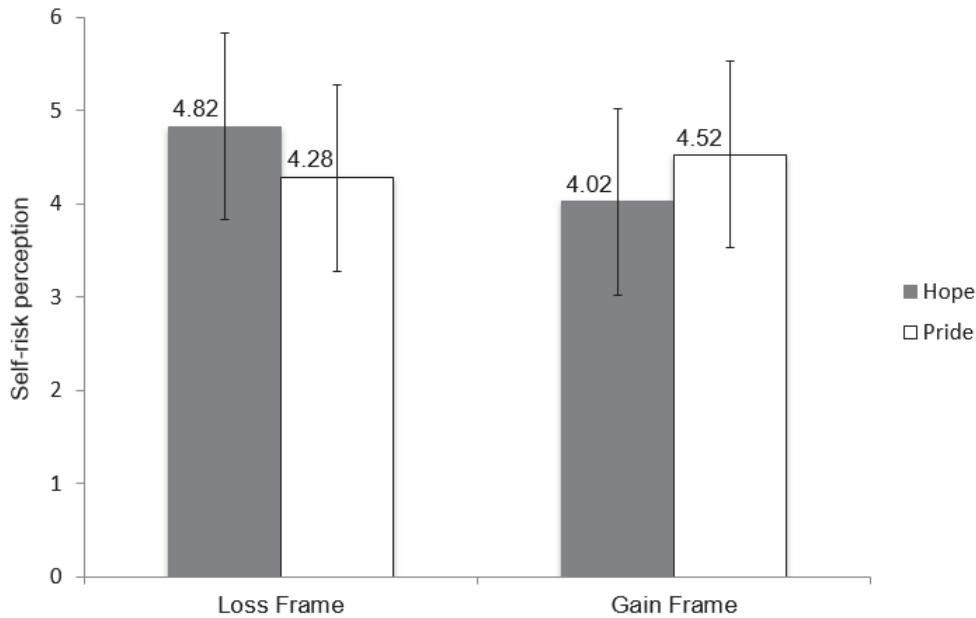


Figure 9: Emotion and message frame on self-risk perception (study 4A – Skin Cancer Ad)

Figure 9 shows that self-risk perception score within the loss frame condition was statistically significant higher for those in the hope condition than for those in the pride condition ( $M_{\text{hope-loss}} = 4.82; SD = 1.25$  vs.  $M_{\text{pride-loss}} = 4.28; SD = 1.36$ ) ( $F(1, 168) = 4.191, p < .05, \eta_p^2 = .024$ ). Within the gain frame condition, although the score of self-risk perception was higher for those in the pride than hope conditions, the difference did not reach statistical significance ( $M_{\text{pride-gain}} = 4.52; SD = 1.21$  vs.  $M_{\text{hope-gain}} = 4.02; SD = 1.17$ ) ( $F(1, 168) = 3.304, p = .071$ ). Participants in the hope condition showed higher self-risk perception in the loss frame condition than in the gain frame condition ( $M_{\text{hope-loss}} = 4.82; SD = 1.25$  vs.  $M_{\text{hope-gain}} = 4.02; SD = 1.17$ ) ( $F(1, 168) = 8.921, p < .005, \eta_p^2 = .050$ ). And for those in the pride condition shows no statistical difference between loss and gain frame conditions for their self-risk perception ( $M_{\text{pride-loss}} = 4.28; SD = 1.36$  vs.  $M_{\text{pride-gain}} = 4.52; SD = 1.21$ ) ( $F(1, 168) = .797, p = .373$ ).

*Compliance Intention.* A compliance intention index was created by averaging the two items ( $r = .60$ ). The results of a two-way ANOVA indicated no main effect of emotion ( $F(1, 168) = .050, p = .823$ ) or of message frame condition on compliance intention ( $F(1, 168) = .938, p =$



.334). However, the expected interaction effect was significant ( $F(1, 168) = 5.640, p < .05, \eta_p^2 = .032$ ), as shown in Figure 10.

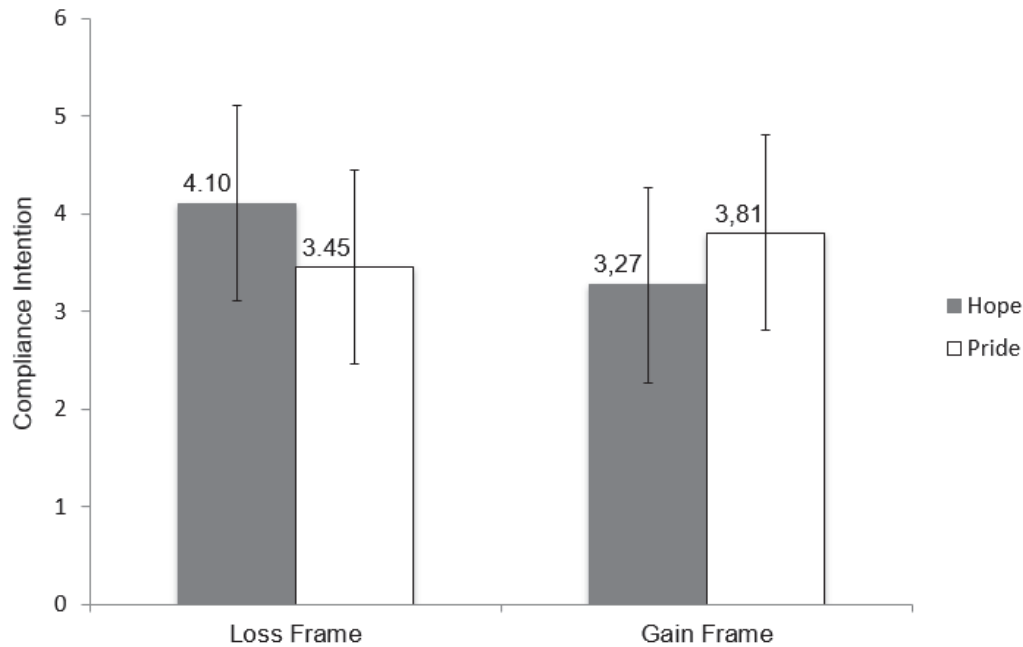


Figure 10: Emotion and message frame on compliance intention (study 4A – Skin Cancer Ad)

Figure 10 shows that compliance intention score within loss frame condition, although the score was higher for those in the hope condition than for those in the pride condition, the difference did not reach statistical significance ( $M_{\text{hope-loss}} = 4.10; SD = 1.42$  vs.  $M_{\text{pride-loss}} = 3.45; SD = 1.72$ ) ( $F(1, 168) = 3.509, p = .063$ ). Within gain frame condition, compliance intention shows no statistical difference between pride and hope conditions ( $M_{\text{pride-gain}} = 3.81; SD = 1.86$  vs.  $M_{\text{hope-gain}} = 3.27; SD = 1.51$ ) ( $F(1, 168) = 2.229, p = .137$ ). Participants in the hope conditions showed higher compliance intention in the loss frame conditions than in the gain frame condition ( $M_{\text{hope-loss}} = 4.10; SD = 1.42$  vs.  $M_{\text{hope-gain}} = 3.27; SD = 1.51$ ) ( $F(1, 168) = 5.694, p < .05, \eta_p^2 = .033$ ). Within pride condition there was no statistical difference between loss and gain frame conditions ( $M_{\text{pride-loss}} = 3.45; SD = 1.72$  vs.  $M_{\text{pride-gain}} = 3.81; SD = 1.86$ ) ( $F(1, 168) = .971, p = .326$ ).

*Mediation Analysis.* Following Preacher and Hayes (2004), the mediation analysis was tested through bootstrapping. A 95% confidence interval (CI) of the parameter estimates was obtained by running the resampling 10,000 times. The independent variables were coded as 1 = hope and 0 = pride (emotions), and 1 = loss and 0 = gain (message frame). To test several

paths of mediation, we used model 8 of Hayes (2013) process macro. The mediation analysis was conducted to evaluate the indirect effect of emotions upon compliance intention through self-risk perception moderated by message frame, as shown in Figure 11.

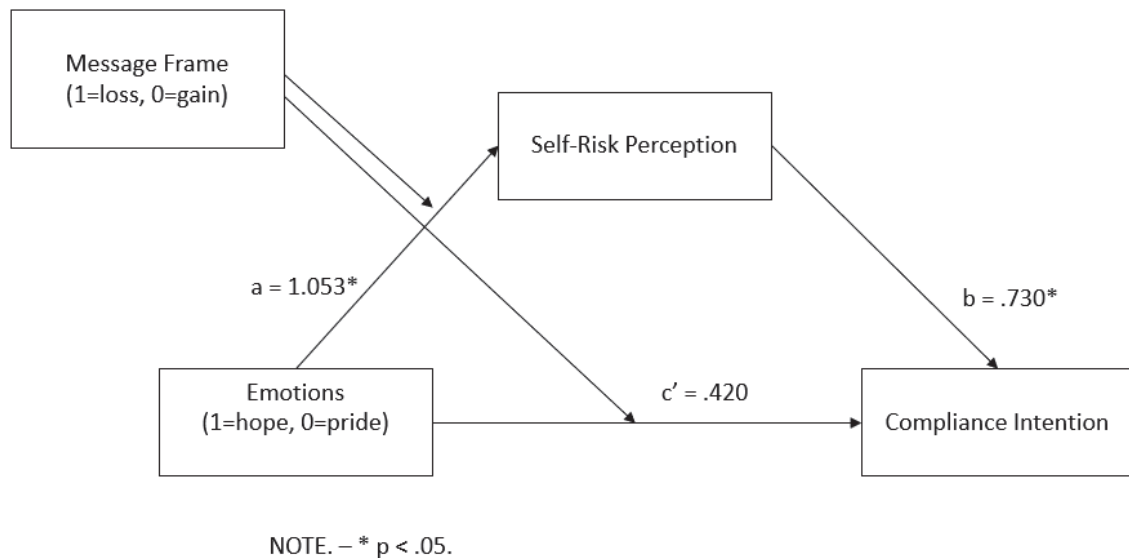


Figure 11: Moderated Mediation Model (study 4A – Skin Cancer Ad)

The results shown in Figure 11 indicate a significant interaction effect of emotion and message frame on self-risk perception ( $Coef = 1.053$ ;  $CI = .291$  to  $1.815$ ), whereas self-risk perception significantly impact compliance intention ( $Coef = .730$ ;  $CI = .566$  to  $.894$ ). The interaction on compliance intention was not significant ( $Coef = .420$ ;  $CI = -.417$  to  $1.259$ ). The expected indirect effect of self-risk perception between emotions and message frame interaction on compliance intention was significant (indirect effect =  $.769$ ,  $95\% CI = .223$  to  $1.341$ ). When the message frame was focused on losses there was a positive conditional indirect effect of risk on consumers' compliance intention ( $Coef = .400$ ;  $CI = .004$  to  $.807$ ). However, when the message frame was focused on gains, there was no significant conditional indirect effect ( $Coef = -.369$ ;  $CI = -.759$  to  $.008$ ). No other result has emerged.

## RESULTS – Study 4B

### *Manipulation Checks*

*Emotions.* The two-way ANOVA results on emotion-manipulation check indicated a main effect of emotion condition on hopeful score ( $F(1, 180) = 8.148, p < .005; \eta_p^2 = .044$ ) and proud score ( $F(1, 180) = 9.837, p < .005; \eta_p^2 = .053$ ). No main effect of frame condition or interaction were observed. Planned contrasts indicated that within gain frame condition, hopeful score was higher for hope than pride condition ( $M_{\text{hope-gain}} = 6.52; SD = .623$  vs.  $M_{\text{pride-gain}} = 6.11; SD = 1.06, p = .042; \eta_p^2 = .023$ ) and proud score was higher for pride than hope condition ( $M_{\text{pride-gain}} = 6.30; SD = 1.15$  vs.  $M_{\text{hope-gain}} = 5.76; SD = 1.15, p < .05; \eta_p^2 = .031$ ). Within loss frame condition, hopeful score was higher for hope than pride condition ( $M_{\text{hope-loss}} = 6.33; SD = .919$  vs.  $M_{\text{pride-loss}} = 5.91; SD = 1.20, p < .05; \eta_p^2 = .022$ ) and proud score was higher for pride than hope condition ( $M_{\text{pride-loss}} = 6.33; SD = .929$  vs.  $M_{\text{hope-loss}} = 5.86; SD = 1.06, p < .05; \eta_p^2 = .023$ ). These results indicated that the writing task successfully induced hope and pride emotions in the hepatitis scenario.

*Temporal Focus.* The two-way ANOVA results on emotion-manipulation check indicated that there was a main effect of emotion condition on future temporal focus score ( $F(1, 180) = 61.736, p < .001; \eta_p^2 = .259$ ), as well as on past temporal focus score ( $F(1, 180) = 109.709, p < .001; \eta_p^2 = .383$ ). No main effect of frame condition or interaction were observed. Planned contrasts indicated that within gain frame condition, future temporal score was higher for hope than pride condition ( $M_{\text{hope-gain}} = 5.93; SD = 1.48$  vs.  $M_{\text{pride-gain}} = 3.85; SD = 2.27, p < .001; \eta_p^2 = .140$ ) and past temporal focus score was higher for pride than hope condition ( $M_{\text{pride-gain}} = 5.62; SD = 1.80$  vs.  $M_{\text{hope-gain}} = 3.07; SD = 1.97, p < .001; \eta_p^2 = .204$ ). Within loss frame condition, future temporal focus score was higher for hope than pride condition ( $M_{\text{hope-loss}} = 5.88; SD = 1.17$  vs.  $M_{\text{pride-loss}} = 3.60; SD = 2.27, p < .001; \eta_p^2 = .157$ ) and past temporal focus score was higher for pride than hope condition ( $M_{\text{pride-loss}} = 5.98; SD = 1.51$  vs.  $M_{\text{hope-loss}} = 2.84; SD = 1.98, p < .001; \eta_p^2 = .269$ ). These results indicated that the writing task successfully induced hope and pride, characterized by their respective temporal appraisals of future and past temporal focus, in the hepatitis scenario.

*Goal achievement.* The two-way ANOVA results on emotion-manipulation check indicated a main effect of emotion condition on goal achievement score ( $F(1, 180) = 28.195, p < .001;$

$\eta_p^2 = .128$ ). No main effect of frame condition or interaction were observed. Planned contrasts indicated that within gain frame condition, goal achievement score was higher for pride than hope condition ( $M_{\text{pride-gain}} = 5.89$ ;  $SD = 1.25$  vs.  $M_{\text{hope-gain}} = 4.89$ ;  $SD = 1.71$ ,  $p < .001$ ;  $\eta_p^2 = .057$ ), as well as within loss frame condition ( $M_{\text{pride-loss}} = 6.20$ ;  $SD = 1.16$  vs.  $M_{\text{hope-loss}} = 4.91$ ;  $SD = 1.61$ ,  $p < .001$ ;  $\eta_p^2 = .079$ ). As such, these results also indicated that the writing task successfully induced hope and pride, characterized by their related goal achievement status, in the hepatitis scenario.

*Message Frame.* The two-way ANOVA results on frame-manipulation check indicate that there was a main effect of frame condition on positive score ( $F(1, 180) = 41.438$ ,  $p < .001$ ;  $\eta_p^2 = .190$ ), as well as on negative frame score ( $F(1, 180) = 22.989$ ,  $p < .001$ ;  $\eta_p^2 = .115$ ). No main effect of emotion condition or interaction were observed. Planned contrasts indicated that within hope condition, positive score was higher for gain than loss frame condition ( $M_{\text{hope-gain}} = 5.41$ ;  $SD = 1.66$  vs.  $M_{\text{hope-loss}} = 4.23$ ;  $SD = 1.98$ ,  $p < .005$ ;  $\eta_p^2 = .053$ ) and negative score was higher for loss than gain frame conditions ( $M_{\text{hope-loss}} = 5.21$ ;  $SD = 1.89$  vs.  $M_{\text{hope-gain}} = 4.24$ ;  $SD = 1.93$ ,  $p < .05$ ;  $\eta_p^2 = .032$ ). Within pride condition, positive score was higher for gain than loss frame condition ( $M_{\text{pride-gain}} = 5.68$ ;  $SD = 1.60$  vs.  $M_{\text{pride-loss}} = 3.47$ ;  $SD = 1.82$ ,  $p < .001$ ;  $\eta_p^2 = .169$ ) and negative score was higher for loss than gain frame condition ( $M_{\text{pride-loss}} = 5.62$ ;  $SD = 1.58$  vs.  $M_{\text{pride-gain}} = 3.91$ ;  $SD = 2.05$ ,  $p < .001$ ;  $\eta_p^2 = .097$ ). These results indicate that the frame manipulation successfully induced loss and gain frames in the hepatitis scenario.

### ***Hypotheses Tests***

*Self-Risk Perception.* A self-risk perception index was created by averaging the two items ( $r = .30$ ). The results of a two-way ANOVA indicate no main effect of emotion condition ( $F(1, 180) = .036$ ,  $p = .830$ ) or of frame condition ( $F(1, 180) = 1.198$ ,  $p = .275$ ) on self-risk perception. However, the expected interaction effect was significant ( $F(1, 180) = 18.122$ ,  $p < .001$ ,  $\eta_p^2 = .093$ ), as shown in Figure 12.

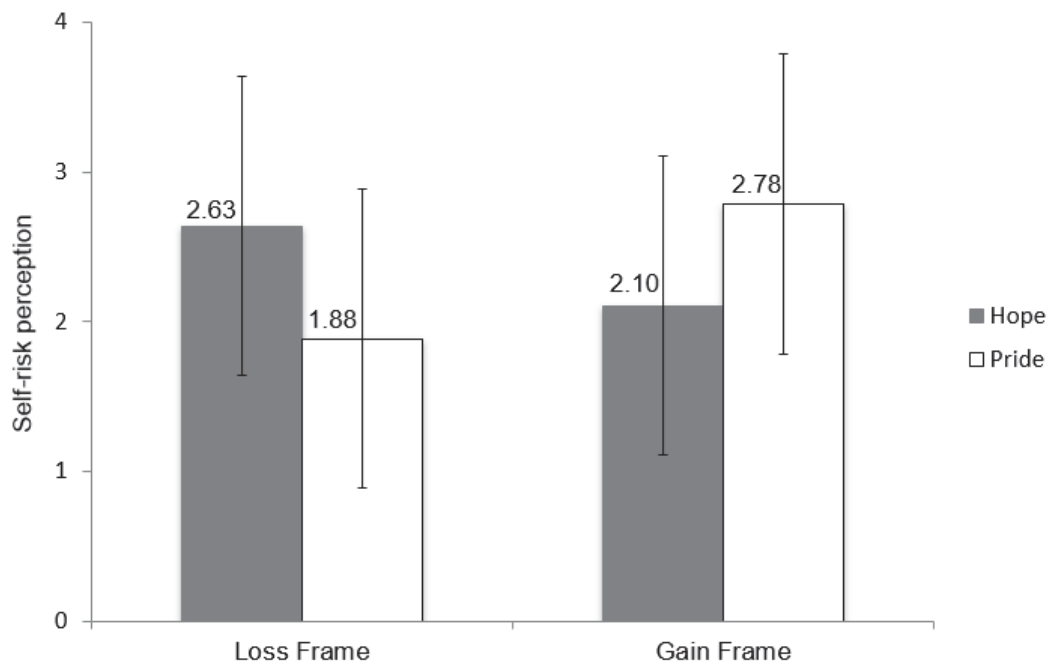


Figure 12: Emotion and message frame on self-risk perception (study 4B – Hepatitis Ad)

Figure 12 shows that self-risk perception score within the loss frame condition was statistically significant higher for those in the hope condition than for those in the pride condition ( $M_{\text{hope-loss}} = 2.63$ ;  $SD = 1.33$  vs.  $M_{\text{pride-loss}} = 1.88$ ;  $SD = .95$ ) ( $F(1, 177) = 9.728$ ,  $p = .002$ ,  $\eta_p^2 = .052$ ). Within the gain frame condition, self-risk perception was higher for those in the pride than hope conditions ( $M_{\text{pride-gain}} = 2.78$ ;  $SD = 1.24$  vs.  $M_{\text{hope-gain}} = 2.10$ ;  $SD = .93$ ) ( $F(1, 177) = 8.404$ ,  $p < .005$ ,  $\eta_p^2 = .045$ ). Participants in the hope condition showed higher self-risk perception in the loss frame condition than in the gain frame condition ( $M_{\text{hope-loss}} = 2.63$ ;  $SD = 1.33$  vs.  $M_{\text{hope-gain}} = 2.10$ ;  $SD = .93$ ) ( $F(1, 177) = 4.917$ ,  $p < .05$ ,  $\eta_p^2 = .027$ ). Participants in the pride condition shows higher self-risk perception in the gain frame condition than in the loss frame condition ( $M_{\text{pride-gain}} = 2.78$ ;  $SD = 1.24$  vs.  $M_{\text{pride-loss}} = 1.88$ ;  $SD = .95$ ) ( $F(1, 177) = 14.567$ ,  $p < .001$ ,  $\eta_p^2 = .076$ ).

*Compliance Intention.* A compliance intention index was created by averaging the two items ( $r = .50$ ). The results of a two-way ANOVA indicated no main effect of emotion ( $F(1, 180) = .296$ ,  $p = .587$ ) on compliance intention, but there was a main effect of message frame condition ( $F(1, 180) = 9.382$ ,  $p < .005$ ,  $\eta_p^2 = .050$ ) as well as the expected interaction effect ( $F(1, 180) = 6.360$ ,  $p < .05$ ,  $\eta_p^2 = .035$ ), as shown in Figure 13.

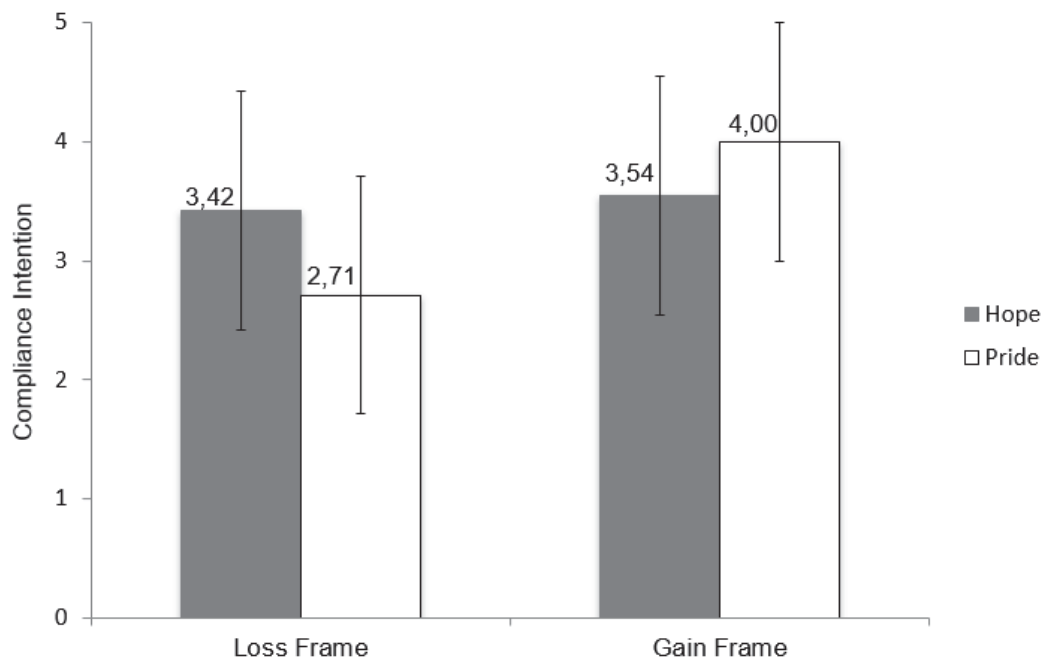
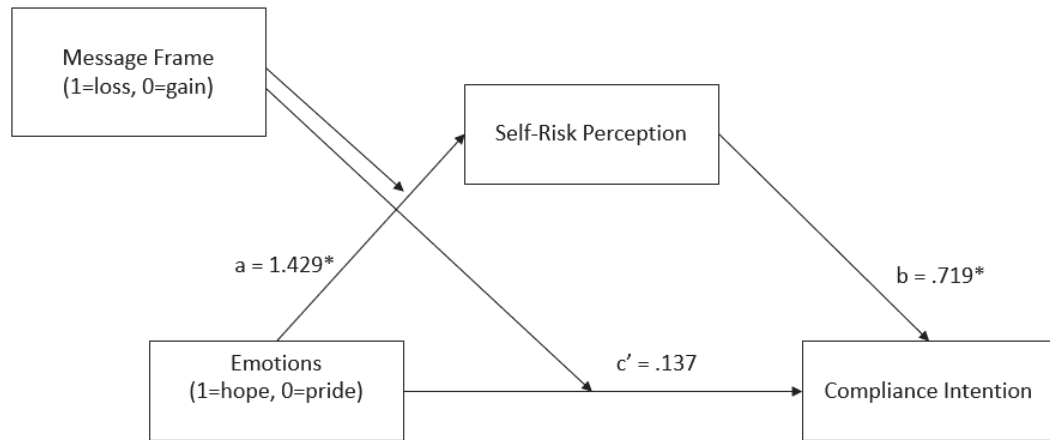


Figure 13: Emotion and message frame on compliance intention (study 4B – Hepatitis Ad)

Figure 13 shows that compliance intention score within loss frame condition was higher for those in the hope condition than for those in the pride condition ( $M_{\text{hope-loss}} = 3.42$ ;  $SD = 1.66$  vs.  $M_{\text{pride-loss}} = 2.71$ ;  $SD = 1.31$ ) ( $F(1, 177) = 4.572, p < .05, \eta_p^2 = .025$ ). Within gain frame condition, compliance intention shows no statistical difference between pride and hope conditions ( $M_{\text{pride-gain}} = 4.00$ ;  $SD = 1.63$  vs.  $M_{\text{hope-gain}} = 3.54$ ;  $SD = 1.56$ ) ( $F(1, 177) = 2.012, p = .158$ ). Participants in the hope conditions showed no statistical difference between loss and gain frame condition ( $M_{\text{hope-loss}} = 3.42$ ;  $SD = 1.66$  vs.  $M_{\text{hope-gain}} = 4.00$ ;  $SD = 1.63$ ) ( $F(1, 177) = .144, p = .705$ ). Within pride condition participants showed higher compliance intention in the gain than loss frame condition ( $M_{\text{pride-gain}} = 4.00$ ;  $SD = 1.63$  vs.  $M_{\text{pride-loss}} = 2.71$ ;  $SD = 1.31$ ) ( $F(1, 177) = 15.863, p < .001, \eta_p^2 = .082$ ).

*Mediation Analysis.* Following Preacher and Hayes (2004), the mediation analysis was tested through bootstrapping. A 95% confidence interval (CI) of the parameter estimates was obtained by running the resampling 10,000 times. The independent variables were coded as 1 = hope and 0 = pride (emotions), and 1 = loss and 0 = gain (message frame). To test several paths of mediation, we used model 8 of Hayes (2013) process macro. The mediation analysis was conducted to evaluate the indirect effect of emotions upon compliance intention through self-risk perception moderated by message frame, as shown in Figure 14.



NOTE. – \*  $p < .05$ .

Figure 14: Moderated Mediation Model (study 4B – Hepatitis Ad)

The results shown in Figure 14 indicate a significant interaction effect of emotion and message frame on self-risk perception ( $Coef = 1.429$ ;  $CI = .767$  to  $2.092$ ), whereas self-risk perception significantly impact compliance intention ( $Coef = .719$ ;  $CI = .545$  to  $.893$ ). The interaction on compliance intention was not significant ( $Coef = .137$ ;  $CI = -.681$  to  $.954$ ). The expected indirect effect of self-risk perception between emotions and message frame interaction on compliance intention was significant (indirect effect =  $1.028$ ,  $95\% CI = .524$  to  $1.574$ ). When the message frame was focused on losses there was a positive conditional indirect effect of risk on consumers' compliance intention ( $Coef = .540$ ;  $CI = .187$  to  $.933$ ) and when the message frame was focused on gains there was a negative conditional indirect effect ( $Coef = -.488$ ;  $CI = -.826$  to  $-.165$ ). No other result has emerged.

## DISCUSSION

Studies 4A and 4B corroborate our hypothesis 4 and provide further evidences to the proposed impact of incidental hope and pride on consumers' response to health-care warning messages framed on losses or gains focus. Results for the skin cancer advertising the use of sunscreen (study 4A) show that when the warning message was focused on losses about the implications of not following the recommended preventive behavior, the results replicate our previous findings. That is, incidental hope, compared to incidental pride, increases self-risk

perception, which in turn leads consumers to present an increased compliance intention with the health-care ad appeal. However, when the warning message was focused on gains about the implications of following the recommended preventive behavior, hope and pride affective states did not differently impact risk perception and compliance, although the perception of risk in the gain frame condition is marginally higher for the pride, compared to the hope condition. Moreover, there is evidence that the indirect effect of risk perception on the influence of hope on compliance is driven by the loss frame condition.

The results for the warning message about hepatitis (study 4B) replicate the preference of loss frame messages for those in the future-oriented emotion of hope, increasing risk perception and compliance. However, this domain showed a stronger evidence for the preference of gain frame when individuals are feeling proud. The indirect effect of risk perception was positive when future-oriented emotion of hope was exposed to the loss message frame and negative exposed to the gain message frame.

Overall, the main results of studies 4A and 4B contribute by providing further evidences for the effect of future- and past-oriented emotions on consumers' responses to risk perception and compliance in the domain of health-care warning messages. That is, incidental hope shows higher self-risk perception and compliance when the message frame is focused on losses than gains, whereas incidental pride shows higher self-risk perception and compliance when the message frame is focused on gain than losses.



## GENERAL DISCUSSION

Addressing the relationships among emotions, temporal focus, and risk perception highlight significant issues regarding compliance to attitudes that directly impact the well-being of consumers. Through a series of four experiments, the present research demonstrates that temporal-focused positive emotions impact consumers risk perception and compliance with health-care warning messages.

Experiments 1 and 2 show that the future-oriented emotion of hope has a higher impact on compliance with health-care warning messages compared to the past-oriented emotion of pride. Risk perception mediates this effect. Study 3 provides an important contribution, demonstrating that affective temporal focus has the opposite effect on risk perception compared to no-affective related temporal focus. Finally, study 4 provides further evidences by exploring the condition of loss versus gain message frames. The results show initial evidence that warning messages advertising the positive benefits of health-care increases risk perception and compliance for those in the affective state of pride, whereas the message framing the possible losses and negative outcomes seem to be more effective for those in the future-oriented emotional state of hope.

### Contributions and Implications

This research contributes to the literature on temporal construal level and its impact on risk-taking behavior. Past research has showed that future, compared to past or present temporal focus shows higher risk-taking behavior (Sagristano, Trope & Liberman, 2002; Trope & Liberman, 2010; Lerner et al., 2015). This study moves a step further by showing that positive affective temporal focus, measured as hope and pride incidental states, influences individual's risk perception in the opposite direction. If consumers experience the emotional reactions of temporal focus, such as being hopeful to achieve future outcomes or proud of what has been attained, risk perception is higher for the future compared to past temporal focus.

As a consequence, this study also contributes to the literature of positive emotions and cognitive appraisals associated with specific affective reaction (Griskevicius, Shiota, & Nowlis, 2010; Wilcox, Kramer, & Sen, 2010; Winterich & Haws, 2011; Salerno, Laran, &

Janiszewski, 2015; Coleman et al., 2017). When temporal focus is associated with emotions, people experience the affective reactions of these emotions, which impacts perceptions about possible consequences, such as those in preventive domains.

The current research also contributes to the literature on message frames (Block & Keller, 1995; Rothman, & Salovey, 1997; Mogilner, Aaker, & Pennington, 2007; Cho & Sands, 2011). Prior research has primarily examined the preference for positive gain message frames when consumers are in a pride emotional state (Higgins, et al., 2001; Mantovani et al., 2018). Past research has also associated pride to higher risk-taking behavior (Tracy & Robins, 2004; Wilcox, Kramer, & Sen, 2010; So et al., 2015; Weidman, Tracy, & Elliot, 2016). However, we find initial evidence that pride-oriented temporal focus increases risk perception and compliance when warning messages are advertised in gain frames. There is also evidence that hope-oriented temporal focus increases risk perception and compliance when messages are advertised in loss frames. Although it is necessary to further explore these results to enhance its consistency, this is the first study to find association between hope and message frame preferences.

There is substantial research on the impact of negative emotions on warning messages (Maheswaran & Chaiken, 1991; Menon, Block, & Ramanathan, 2002; Passyn & Sujun, 2006; Menon, Raghurir, & Agrawal, 2006) and risk-taking behavior (Lerner & Keltner, 2000, 2001; Koutchaki, Oveis, & Gino, 2014; Ferrer, Maclay, Litvak, & Lerner, 2016), but there is scant research about the influence of positive emotions on this domain of behavior (see Agrawal, Menon & Aaker, 2007 for an exception). Our work is distinct from the study of Agrawal et al. (2007) because we explore the incidental effect of temporal appraisal dimension (future versus past) of specific positive emotions (hope versus pride) on consumers' compliance with health-care warning messages, whereas the Agrawal et al. (2007) study explores the incidental effect of relatedness appraisal dimension (self versus other) of specific positive emotions (happiness versus peacefulness) on consumers' compliance with health-care warning messages. Therefore, we contribute by demonstrating further evidences about how incidental positive emotions may influence compliance with health-care warning messages, bringing different positive emotions and different cognitive appraisal dimensions to this relationship.

This is particularly important because it adds to the growing work on health-care literature (Block & Keller, 1995; Raghurir & Menon, 1998; Rothman & Salovey, 1997; Chandran & Menon, 2004; Menon, Raghurir, & Agrawal, 2006; Agrawal, Menon & Aaker, 2007; Mogilner, Aaker, & Pennington, 2007; Kees, 2010; Yan & Sengupta, 2012; Murdock &

Rajagopal, 2017; Chen, 2018), showing the role of specific positive emotions (i.e., hope and pride) influencing individuals' compliance with health-care warning messages, which is especially relevant to persuasion strategy when the consumer is in a positive mood state (Salovey et al., 2000).

Regarding societal issues that emerge from risk-taking behavior in the health-care domain, this research addresses important managerial contributions for public policy actions. It is established that risk-taking decisions are impacted by emotions (DeSteno et al., 2004; Koutchaki, Oveis, & Gino, 2014) and also by temporal focus perspective (Lerner et al., 2015). However, the findings of this research suggest that managers should consider emotion valence and temporal focus of these emotions to promote compliance with health-care warning messages. For instance, individuals focused in the future may be more cooperative and less risk-taking when there is hope associated with this temporal focus. However, the risk-taking associated with the emotional state of pride may be reduced when the warning message is gain-framed.

Also, warning messages are more often associated with negative emotions (i.e., fear, guilt, shame, sadness) because these emotions are frequently experienced as a consequence of risky behavior, but in most of the circumstances of risky consumption, consumers are in a positive affective state. For instance, campaigns for wearing sunscreen are often advertised during the summer, warning messages about STDs prevention are more often communicated during the Carnival in Brazil. These are moments where consumers are in a positive emotional state.

It is noteworthy that the goals of health-related communication are often to make people more informed and to get people to change their behavior (Menon, Block, & Ramanathan, 2002). Therefore, getting people to be more aware about risk behaviors is an important persuasion strategy to impact people before the possible time to act at risk. As a concrete example of this strategy, sequential outdoors could be used, on the road, during the summer season, to reach the public that is going to the beach. An outdoor with a skin cancer prevention ad could be exposed right after an outdoor in which the emotion of hope is highlighted, such as remembering that the beginning of the year is the best time to renew hopes and set new goals to be achieved. Another moment that the audience is in a positive emotional state is during the trip to their destination of travel to enjoy the party of Carnival in Brazil, for example. Sponsored articles could be used in the onboard magazines with the Carnival theme on the cover. The sponsored articles could be strategically created to prime the emotion of hope, whereas the STDs prevention ad is presented alongside.

## Limitations and Future Research

One potential limitation is that hope and pride are not only temporal-oriented emotions, but are characterized by other appraisals such as certainty, control, responsibility and goal related. It is unknown whether the effect of the emotional state on risk perception and compliance was caused only by temporal appraisal or by the association with other appraisals. Past research has associated the appraisals of certainty and control of negative emotions with risk-taking behavior (Lerner & Keltner, 2000, 2001; Koutchaki, Oveis, & Gino, 2014; Ferrer, Maclay, Litvak, & Lerner, 2016). Future research could further investigate this issue.

Goal attainment status is a cognitive appraisal that can also be related to the effect of hope and pride on risk-related outcomes. A goal yet to be attained may influence individuals to become more concerned with the possible consequences of their behavior, which may impact consumers' risk-related outcomes in preventive domain. Performance feedback could be employed (Mantovani, Andrade, & Prado, 2008) to test the impact of incidental goal (no)attainment on individuals' compliance with warning messages.

As a follow-up to our study, future research could compare the incidental effect of future-oriented positive and negative emotions in different contexts of prevention domain. For example, life insurance ad is target to an audience that is not necessarily in a positive mood state. In this case the incidental negative emotions may be more effective in getting the audience to perceive a greater risk in the warning message, since the chance of aversion and/or reactance is lower.

One potential limitation of this research is that the emotional state is not directly associated with the warning message. For instance, guilt and shame are frequently evoked in antidrinking messages (Agrawal & Duhachek, 2010; Duhacheck et al., 2012). Since it is more difficult to predict incidental emotional states, our results are limited to situations where consumers are in the emotional-temporal focus orientation of hope or pride, and/or to a specific strategy that prime these emotions as an antecedent to the warning information.

The message framing literature is very extensive, but there is no established evidence of the relationship between hope and preference for specific message frames. We found initial evidences, but additional research is needed to fully address this issue.

It would be interesting to investigate our findings with a natural target group that is confronted with real risky situations, and also in other domains beyond those of health-care warning messages, such as financial investments.

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## APPENDIX A

### Writing Task Instructions – Study 1

#### ***Condition: Hope***

Neste momento, gostaríamos que você pensasse em alguma situação que faça você se sentir esperançoso por algo que deseje que aconteça com você em algum momento da sua vida no futuro.

Pensando nesta situação futura de esperança, escreva nas próximas linhas sobre esta situação com o máximo de detalhes possível (texto com no mínimo 2 linhas). Procure descrever a situação de modo que se alguém a lesse também se sentiria esperançoso(a) apenas por saber da situação. Como é estar nesta situação? Que motivos faz você sentir esperança de que esta situação possa realmente se concretizar de forma positiva para você no futuro?

NOTA: A esperança é uma emoção positiva que resulta da possibilidade de conquistar algo que se deseja. Exemplos de situações que você pode escrever sobre: se formar e conseguir um emprego, se casar e começar uma família, você ou um ente querido se recuperar de uma doença, resolver algum conflito com um amigo, etc.

#### ***Condition: Pride***

Neste momento, gostaríamos que você pensasse em alguma situação que faça você se sentir orgulhoso(a) por algo que já aconteceu com você em algum momento da sua vida no passado.

Pensando nesta situação passada de orgulho, escreva nas próximas linhas sobre esta situação com o máximo de detalhes possível (texto com no mínimo 2 linhas). Procure descrever a situação de modo que se alguém a lesse também se sentiria orgulhoso(a) apenas por saber da situação. Como é estar nesta situação? Que motivos faz você sentir orgulho por esta situação que ocorreu com você no passado?

NOTA: O orgulho é uma emoção positiva que resulta da conquista de algo importante para si. Exemplos de situações que você pode escrever sobre: ter sido aprovado para entrar na faculdade, ter conseguido um emprego, ter se recuperado de uma doença, ter conquistado algum bem material por mérito próprio, etc.

#### ***Condition: Neutral***

Neste momento, gostaríamos que você pensasse na atividade de lavar louças.

Imagine que você está sendo solicitado para demonstrar como é executar esta atividade de lavar louças neste exato momento e, além disso, você precisa escrever um passo-a-passo deste procedimento, com o máximo de detalhes possível (texto com no mínimo 2 linhas). Procure descrever esta atividade de modo que se alguém a lesse também conseguiria lavar



louças exatamente como você descreveu. Se você nunca parou para pensar nisso, a hora é esta! Qual é o seu método?

NOTA: Etapas do processo de lavar louças podem incluir retirar a sujeira com um papel toalha previamente, esfregar todas as louças primeiro, e depois enxaguar todas juntas, ou deixar algumas louças de molho na água para que a sujeira saia mais facilmente, tipo de esponja e detergente utilizados, uso de luvas e água quente, deixar as louças num escurridor ou enxugar com pano de prato, etc.

### **Writing Task Instructions – Studies 2 and 4**

#### ***Condition: Hope***

At this moment, we would like you to think of some situation in your life that makes you feel hopeful for something you want but has not achieved yet.

Thinking about this situation of hope, write in the next lines about this situation with as much detail as possible (text with at least 3 lines). Describe the situation so that if someone reads, will also feel hopeful just by knowing the situation.

What does it feel like to be in this situation? What reasons do you feel hopeful about this situation?

NOTE: Hope is a positive emotion that results from the possibility to achieve something you desire.

#### ***Condition: Pride***

At this moment, we would like you to think of some situation in your life that makes you feel proud of something you have done.

Thinking about this situation of pride, write in the next lines about this situation with as much detail as possible (text with at least 3 lines). Describe the situation so that if someone reads, will also feel proud just by knowing the situation.

What does it feel like to be in this situation? What reasons do you feel proud about this situation?

NOTE: Pride is a positive emotion that results from the achievement of something important to yourself.

**Condition: Neutral**

At this moment, we would like you to think about the steps of doing laundry.

Thinking about this situation of your routine, write in the next lines about the process of doing laundry with as much detail as possible (text with at least 3 lines). Describe the situation so that if someone reads, will also imagine this process of your routine.

NOTE: The steps of doing laundry can include measuring detergent, finding the correct setting on the washing machine, etc.

**Writing Task Instructions – Study 3**

***Conditions: Future [emotion absent] and (emotion present)***

Neste momento, gostaríamos que você “viajasse no tempo” e pensasse em [como estará sua vida] (algo que tenha esperança que aconteça na sua vida) daqui a mais ou menos 1 ano.

Pensando nesta [realidade futura da] (situação futura que deseja para) sua vida, escreva\* nas próximas linhas sobre o que você pensou, com o máximo de detalhes possível.

NOTA. Você pode escrever sobre: [como você estará fisicamente, que tipo de roupas estará usando, onde estará morando, coisas que gostará de fazer, etc.] (se formar e conseguir um emprego, se casar e começar uma família, você ou um ente querido se recuperar de alguma dificuldade, resolver algum conflito com um amigo, etc.)

\* Texto com no mínimo 2 linhas. Inicie seu texto com “Daqui a mais ou menos 1 ano...”

***Conditions: Past [emotion present] and (emotion absent)***

Neste momento, gostaríamos que você “viajasse no tempo” e pensasse em [como estava sua vida] (algo que tenha orgulho que aconteceu na sua vida) há mais ou menos 1 ano.

Pensando nesta [realidade passada da] (situação passada que se orgulha na) sua vida, escreva\* nas próximas linhas sobre o que você pensou com o máximo de detalhes possível.

NOTA. Você pode escrever sobre: [como você estava fisicamente, que tipo roupas usava, onde morava, coisas que gostava de fazer, etc.] (ter sido aprovado para entrar na faculdade, ter conseguido um estágio/emprego, ter se recuperado de alguma dificuldade, ter conquistado algum bem material por mérito próprio, etc.)

\* Texto com no mínimo 2 linhas. Inicie seu texto com “Há mais ou menos 1 ano...”

## APPENDIX B

### STDs Warning Ad – Studies 1 and 3

Preservativo serve para mais do que prevenir gravidez indesejada 

**Você já pensou nisso?**

 Nos últimos anos, o Brasil registrou um aumento na disseminação de doenças sexualmente transmissíveis (DSTs), devido a uma diminuição do uso de preservativos. Segundo dados do Ministério da Saúde, apenas 56,6% dos jovens usam preservativo.

É muito importante lembrar que, além de evitar uma gravidez não planejada, o preservativo impede o contágio de DSTs como sífilis, clamídia, gonorréia e HIV.

O preservativo é um dos métodos mais seguros para a prevenção das DSTs.  
**Previna-se. Use preservativo.**

### Hepatitis Warning Ad – Study 2

Five million Americans have **hepatitis.**  
Do you?

The hepatitis virus are more common and can be more infectious than the Aids virus. Yellowing of the skin or eyes can signal hepatitis, although most people have no recognizable signs or symptoms. Untreated, hepatitis can lead to cirrhosis (scarring) of the liver, liver cancer and liver failure.

You are at high risk for hepatitis if you have been exposed to infected blood or body fluids through unprotected sex, tattooing and body piercing. Even kissing, sharing razors or toothbrushes, and getting a manicure puts you at risk. Your doctor can do specific tests to diagnose hepatitis. Get tested, in many cases, hepatitis can be treated.

**Get tested.**  
If you suspect you are at risk, see your doctor or call the AMERICAN LIVER FOUNDATION for free information.  
**1-800-465-4837**



*Skin Cancer Warning Ad/ Loss Frame – Study 4*



**Avoid damages to your skin and your life**

If you don't wear sunscreen everyday, you will be vulnerable to skin cancer. Don't be careless, living sick is much more difficult.



**WEAR SUNSCREEN**  
.....  
[www.cdc.gov](http://www.cdc.gov)



*Skin Cancer Warning Ad/ Gain Frame – Study 4*



**Have a healthy skin and a longer life**

If you wear sunscreen everyday, you will be protected from skin cancer. Be smart, living healthy is much more pleasurable.



**WEAR SUNSCREEN**  
.....  
[www.cdc.gov](http://www.cdc.gov)



**Hepatitis Warning Ad/ Loss Frame – Study 4**

## Avoid damages to your liver and your life



The hepatitis virus is more common and infectious than the AIDS virus. Yellowing of the skin or eyes can be a sign of hepatitis, although most people have no recognizable signs or symptoms.

Untreated, hepatitis can cause serious damage to your liver. Don't be careless, living sick is much more difficult.

**GET TESTED**

[www.liverfoundation.org](http://www.liverfoundation.org)



**Hepatitis Warning Ad/ Gain Frame – Study 4**

## Have a healthy liver and a longer life



The hepatitis virus is more common and infectious than the AIDS virus. Yellowing of the skin or eyes can be a sign of hepatitis, although most people have no recognizable signs or symptoms.

With early detection, hepatitis can be treated and your liver preserved. Be smart, living healthy is much more pleasurable.

**GET TESTED**

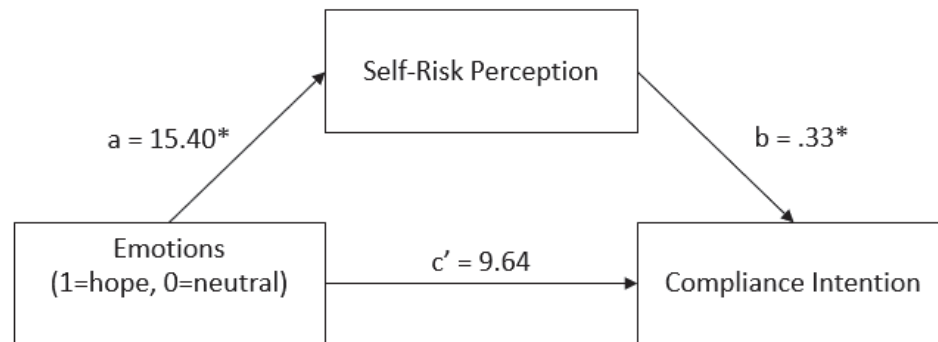
[www.liverfoundation.org](http://www.liverfoundation.org)



## APPENDIX C

### Additional Analysis – Study 1

**Hope (vs. Neutral) Mediation Analysis.** Following Preacher and Hayes (2004), the mediation analysis was tested through bootstrapping. A 95% confidence interval (CI) of the parameter estimates was obtained by running the resampling 10,000 times. The incidental emotion, our independent variable, was coded as 1 = hope and 0 = neutral. To test several paths of mediation, we used model 4 of Hayes (2013) process macro. The mediation analysis was conducted to evaluate the indirect effect of emotions upon compliance intention through self-risk perception. The results indicate that self-risk perception mediation was significant for the pairwise comparison between hope vs. neutral ( $Coef = 5.131$ ;  $CI = .310$  to  $12.038$ ), as shown in figure below.



NOTE. – \*  $p < .05$ .

**Figure – The mediating role of self-risk perception between emotions (hope vs. neutral) and compliance intention (study 1)**

The figure shows a positive impact of hope on self-risk perception ( $Coef = 15.40$ ;  $CI = 1.196$  to  $29.603$ ). Self-risk perception also had a positive impact on consumers' compliance intention ( $Coef = .33$ ;  $CI = .136$  to  $.530$ ). The expected indirect effect of self-risk perception between emotions and compliance intention was statistically significant (indirect effect =  $5.13$ ,  $95\% CI = .310$  to  $12.038$ ). There was no direct effect of emotions on compliance intention (direct effect =  $9.64$ ;  $CI = -2.308$  to  $21.589$ ).