

How does the visual aesthetics of positively-framed messages impact their motivational capacity?

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ABSTRACT

Many people nowadays engage with motivational text messages embedded in a visual presentation. However, empirical studies of the impact of textual messages on users' motivation to exercise have paid little attention to how their visual appeal impacts their motivational capacity. We conducted an online experiment to explore the impact of visual aesthetics on the motivational capacity of positively-framed textual messages. Participants were assigned to three conditions: positively-framed messages a) presented as text-only (no-aesthetics), b) presented with high visual appeal (beautiful), and c) presented with low visual appeal (ugly). Contrary to our expectations, the perceived visual appeal of a message show no impact on its motivational capacity in terms of how motivating it was perceived to be, nor on extrinsic identified behavior regulation. The implications of these results on the design of interactive systems, and physical activity trackers in particular, are discussed herein.

CCS CONCEPTS

• *Human-centered computing~Empirical studies in HCI*

KEYWORDS

Visual aesthetics, motivational text messages, exercise motivation, physical activity

ACM Reference format:

Lígia Duro, Teresa Romão, Evangelos Karapanos and Pedro F. Campos. 2019. How does the visual aesthetics of positively-framed messages impact their motivational capacity?. In *Proceedings of 31st European Conference on Cognitive Ergonomics (ECCE 2019), September 10-13, 2019, BELFAST, United Kingdom*. ACM, New York, NY, USA, 6 pages. <https://doi.org/10.1145/3335082.3335085>

1 Introduction

Many people nowadays engage with visual quotes – motivational text messages embedded in a visual presentation [2, 4]. However, studies in Human-Computer Interaction related to the motivational capacity of text messages have paid little attention to this phenomenon. For instance, in the context of physical activity promotion, we found multiple studies focused on factors related to the development of textual content [6, 14, 18, 19, 34] and its effectiveness in motivating individuals to increase their physical activity levels [3, 6] or their intention to exercise [21, 31], but none exploring how visual aesthetics impact the motivating capability of motivational text messages. Visual aesthetics, defined as the pleasurable appearance of things [28] or as an emotional aspect of user experience [10, 20], has long been an object of study in the Human-Computer Interaction field (HCI) [8, 9]. Research has found that visual aesthetics influence not only global judgments of product quality but also influences other perceived product qualities (e.g., perceived usability) [7]. Nonetheless, to our knowledge, no study in HCI has explored how visual aesthetics influences the motivational capacity of visual quotes. However, commercial activity tracking services such as Runkeeper have long exploited the role of visual aesthetics in the provision of motivational text messages mostly through social media channels (e.g., primarily Instagram, but also Facebook and Twitter).

This paper explores the influence of visual aesthetics (i.e., beautiful, ugly and no visual presentation) on exercise

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ECCE 2019, September 10-13, 2019, BELFAST, United Kingdom

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ACM ISBN 978-1-4503-7166-7/19/09...\$15.00

<https://doi.org/10.1145/3335082.3335085>

motivation, and particularly the extrinsically identified behavior regulation that is linked to the initial adoption of exercise [26]. We conducted an experiment with three conditions: positive-framed messages presented as text-only, positive-framed messages within perceived beautiful visual presentations, and positive-framed messages within perceived ugly visual presentations. As opposed to what researchers expected, the perception of beauty or ugliness did not impact the motivating capability of positive-framed text messages. The results are discussed in the context of HCI focused on activity tracker services.

2 Background

Researchers have been exploring several factors in the development of motivational text messages in the context of physical activity, with the ultimate goal of having a better chance of stimulating behavioral change. For instance, researchers have studied gain- versus loss-framed messages [31], messages tailored to personality [32], gender [32], behavior change stages [33], self-efficacy [13], differences in the motivational capability of text messages created by experts and peers [34], and source credibility [11].

All in all, these studies show that several factors can influence the efficiency of motivational text messages in increasing exercise motivation. Gain-framed messages (focused on the gains of having a healthy behavior) can result in stronger intentions to be physically active than loss-framed messages (focused on the losses associated with unhealthy behavior) [31]. Messages are perceived as more or less motivating depending on personality traits such as openness, extraversion, and agreeableness, and gender also plays a role in how motivational text messages are perceived [32]. Motivational text messages are perceived as more motivating when individuals are in later stages of change [33] and can impact individuals' beliefs as they relate to their ability to achieve their exercise goals (self-efficacy) [13]. Expert-designed messages are more motivating to individuals in the earliest behavioral change stages, while peer-designed messages are perceived as more motivating to individuals that are in later behavioral change stages [34]. Positive-framed messages from a credible source can help to positively influence exercise intentions [11].

A recent early-stage study [30] found that motivational text messages can increase physical activity levels most likely due to their impact on the type of motivation linked to the initial adoption of exercise [26] (on extrinsic identified behavior regulation). In the study, which lasted one and a half months, participants, after being subject to intervention by motivational text messages, presented an increase in their extrinsically identified behavior regulation. Following the self-determination theory [22, 23], the extrinsic identified behavior regulation is characterized by being a behavior relatively self-determined. It refers to behaviors that derive from the conscious valuing of an activity in which the individual already identifies itself with a behavior's value. However, the individual's behavior is still extrinsically motivated because it is still instrumental. For

example, the individual exercises to be healthy rather than being guided by the activity's inherent interest (e.g. enjoyment). A systematic review concluded that identified behavior regulation could predict short-term exercise adherence [26].

On the other hand, the study of visual aesthetics in HCI, as defined as the beauty or pleasing appearance of things [28], is a non-instrumental quality of the user experience with a system [10] that can influence users' perception about other product attributes (e.g. usability) [29]. Nonetheless, there are some inconsistencies in the findings, which is likely to happen due to differences in the study of beauty [7].

Research in the field of functional magnetic resonance imaging (fMRI) has also supported the claim that aesthetic experiences are not only associated with reflective thought, but also with affective responses [15, 20]. The aesthetic experience both informs and is a result of aesthetic emotions [25]. It is the generated positive affect that is thought to influence human cognitive processes [12, 20] and is "likely to spill over to other attributes" of the product [7, 20]. In other words, it is likely that when an individual perceives an object as beautiful, they will feel more positive in general (beauty leads to a positive emotional response). This positive affect, in turn, will make individuals perceive other attributes of a product more favorably. A similar effect has been shown (for example) in a study from Forgas and Bower [5] in which happy subjects formed more favorable impressions and made more positive judgments than sad subjects.

Following the significant influence that visual aesthetics can have on the overall likeability of a product, researchers were particularly interested in exploring how visual aesthetics impact the motivating capability of the textual content of a motivational text message.

3 Methods

The goal of this study was to explore how aesthetically appealing visual presentations impact the motivating capability of positive-framed text messages in the context of physical activity. The study focused on how alterations in the perception of beauty impact the assessment of textual content. Since we were interested in the effect of perception, we were unable to confirm before the start of the study whether the participants would perceive a certain visual presentation as beautiful, neutral, or ugly, and thus assign them to conditions. Therefore, participants started by being randomly assigned to one of the visual stimuli, presented in Table 1 (to A.1, A.2, B.1, or B.2). After data analysis, participants that received the stimulus A.1 or A.2 were assigned to condition a) no-aesthetics. Participants who received the stimulus B.1 or B.2 were split considering their assessment of aesthetic pleasure regarding the visual stimulus. Participants assigned to stimulus B.1 or B.2 who assessed the visual presentation as positive regarding aesthetics were assigned to condition b) positive aesthetics, and participants who assessed the visual presentation as negative regarding aesthetics were assigned to condition c) negative aesthetics.

The target population of this study was sedentary young adults. To reach the target population, the survey started with a closed-ended screening question regarding exercise habits: “Which statement best describes how often you exercise?” Participants were invited to participate in the study if their answer was “I never exercise.” Individuals who reported doing some physical activity were disqualified from the study.

Procedure and measurements. First, participants were asked to assess how motivating or demotivating they found the message presented to them on a Likert-scale (7-point, from extremely demotivating to extremely motivating). Participants that received the stimulus B.1 or B.2 were after asked to assess the aesthetic pleasure from the visual presentation using the Aesthetic Pleasure in Design scale [1]. Next, the identified behavior regulation in all cases of participants was measured

using BREQ-3 scale [17, 35], ending with demographic questions (age, gender, nationality, education).

Material. The messages used in the study were extracted from the appendices of a study by Riet and colleagues [31] that investigated message-framing effects in the context of a tailored intervention promoting physical activity. In their study, the conclusions showed that gain-framed messages resulted in stronger intentions to be physically active than loss-framed messages. The visual presentations were created by author 1 of this paper and were selected based on the results of exploratory pre-studies (with between eight to eleven participants), where several different visual presentations were presented to participants and participants were asked to assess the visual presentation regarding aesthetic pleasure using the Aesthetic Pleasure in Design scale [1].

Table 1: Stimuli used in the experiment.

A - POSITIVE FRAMED MESSAGES

- A.1. When you are active, you burn a lot of calories. This can help you become more slender.
A.2. When you are active, you will be stronger and have better stamina, something to be proud of!

B – POSITIVE FRAMED MESSAGES WITH AESTHETICS

*When you are
active, you will be
stronger and have
better stamina,
something to be
proud of!*

B.1.

*When you are
active, you burn a
lot of calories.
This can help you
become more
slender.*

B.2.

Participants. Participants were recruited using Amazon Mechanical Turk, and all of them had a HIT (tasks) approval rate greater than 99%. Each participant was compensated with \$0.40. The time assigned to the task was 4 minutes, and participants took on average of 76 seconds (standard deviation = 61 seconds) to answer to the questionnaire. Initially a total of 951 responses were recorded. One hundred and nine individuals passed the screening question by reporting that they never exercised, and thus were invited to participate in the study.

4 RESULTS

Participants characterization. 109 sedentary adults participated in the experiment. Due to nationality outside of the US, 12 individuals were disqualified from the study, leaving a total of 97 participants. 38 were men (39 %) and 59 were women (61%). The

sample’s median age was 30 years (min. = 18, max. = 60). Around half of the participants held a bachelor’s degree (51%) followed by 19% holding a graduate or professional degree. The percentage of participants with an associate degree (11%) was the same as those who reported having some college but no degree. Around 5% of the participants reported being high school graduates (including equivalency). Only 2% held a Ph.D. and only 1% of the participants had less than a high school degree.

Aesthetics assessment. In Figure 1 we show a histogram with the aesthetic pleasure assessment values. The majority of the assessments of the visual presentation were positive or negative, following the Aesthetic Pleasure in Design scale [1], with 0 being extremely ugly and 7 being extremely beautiful. Three conditions were created from the results.

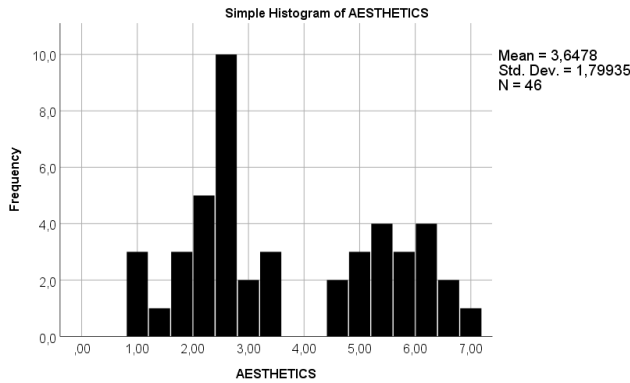


Figure 1: Histogram of aesthetics assessment scores.

Final conditions of the study. The three final conditions of the study were: (a) no-aesthetics (text-only messages), (b) positive aesthetics, and (c) negative aesthetics. 51 participants were assigned to condition (a), 27 to condition (b), and 19 to condition (c).

4.1 Research Questions

The main research question answered in this study was, “How do visual aesthetics influence the motivating capability of positive-framed text-messages?”

To answer this question, we divided it into two sub-questions.

RQ1: Is there a difference in perceiving how motivating a positive-framed text message is according to its visual presentation: (a) as text-only, (b) embedded in perceived aesthetically appealing visual presentations, and (c) embedded in perceived aesthetically unappealing visual presentations?

RQ2: Is there a difference in the impact of positive-framed text messages in the extrinsic identified behavior regulation according to the message’s visual presentation: (a) as text-only, (b) embedded in perceived aesthetically appealing visual presentations, and (c) embedded in perceived aesthetically unappealing visual presentations?

4.1.1 Research Question 1 Results. To answer research question 1, in which there was an ordinal independent variable (with three aesthetics categories), and an ordinal dependent variable (how motivating is the message, measured on a 7-point Likert scale), a rank-based nonparametric Kruskal-Wallis H test was conducted.

A Kruskal-Wallis H test was performed to determine if there were differences in how the message was perceived as motivating between three groups of participants that differed in their levels of perceived aesthetic pleasure: the “text-only visual presentation” (n=51), “positive aesthetics” (n=27) and “negative aesthetics” (n=19) level groups.

Distributions of perceived aesthetic pleasure scores were not similar for all groups, as assessed by visual inspection of a boxplot (Figure 2). The mean rank of perceived aesthetic pleasure scores was not statistically significantly different between groups, $X^2(2) = 0.033$, $p = .984$.

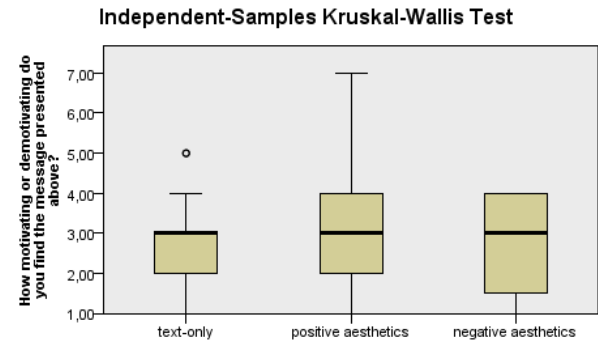


Figure 2: Distributions of perceived aesthetic pleasure scores in each condition.

4.1.2 Research Question 2 Results. Question 2 investigated if there were statistically significant differences between three groups of an independent variable (perceived aesthetic pleasure) on a continuous dependent variable (extrinsic identified behavior regulation following the scale BREQ-3 [17, 35]). To test this, the Kruskal-Wallis H test, a rank-based nonparametric test, was carried out.

The Kruskal-Wallis H test was performed to determine if there were differences in extrinsic identified behavior regulation score between three groups of participants with different perceived aesthetic pleasure: the “text-only,” “positive aesthetics,” and “negative aesthetics” level groups.

Distribution of extrinsic identified regulation was similar for all groups, as assessed by visual inspection of a boxplot (Figure 3). Median extrinsic identified regulation scores were not statistically significantly different between groups, $X^2(2) = 2.245$, $p = .325$.

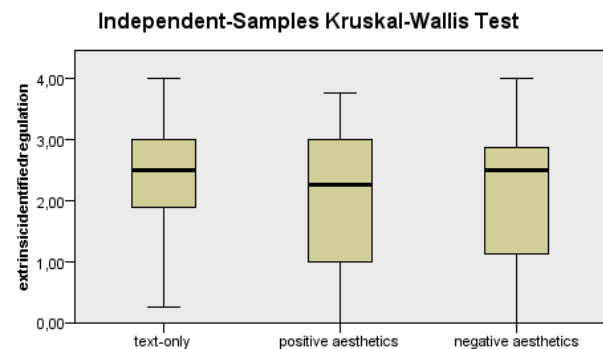


Figure 3: Distributions of extrinsic identified behavior regulation scores in each condition.

5 DISCUSSION, LIMITATIONS, AND CONCLUSION

Visual aesthetics (the beauty or pleasing appearance of things) can influence users’ perception of product attributes, such as usability [29]. However, while nowadays many people see motivational text messages embedded in a visual presentation [2,

4], HCI studies related to motivational text messages have not studied the impact of the visual aesthetics dimension on the motivating capability of motivational text messages. This study was focused on studying the impact of the perception of beauty and ugliness on the motivating capability of positive-framed text messages in the context of physical activity.

Results showed that, independently of perceiving a visual presentation as beautiful or ugly, the visual aesthetics did not impact subjects' assessment of positive-framed text messages' motivating capacities. Moreover, perceiving a visual presentation as beautiful or ugly also did not change the motivating capability of positive-framed text messages presented as text-only in the extrinsic identified behavior regulation [30]. These results were not expected due to the positive effects reported by studies regarding the influence of visual aesthetics in the general evaluation of products [16, 24, 27].

The main limitation of the study was the nature of studying perception; it was not possible to assign the subjects of the study to all defined conditions beforehand, since we did not know who or how many participants would perceive a visual presentation as beautiful or ugly. Therefore, participants were assigned to conditions only in the data analysis. Another significant limitation was the number of participants on each condition, which researchers could not fully control.

In conclusion, according to our study, aesthetically appealing visual presentations do not impact the perceived motivating capability of positive-framed messages directly. Assuming users of activity tracking services would be looking for a boost of extra motivation, the presence of aesthetically appealing visual presentations would not impact their perception regarding how motivating the text messages are. The development of the textual content in this scenario is a crucial part of a product feature focused on providing motivational text messages to impact the exercise motivation of individuals. On the other hand, it remains undetermined as to whether aesthetic appeal can help activity tracking services, in terms of engaging their users with this kind of feature. In other words, it is possible that aesthetic appeal can help to instigate a positive feeling regarding the text over time. Regarding future work, we note that this study did not explore the impact of using imagery as background in the visual presentations of motivational text messages, it may be that imagery (as part of the visual dimension of the visual presentation of motivational text messages) has an impact in exercise motivation.

ACKNOWLEDGMENTS

This research was funded by ARDITI – Agência Regional para o Desenvolvimento da Investigação Tecnológica e Inovação, Madeira Island, Portugal, under the support of the Project M1420 - 09-5369-FSE-000001 – Ph.D. scholarship;

REFERENCES

- [1] Blijlevens, J. et al. 2017. The Aesthetic Pleasure in Design Scale: The development of a scale to measure aesthetic pleasure for designed artifacts. *Psychology of Aesthetics, Creativity, and the Arts*. 11, 1 (2017), 86–98. DOI:https://doi.org/10.1037/aca0000098.
- [2] Coccozza, P. 2014. Read this and feel better – how inspirational guff invaded our lives. *The Guardian*.
- [3] Connelly, K. and Mutsuddi, A.U. 2012. Text Messages for Encouraging Physical Activity. *PervasiveHealth*. (2012), 33–40. DOI:https://doi.org/10.4108/icst.pervasivehealth.2012.248715.
- [4] Dean Burnett 2014. Motivational posters: do they actually work? *The Guardian*.
- [5] Forgas, J.P. and Bower, G.H. 1987. Mood effects on person-perception judgments. *Journal of personality and social psychology*. 53, 1 (1987), 53–60. DOI:https://doi.org/10.1037/0022-3514.53.1.53.
- [6] Gouveia, R. et al. 2015. How do we engage with activity trackers?: a longitudinal study of Habito. *Proceedings of the 2015 ACM International Joint Conference on Pervasive and Ubiquitous Computing*. SEPTEMBER (2015), 1305–1316. DOI:https://doi.org/10.1145/2750858.2804290.
- [7] Hassenzahl, M. 2008. Aesthetics in interactive products: Correlates and consequences of beauty. *Product Experience*. 287–302.
- [8] Hassenzahl, M. 2001. The Effect of Perceived Hedonic Quality on Product Appealingness. *International Journal of Human-Computer Interaction*. 13, 4 (2001), 481–499. DOI:https://doi.org/10.1207/S15327590IHC1304_07.
- [9] Hassenzahl, M. 2004. The Interplay of Beauty, Goodness, and Usability in Interactive Products. *Human Computer Interaction*. 19, 4 (2004), 319–349. DOI:https://doi.org/10.1207/s15327051hci1904_2.
- [10] Hassenzahl, M. and Tractinsky, N. 2006. User experience - A research agenda. *Behaviour and Information Technology*. 25, 2 (2006), 91–97. DOI:https://doi.org/10.1080/01449290500330331.
- [11] Jones, L.W. et al. 2003. ... Effects of Source Credibility and Message Framing on Exercise Intentions, Behaviors, and *Journal of Applied Social Psychology*. (2003), 179–196.
- [12] Jung, N. et al. 2014. How emotions affect logical reasoning: evidence from experiments with mood-manipulated participants, spider phobics, and people with exam anxiety. *Frontiers in Psychology*. 5, (2014). DOI:https://doi.org/10.3389/fpsyg.2014.00570.
- [13] Latimer, A.E. et al. 2010. A systematic review of three approaches for constructing physical activity messages: What messages work and what improvements are needed? *International journal of behavioral nutrition and physical activity*. (2010).
- [14] Latimer, A.E. et al. 2010. A systematic review of three approaches for constructing physical activity messages: What messages work and what improvements are needed? *The international journal of behavioral nutrition and physical activity*. 7, (May 2010), 36. DOI:https://doi.org/10.1186/1479-5868-7-36.
- [15] Leder, H. and Nadal, M. 2014. Ten years of a model of aesthetic appreciation and aesthetic judgments: The aesthetic episode - Developments and challenges in empirical aesthetics. *British Journal of Psychology*. 105, 4 (2014), 443–446. DOI:https://doi.org/10.1111/bjop.12084.
- [16] Lindgaard, G. et al. 2006. Attention web designers: You have 50 milliseconds to make a good first impression! *Behaviour & Information Technology*. 25, 2 (2006), 115–126. DOI:https://doi.org/10.1080/01449290500330448.
- [17] Markland, D. and Tobin, V. 2004. A Modification to the Behavioural Regulation in Exercise Questionnaire to Include an Assessment of Amotivation. *Journal of Sport and Exercise Psychology*. (2004). DOI:https://doi.org/10.1123/jsep.26.2.191.
- [18] Munson, S. 2012. Mindfulness, Reflection, and Persuasion in Personal Informatics. *CHI 2012 Workshop*. (2012), 4.
- [19] Noar, S.M. et al. 2007. Does Tailoring Matter? Meta-Analytic Review of Tailored Print Health Behavior Change Interventions. *Psychological Bulletin*. 133, 4 (2007), 673–693. DOI:https://doi.org/10.1037/0033-2909.133.4.673.
- [20] Norman, D.N. 2004. *Emotional Design - Why we love (or hate) everyday things*.
- [21] Notthoff, N. et al. 2016. Positive messages enhance older adults' motivation and recognition memory for physical activity programmes. *European journal of ageing*. 13, 3 (Mar. 2016), 251–257. DOI:https://doi.org/10.1007/s10433-016-0368-1.
- [22] Ryan, R.M. et al. 2009. Self-determination theory and physical activity: the dynamics of motivation in development and wellness. *Hellenic Journal of Psychology*. 6, (2009), 107–124. DOI:https://doi.org/10.1080/17509840701827437.
- [23] Ryan, R.M. and Deci, E.L. 2000. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*. 55, 1 (2000), 68–78. DOI:https://doi.org/10.1037/0003-066X.55.1.68.
- [24] Schenkman, B.N. and Jönsson, F.U. 2000. Aesthetics and preferences of web pages. *Behaviour & Information Technology*. 19, 5 (2000), 367–377. DOI:https://doi.org/10.1080/014492900750000063.
- [25] Schindler, I. et al. 2017. Measuring aesthetic emotions: A review of the literature and a new assessment tool. *PLoS ONE*.
- [26] Teixeira, P.J. et al. 2012. Exercise, physical activity, and self-determination theory: A systematic review. *International Journal of Behavioral Nutrition and Physical Activity*. 9, 1 (Jun. 2012), 1. DOI:https://doi.org/10.1186/1479-5868-9-78.

- [27] Tractinsky, N. et al. 2006. Evaluating the consistency of immediate aesthetic perceptions of web pages. *International Journal of Human Computer Studies*. (2006). DOI:<https://doi.org/10.1016/j.ijhcs.2006.06.009>.
- [28] Tractinsky, N. Visual Aesthetics. *The Encyclopedia of Human-Computer Interaction, 2nd Ed.* Interaction Design Foundation.
- [29] Tractinsky, N. et al. 2000. What is beautiful is usable. *Interacting with Computers*. 13, 2 (2000), 127–145. DOI:[https://doi.org/10.1016/S0953-5438\(00\)00031-X](https://doi.org/10.1016/S0953-5438(00)00031-X).
- [30] Tseng, Y.-C. et al. 2018. The Different Effects of Motivational Messages and Monetary Incentives on Fostering Walking Behavior. *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems*. (2018), LBW017:1--LBW017:6. DOI:<https://doi.org/10.1145/3170427.3188670>.
- [31] Van't Riet, J. et al. 2010. Investigating message-framing effects in the context of a tailored intervention promoting physical activity. *Health Education Research*. 25, 2 (2010), 343–354. DOI:<https://doi.org/10.1093/her/cyp061>.
- [32] de Vries, R.A.J. et al. 2017. A word of advice: how to tailor motivational text messages based on behavior change theory to personality and gender. *Personal and Ubiquitous Computing*. 21, 4 (2017), 675–687. DOI:<https://doi.org/10.1007/s00779-017-1025-1>.
- [33] de Vries, R.A.J. et al. 2016. Crowd-Designed Motivation. *Proceedings of the 2016 CHI Conference on Human Factors in Computing Systems - CHI '16* (2016), 297–308.
- [34] de Vries, R.A.J. et al. 2017. Experts Get Me Started, Peers Keep Me Going: Comparing Crowd- Versus Expert-designed Motivational Text Messages for Exercise Behavior Change. *Proceedings of the 11th EAI International Conference on Pervasive Computing Technologies for Healthcare*. (2017), 155–162. DOI:<https://doi.org/10.1145/3154862.3154875>.
- [35] Wilson, P.M. et al. 2006. “It’s who I am...really!” The importance of integrated regulation in exercise contexts. *Journal of Biobehavioral Research*. (2006). DOI:<https://doi.org/10.1111/j.1751-9861.2006.tb00021.x>.