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How motivational orientation influences the evaluation and choice of hedonic and pragmatic interactive products: The role of regulatory focus

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ABSTRACT

The perceived quality of interactive products can be roughly divided into instrumental, task-related, pragmatic attributes (e.g., usefulness, usability) and non-instrumental, self-referential, hedonic attributes (e.g., novelty, beauty). Recent studies suggest that the weighting of both aspects in forming an overall evaluation of an interactive product heavily depends on features of the actual situation, such as whether an individual has to perform a specific task or not. The present paper extends these findings by assuming that a match between an individual's motivational orientation and particular product attributes (i.e., pragmatic, hedonic) moderates the perceived value of interactive products. Specifically, it shows how differences in regulatory foci (promotion or prevention focus), that is, differences in the way goal-directed behavior is regulated, influence product evaluation and choice. Participants were either set in a prevention focus (concern for safety and the avoidance of negative outcomes) or promotion focus (concern for personal growth and the attainment of positive outcomes). Subsequently, they were asked to evaluate and choose between a primarily pragmatic and a primarily hedonic mp3-player. The results revealed the expected effect of the activated regulatory focus on evaluation and choice. Individuals in a promotion focus rated the hedonic player as more appealing and chose it more frequently compared to individuals in a prevention focus. Reverse results, albeit not as strong, were found for the evaluation and choice of the pragmatic player. Our findings support the idea that product appeal and choice is strongly context-dependent. It further extends previous findings by showing that not only major differences in the situation, such as providing a specific task or not, impact product appreciation but that more subtle, motivational orientations can have similar effects.

1. Introduction

People perceive and evaluate interactive products along two different dimensions: *pragmatic* and *hedonic* quality (e.g., Hassenzahl, 2003; Batra and Ahtola, 1990). Pragmatic quality refers to the product's perceived ability to support the achievement of "do-goals," such as "making a telephone call," "finding a book in an online-bookstore" or "setting-up a webpage". In contrast, hedonic quality refers to the product's perceived ability to support the achievement of "be-goals," such as "being competent," "being related to others," "being special" (see Carver and Scheier, 1989 for more on "do-goals" and "be-goals"). Pragmatic quality calls for a focus on the product – its utility and usability in relation to a given task. It is about *how* one achieves a specific goal. Hedonic quality, however, calls for a focus on the Self, i.e., the question of *why* someone owns and uses a product. Here, more general human needs beyond the instrumental come into play, such as a need for novelty and change, personal growth, self-expression and/or relatedness (see Rokeach, 1973; Ryan and Deci, 2000; Schwartz and Bilsky, 1987; Sheldon et al., 2001 for general lists of human needs and values).

In the context of interactive products, Hassenzahl (2003) distinguishes three different key drivers of hedonic quality: *Stimulation* (i.e., novelty and change, personal growth), *identification* (i.e., communication of identity to relevant others, relatedness) and *evocation* (i.e., keeping of memories, symbolizing) (see Malone, 1984; Logan et al., 1994; Jordan, 2000; Gaver and Martin, 2000 for alternative concepts). It is further assumed that people have implicit notions of the relation between particular product attributes (e.g., *simple–complex, ordinary–novel*) and pragmatic or hedonic quality, respectively (see Huffman and Houston, 1993; Reynolds and Olson, 2001). Simplicity, for example, may signal high pragmatic quality, whereas novelty may suggest high hedonic quality. Or to put it differently: Simplicity suggests the fulfillment of do-goals, whereas novelty suggests the fulfillment of be-goals.

Recent findings show that pragmatic and hedonic quality are perceived as unrelated. Furthermore, *both* contribute to the per-

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ceived overall value of a product (Hassenzahl et al., 2000; Hassenzahl, 2001). However, these studies tend to average across products and situations and, thus, do not account for contextual influences on product evaluation. In contrast, we assume that the relative weights of pragmatic and hedonic quality in forming an overall evaluation of a product are dependent on the context of evaluation (see Hartmann et al., 2007; Hassenzahl, 2003).

For instance, Hartmann and colleagues (2007) demonstrated the general context-dependency of preferences for Web sites. Students were told to have a look at three different HCI and design-related Web sites for either deciding for a summer internship or their Ph.D. research. A number of participants changed their preferences depending on the scenario. The majority indicated that the look and feel (i.e., hedonic) of the Web site was the most important attribute in the summer internship scenario, whereas the content of the Web site (i.e., pragmatic) was much more important for the Ph.D. research. A study by Hassenzahl et al. (2002) demonstrated that whether people have concrete do-goals to fulfill with a Web site or not influences the way the Web site is evaluated. Participants were either given tasks to accomplish (e.g., to find a particular information) or were instructed to "just have fun with the Web sites." For the task-group, pragmatic quality (e.g., *simple–complex*) was strongly correlated with the overall evaluation of the Web site (e.g., *good–bad*) (partial correlation = .87), whereas for the fun-group this correlation was not apparent (partial correlation = −.10). In the former case, usability as a product attribute was predictive for the product's overall evaluation, in the latter not. Depending on the context, the weight of usability in judging the overall appeal of the Web site has changed. With a similar manipulation, Rozendaal et al. (2007) found that increasing richness (i.e., complexity, variety, possibilities, that is, hedonic quality) in appearance and interaction with an interactive game resulted in increased engagement (i.e., enjoyment) for a fun-group but not for a task-group. For the latter group especially rich prototypes even created disengagement due to failures to accomplish the task. Moreover, Hassenzahl and Ullrich (2007) found that people in a fun-group base their evaluation of a product predominantly on the amount of spontaneity experienced while interacting, whereas the same aspect was negatively related to the product evaluation in a task-group. For the task-group, mental effort was strongly related to the evaluation of the product (i.e., less experienced mental effort led to a better evaluation of the product), an aspect that was irrelevant for the fun-group. With respect to this, the authors put forward the notion of *mode compatibility*, which is understood as a "compatibility of the way one ought to and actually does approach the product" (p. 436). People with an externally given task focus on the "how", i.e., the do-goal level and, thus, on the pragmatic quality of a product, whereas people without a task may rather focus on the "why", i.e., the be-goal level and, thus, on hedonic aspects.

So far, a number of recent studies demonstrated the context-dependency of product evaluation, i.e., situation-induced differences in the relative weights of particular product attributes. The present paper takes this a step further by showing that similar effects can be obtained by directly manipulating psychological *states* rather than the actual situation. To this end, we refer to the notion of two different *regulatory foci* in goal-directed behavior (Higgins, 1998, 2002). In a *promotion* focus (a particular motivational orientation), individuals are concerned with the presence or absence of positive outcomes. Behavior is motivated by ideals; individuals strive for personal growth and advancement. In a *prevention* focus, individuals attend to the absence or presence of negative outcomes. Behavior is motivated by oughts rather than ideals; individuals look for protection and security. We assume that the perceived value of a product is the consequence of a fit between the product's attributes and the actual regulatory focus. This should be reflected by the situation-dependent weights given to attributes when evaluating or choosing a product.

A study by Safer (1998; cited in Higgins, 2002) provided first evidence for this notion. Individual foci strength was measured before participants were presented with two alternative cars. One car was described as predominantly luxurious (e.g., with plush soft leather seats) and neutral on a reliability dimension; the other was described as predominantly reliable (e.g., antilock brakes) and neutral on the luxury dimension. Safer found that prevention-focused participants, concerned with protection/oughts and seeking to avoid negative outcomes, preferred the reliable over the luxurious car. In contrast, promotion-focused individuals, concerned with advancement/ideals and seeking to gain positive outcomes, preferred the luxurious over the reliable car. Whereas Safer (1998) measured focus strength as a chronic variable, Florack et al. (2005) report a study, where regulatory focus was experimentally induced before participants had to choose between two products: a sun lotion, described as "protecting from sunburn," and a sun lotion stressing a "healthy tan". As predicted, people set in a prevention focus prior to choosing preferred the "protection" sun lotion, whereas people set in a promotion focus preferred the "healthy tan" sun lotion.

The present study attempts to link the notion of pragmatic and hedonic quality as independent aspects of interactive products to regulatory focus. Specifically, we suggest that prevention-focused individuals want to avoid failure and seek products, which offer effective ways to task accomplishment. As a consequence, they put more weight onto the pragmatic quality of a product and, thus, prefer primarily pragmatic products. In contrast, promotion-focused individuals rather concentrate on potential gains, stimulation and personal advancement. As a consequence, they put more weight on the hedonic quality of a product and, thus, prefer primarily hedonic products. To test these assumptions, we induced either a prevention or promotion focus and let participants choose between two different mp3-players. The players were either primarily hedonic or pragmatic. We expected an impact of regulatory focus on choice. In addition, we measured affective quality (Russell, 2003), strength of pragmatic and hedonic quality perceptions (Hassenzahl, 2001), as well as the general value (i.e., appeal) of each player. We expected that participant's perceived value of the mp3-players stems from the fit between regulatory focus and product attributes. In other words, whereas the perception of the product as primarily pragmatic or hedonic remains stable, the evaluation and the affective reactions to the product will be moderated by the regulatory focus.

2. Method

2.1. Participants

The study was conducted as an online experiment. Two-hundred fourteen individuals were invited via an email-list to participate in the study. Of those, 81 were either not responding or terminated the experimental task early. This left 133 responses (response rate: 62%) for further analysis. Participants (42% female, 58% male) had a mean age of 28 years (Min = 15, Max = 67) and used the computer for 32 h the week on average. All participants knew about software-based mp3-players; the majority (44%) indicated frequent use.

2.2. Procedure

After opening the online questionnaire, participants were informed that they participate in a study concerned broadly with the evaluation of software, consisting of a number of unrelated

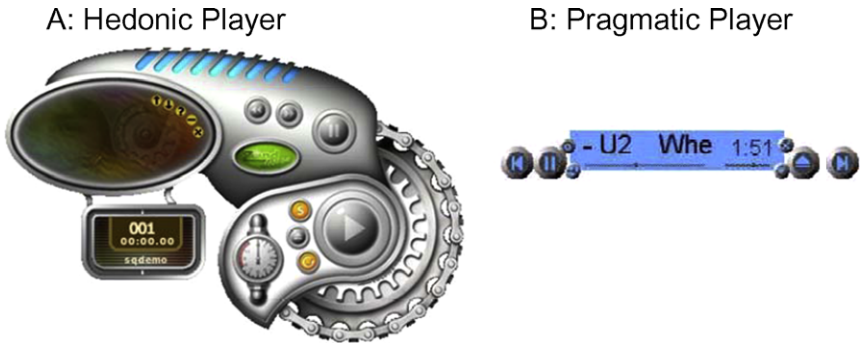

Fig. 1. Mp3-player skins pre-tested as primarily hedonic (A) and primarily pragmatic (B).

tasks. The experiment began with the measurement of the participants' current affective state. Participants then completed a "priming task," designed to induce a particular regulatory focus (promotion, prevention). After that, the current affective state was assessed again as a way to check the successful induction of the focus (i.e., manipulation check). Subsequently, participants were asked in a seemingly unrelated second task to evaluate and choose between two different mp3-players, one primarily hedonic, and the other primarily pragmatic. The affective quality of both players was measured, as well as pragmatic and hedonic quality perceptions, and an overall evaluation. Finally, demographic variables, computer usage and experience with mp3-players were assessed.

2.3. Independent variable: focus induction through a priming task

According to Friedman and Förster (2001) the activation of rudimentary semantics and procedural representations associated with striving for nurturance (promotion focus) or security (prevention focus) are sufficient to induce a particular regulatory focus. Based on this assumption, we confronted our participants with a decision problem in the "priming task". They were asked to imagine that they want to prepare a music compact disc as a birthday present for a good friend. They had only one spare disc left and were already late. Their choice was between a slow (4×) or a fast burning speed option (48×). By choosing the slower burning speed, they took the risk of arriving embarrassingly late for the birthday diner. By choosing the higher speed, they ran the risk of a disc damage, that is, they will be on time but without birthday present. Upon their choice, they were shown a simulated progress bar and were then presented with particular outcomes depending on their experimental condition and their actual choice (4×, 48×). Participants in the *prevention* group were either told that the burning process failed and their last disc was lost (48×) or that the process took too long and that they will be embarrassingly late (4×). In both cases, the negative outcome was presented in a way, which emphasized social duties and responsibilities (i.e., bringing a present, being in time). Both will activate the concept of seeking safety and, thus, a prevention focus. Participants in the *promotion* group received the message that the burning process was successful (48×) or that they made it to the party on time (4×). The positive outcome was presented in a way, which emphasized individual performance, personal growth and approval by others (i.e., having the best present of all, being just in time). This will activate the concept of striving for nurturance and, thus, a promotion focus.

2.4. Dependent variables

2.4.1. A primarily hedonic and a primarily pragmatic product

In the present study, we let participants evaluate and choose between a primarily pragmatic and a primarily hedonic product. We used mp3-player software (Sonique 1.63, see http://en.wikipedia.org/wiki/Sonique_(media_player)) with different "skins" as products. A "skin" is a graphic file used to change the appearance of an application's user interface. Sonique skins vary substantially in presentational style and usability (due to, for example, differences in layout, legibility, positioning of controls), while purpose and functionality remain constant. Overall, we pre-tested 12 different skins according to their pragmatic and hedonic quality. Thirty-one participants rated all skins on four seven-point semantic differential items with the verbal anchors *boring–interesting*, *ordinary–original* (i.e., hedonic quality) and *uncontrollable–controllable*, *complex–simple* (i.e., pragmatic quality) (see Section 2.4.4).

Each pair of items showed high internal consistency (hedonic: Cronbach's $\alpha = .81$; pragmatic: Cronbach's $\alpha = .81$). Based on this, we computed a mean hedonic and a mean pragmatic value for each skin. For our study we selected two skins (see Fig. 1), which differed maximally and significantly on their hedonic (skin A: Mean = 4.82, skin B: Mean = 2.83, $p < .001$) and pragmatic value (skin A: Mean = 3.23, skin B: Mean = 4.79, $p < .001$). In the remainder of the paper we refer to skin A as the (predominantly) hedonic player and B as the (predominantly) pragmatic player.

2.4.2. Affective state before and after focus induction

To verify the successful induction of the regulatory focus, the current *affective state* was measured before and after the actual focus induction. Affective state can be defined "as a neurophysiological state that is consciously accessible as a simple non-reflective feeling. [...This feeling] is an integral blend of [valence] (pleasure–displeasure) and arousal (sleepy–activated) values" (Russell, 2003, p. 147). To measure affective state we used the nine-point, non-verbal *valence* and *arousal* items from the Self-Assessment-Manikin instrument (SAM, Bradley and Lang, 1994).

2.4.3. Affective quality

Affective quality (Russell, 2003) differs conceptually from current affective state (i.e., core affect). In contrast to affective state, affective quality is closely tied to an object and conceptualized as an object's perceived ability to impact and change affective states. Although both constructs differ in concept, Russell (2003) claimed that both can be assessed via the same two underlying dimensions – valence and arousal. Therefore, we used the SAM (Bradley and Lang, 1994) again to measure affective quality of the hedonic and pragmatic player after choice.

2.4.4. Measurement of the hedonic quality, pragmatic quality and appeal

Table 1 shows the items used to measure pragmatic quality, hedonic quality and appeal (i.e., general evaluation). Items are taken from Hassenzahl (2001).

A requirement for the valid and reliable assessment of pragmatic and hedonic quality is a high internal consistency of each

Table 1
Semantic differential items used to capture pragmatic quality (PQ), hedonic quality(HQ), and general evaluation (i.e., appeal) taken from Hassenzahl (2001)

Scale item	Anchors	
PQ 1	Comprehensible	Incomprehensible
PQ 2	Supporting	Obstructing
PQ 3	Simple	Complex
PQ 4	Predictable	Unpredictable
PQ 5	Clear	Confusing
PQ 6	Trustworthy	Shady
PQ 7	Controllable	Uncontrollable
PQ 8	Familiar	Strange
HQ 1	Interesting	Boring
HQ 2	Costly	Cheap
HQ 3	Exciting	Dull
HQ 4	Exclusive	Standard
HQ 5	Impressive	Nondescript
HQ 6	Original	Ordinary
HQ 7	Innovative	Conservative
APPEAL 1	Pleasant	Unpleasant
APPEAL 2	Good	Bad
APPEAL 3	Aesthetic	Unaesthetic
APPEAL 4	Inviting	Rejecting
APPEAL 5	Attractive	Unattractive
APPEAL 6	Sympathetic	Unsympathetic
APPEAL 7	Motivating	Discouraging
APPEAL 8	Desirable	Undesirable

Note: Order of items was randomized, some items were reversed, verbal anchors were in German.

scale combined with low scale intercorrelation. The latter is important to ensure that indeed different concepts were measured (i.e., discriminant validity). Internal consistency for the seven hedonic items was satisfactory (Pooled: Cronbach's $\alpha = .91$; hedonic player only: .78; pragmatic player only: .83). The same was apparent for the seven pragmatic items (Pooled: Cronbach's $\alpha = .95$; hedonic player only: .88; pragmatic player only: .82). Based on this, we calculated a hedonic and pragmatic scale value by averaging the hedonic and pragmatic items, respectively. As required, pragmatic and hedonic quality were not correlated for the pragmatic player ($r = .00$, n.s., $N = 133$) or for the hedonic player ($r = .09$, n.s., $N = 133$). In sum, the measurement of both qualities complies with requirements for reliable and factorial valid measurement.

General evaluation was measured with seven appeal items. Internal consistency of the scale was satisfactory (Pooled: Cronbach's $\alpha = .92$; hedonic player only: .94; pragmatic player only: .89). A mean appeal score was calculated as the average of the seven appeal items.

2.5. Predictions

With respect to product perception (i.e., hedonic, pragmatic) and evaluation (i.e., appeal), we first of all expect the hedonic player to be perceived as primarily hedonic and the pragmatic player to be perceived as primarily pragmatic by our participants. This is a necessary precondition for all remaining analyses.

We further assume that the perception of the products as either primarily hedonic or pragmatic is not affected by the induced regulatory foci (promotion, prevention). General evaluation (i.e., appeal), however, should be affected by foci, with higher appeal ratings given a fit between the product's attributes and the activated regulatory focus (i.e., promotion – primarily hedonic, prevention – primarily pragmatic).

The same holds true for affective quality–valence, which should as well be moderated by regulatory focus: a fit between focus and product attributes (e.g., promotion – primarily hedonic) will lead to more positive affective perceptions compared to a lack of fit (e.g., promotion – primarily pragmatic). This prediction parallels the prediction for the general evaluation, which is due to the obvious overlap of affective quality and appeal.

In contrast, we assume affective quality–arousal not to be moderated by the activated regulatory focus. However, arousal and hedonic quality should be linked, because pleasurable stimulation is conceptualized as an important component of hedonic quality, captured by product attributes, such as *exciting*, *original* or *innovative* (Hassenzahl, 2003). This is supported by Desmet et al. (2001), who elicited the preferred affective quality of mobile phones. One group of participants preferred low arousal another group high arousal. A further interview (i.e., laddering) to explore the underlying reasons showed hedonic motives (freedom, high self-esteem) for the high arousal group and pragmatic motives (comfortable life, security) for the low arousal group. In sum, hedonic quality should be linked to psychological arousal.

As long as choice will depend on the perceived value of a product, we predict that changes in the valence of affective quality towards a product and its general appeal should also lead to changes in choice behavior. Specifically, we assume that the hedonic player should be more likely to be chosen by participants in a promotion focus compared to participants in a prevention focus.

3. Results and discussion

3.1. Manipulation check: focus induction

The induction of the prevention focus (by the "priming task") was accompanied by a significant change in the valence of the affective state, $t(66) = 9.29$, $p < .001$. It dropped from the positive (Mean = 6.05, SE = 0.19) to a negative assessment of momentary affect (Mean = 3.64, SE = 0.17). In the promotion focus condition, momentary affect remained positive, $t(65) = 0.09$, n.s. (before: Mean = 5.94, SE = 0.20; after: Mean = 5.91, SE = 0.28). Both led to a significant difference in affect after the focus induction procedure, $t(131) = 7.00$, $p < .001$. One may argue that the induction procedure rather manipulated affective state (i.e., mood) than regulatory focus. However, none of the important dependent variables (affective quality–valence, appeal, and choice) were correlated with the valence of the affective state after the induction (correlations were in the range from .08 to −.01.), which makes this alternative explanation very unlikely.

As expected, arousal was not impacted significantly by the focus induction and no post-induction differences existed (after prevention: Mean = 5.78, SE = 0.24; after promotion: Mean = 5.68, SE = 0.25; $t(131) = -0.27$, n.s.). As above, neither affective quality–valence, appeal, nor choice were correlated with arousal (−.06 to .03). In sum, the manipulation was successful.

3.2. Manipulation check: products

A necessary precondition for further analyses is to make sure that both players were perceived as pre-tested, that is the hedonic player should be perceived as primarily hedonic and the pragmatic player as primarily pragmatic. To test this, we performed a $2 \times 2 \times 2$ analysis of variance with *player* (pragmatic, hedonic) and *quality aspect* (pragmatic, hedonic) as within-subject factors, *focus* (prevention, promotion) as a between-subject factor and the actual *value* of the hedonic and pragmatic scale as the dependent variable. We expected a disordinal interaction of *player* and *quality aspect*, without further interactions with regulatory focus. (Recall that quality perceptions should be independent from focus.)

Our analysis revealed a significant main effect of *quality aspect*, $F(1,131) = 6.83$, $p < .01$, $\eta^2 = .05$., which was further qualified by a highly significant interaction of *quality aspect* with *player*,

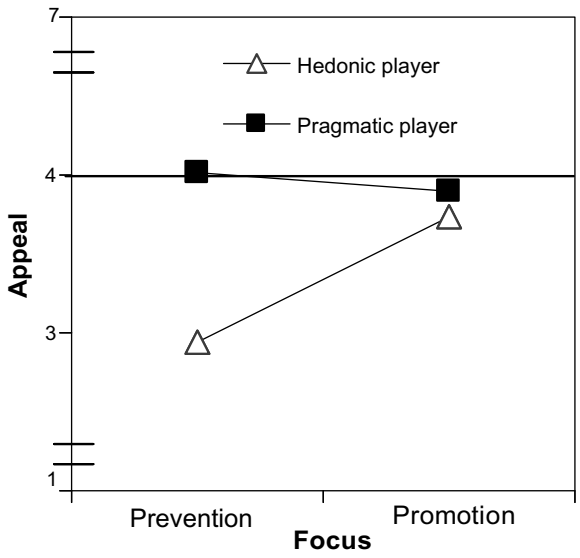

Fig. 2. Appeal (i.e., general evaluation) of the primarily hedonic and pragmatic player separately for the prevention and promotion focus.

$F(1,131) = 826.22$, $p < .001$, $\eta^2 = .86$. This interaction was disordinal with the hedonic player being perceived as primarily hedonic (hedonic: Mean = 5.15, SE = 0.07; pragmatic: Mean = 2.61, SE = 0.09) and the pragmatic player being perceived as primarily pragmatic (hedonic: Mean = 2.79, SE = 0.09; pragmatic: Mean = 5.49, SE = 0.08). None of the remaining main effects and interactions was significant. This shows that the players intended to be perceived as primarily hedonic or pragmatic are in line with the ratings of the participants.

3.3. Product evaluation

Fig. 2 shows the mean appeal ratings for the hedonic and pragmatic player for individuals in a prevention or promotion focus.

A 2 × 2 analysis of variance with *player* (pragmatic, hedonic) as a within-subject factor, *focus* (prevention, promotion) as a between-subject factor and *appeal* as the dependent variable revealed significant main effects for *player*, $F(1,131) = 11.67$, $p < .001$, $\eta^2 = .08$, and *focus*, $F(1,131) = 9.27$, $p < .01$, $\eta^2 = .07$, which were further qualified by a highly significant *player* × *focus* interaction, $F(1,131) = 6.74$, $p < .01$, $\eta^2 = .05$. As expected, promotion-focused participants rated the hedonic player as significantly more appealing compared to prevention-focused participants, diff = .81, $t(131) = 3.47$, $p < .01$. The reverse effect was apparent, but not significant for the pragmatic player, diff = −.13, $t(131) = -0.68$, n.s..

3.4. Affective quality

In general, arousal and valence ratings were neither correlated for the pragmatic nor for the hedonic player (pragmatic: $r = .12$, n.s., $N = 133$; hedonic: $r = -.14$, n.s., $N = 133$). Fig. 3 shows the mean ratings for arousal and valence for each player (pragmatic, hedonic) and each focus.

As expected, a 2 × 2 analysis of variance with *focus* (promotion, prevention) as a between-subject factor, *player* (pragmatic, hedonic) as a within-subject factor and *arousal* as the dependent variable revealed a highly significant main effect for *player* only, $F(1,131) = 161.71$ $p < .001$, $\eta^2 = 0.55$, with more arousal for the hedonic (Mean = 5.66, SE = 0.19) compared to the pragmatic player (Mean = 2.77, SE = 0.14). Confidence intervals (95%) showed arousal to be significantly above the center of the scale (5) for the hedonic (lower bound: 5.28) and below for the pragmatic player (upper bound: 3.06).

A further 2 × 2 analysis of variance with *focus* (promotion, prevention) as a between-subject factor, *player* (pragmatic, hedonic) as a within-subject factor and *valence* as the dependent variable revealed a highly significant main effect for *player*, $F(1,131) = 11.31$, $p < .001$, $\eta^2 = .08$, with a more positive reaction to the pragmatic (Mean = 5.45, SE = 0.13) compared to the hedonic player (Mean = 4.58, SE = .20). The main effect was further qualified by a highly significant *focus* × *player* interaction, $F(1,131) = 7.38$, $p < .001$, $\eta^2 = .05$. The hedonic player was perceived as more positive by promotion-focused (Mean = 5.12, SE = 0.28) compared to prevention-focused participants (Mean = 4.05, SE = .28, $t(131) = 2.72$, $p < .01$), whereas the pragmatic player was perceived as – albeit not significantly – more positive by promotion-focused (Mean = 5.61, SE = 0.19) compared to prevention-focused participants (Mean = 5.29, SE = 0.19, $t(131) = -1.23$, n.s.).

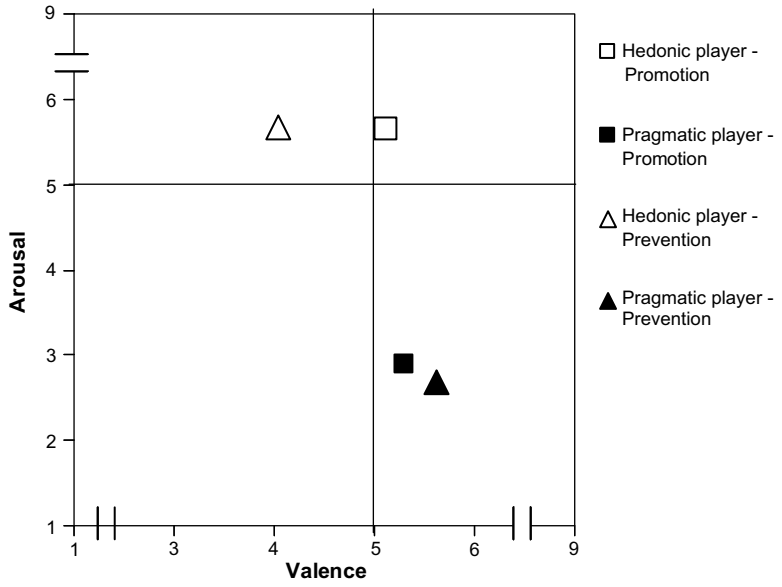

Fig. 3. Affective quality (valence, arousal) of the primarily hedonic and pragmatic player separately for the prevention and promotion focus.

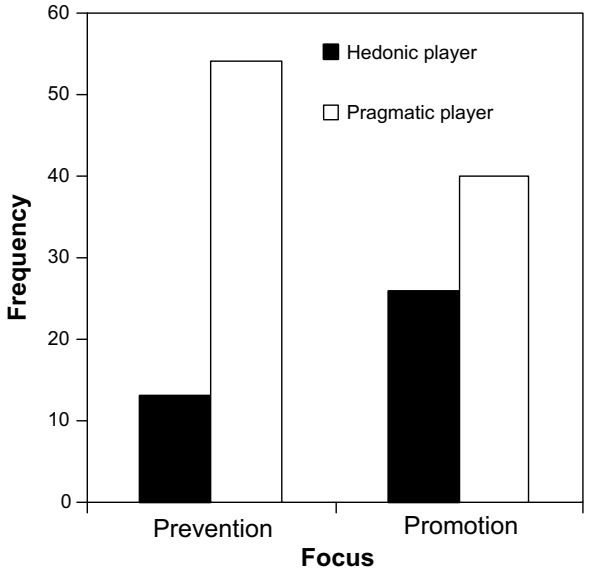

Fig. 4. Absolute frequency of choosing the primarily hedonic or pragmatic player in the prevention and promotion focus.

According to Russel's (2003) description of the interplay of valence and arousal, the induced focus changed the perceived affective quality of the hedonic player from 'exciting' to 'upsetting', whereas the pragmatic player remained 'calm'.

3.5. Choice

Fig. 4 shows the absolute frequency of choices of the pragmatic or hedonic player in either prevention or promotion focus.

In general, the pragmatic player was preferred over the hedonic (94 of 133, 71%, $\chi^2(1) = 22.74$, $p < .001$). In addition, there was the expected effect of focus on choice, with more hedonic (and less pragmatic) choices in the promotion compared to the prevention focus, $\chi^2(1) = 6.41$; $p = 0.01$. Promotion-focused participants chose the hedonic player twice as often as prevention-focused participants.

4. Summary and conclusion

The present study demonstrates how different motivational orientations, namely different *regulatory foci*, impact choice, evaluation and perceived affective quality. A closer look at the findings, however, reveals a certain asymmetry: Whereas the effect of regulatory focus on the perceived appeal and affective quality of the primarily hedonic player was significant, all observed differences of the evaluation of the primarily pragmatic player were in the predicted direction, but not as strong. Strictly speaking, the hedonic player was more prone to be devalued if participants were in an incompatible mode (i.e., prevention mode) compared to the pragmatic player. Whether this is a generalizable outcome stemming from inherent differences in the way hedonic or pragmatic products are perceived or whether it is just a matter of differences in the strength of the effect stemming from the products (e.g., mp3-players mainly fulfill pragmatic functions) must remain open. However, despite this slight limitation the present findings are nevertheless able to make a crucial point – to demonstrate that motivational orientations impact product evaluation and choice. This suggests that perceived value depends on the fit between product character (primarily hedonic, primarily pragmatic) and regulatory focus (promotion, prevention).

Generally, the pragmatic player was preferred over the hedonic player (e.g., main effect on appeal, main effect on choice). This may be due to a priori differences in the appeal of both players. An alternative explanation, however, refers to the particular judgmental situation in the present study. Hsee (1996) argued for a fundamental difference between situations in which two options are evaluated either separately or jointly. Okada (2005) applied this argument to the choice between hedonic and utilitarian consumer goods. Specifically, she showed that in case of a separate evaluation a hedonic product will be rated as more appealing than an utilitarian product of the same monetary value. However, in a joint evaluation situation the utilitarian product is preferred. In the present study, the same effect may have led to a better evaluation and more frequent choice of the pragmatic player. In other words, the observed general differences in the evaluation and choice of the players may be rather due to the particular situation (i.e., joint evaluation in a choice situation) than to a true, a priori difference of the appeal of both players.

Another interesting finding is the difference in affective quality–arousal between the hedonic and pragmatic player. It was argued that experiencing pleasurable stimulation is an important be-goal and that product attributes such as novelty or originality (i.e., hedonic quality) signal potential fulfillment of this goal. The present study establishes the link between specific product attributes (e.g., novelty) and expected psychological outcomes (i.e., arousal) as predicted by the notion of hedonic quality, and, thus lends credit to the underlying model.

In sum, the present results consistently support the idea that product appeal and choice is strongly context-dependent. In our study, the regulatory foci were situationally induced by a priming task, and it was shown that these foci impact a subsequent, seemingly unrelated evaluation and choice task. In real situations, the existence and impact of regulatory foci might be rather thought of as a natural response to particular situational cues. The motivational orientation adapts goal attainment and related behavior to the situation at hand. Therefore, motivational orientations may then be thought of as "shortcuts", which free us from the burden of considering a large variety of diverse, potentially occurring situations. If we better understand, how different motivational orientations color product evaluation, choice and use, we may be able to make some fundamental design decisions holding for a wide variety of situations, without actually having to know and to describe these situations in detail.

The most important message of the present paper for practitioners and researchers in the field of HCI and user-centered design is to abandon the still widespread idea that the perceived value of an interactive product is stable, given its fit into a particular context of use. We must embrace the idea that value is generated in the moment of the human-product interaction, and that different qualities may have changing appeal depending on a person's state or motivational orientation. Design may anticipate that, but more importantly product evaluation has to learn its twofold lesson, namely that (1) general measures of value, appeal, or satisfaction may be fleeting and less reliable than measures of product perception, such as a measure of pragmatic quality, and that (2) particular product attributes are not per se more important than others. Especially, the latter may be hard to accept as long as it implies that a quality such as usability is *not* a necessary precondition for appeal as, for instance, Jordan's (2000) hierarchical concept of utility, usability and pleasure suggests. Usability is important, if people focus on the attainment of do-goals or the presence and absence of negative outcomes. If in a given moment, they rather care about particular psychological needs, such as attaining pleasurable stimulation, other, hedonic qualities will become more important. Focusing on pragmatic qualities alone will inevitable fail to produce appealing interactive products in the same way a focus on he-

donic quality alone will fail. The challenge is to consider both qualities and to find a balance. Understanding the link between particular product attributes and context-dependent prioritizations of individual needs and motives (Hassenzahl, 2006; Sheldon et al., 2001) is an important step towards this goal, taken by the present study. Future studies will dive deeper into the impact of psychological states on product evaluation and choice.

References

Batra, R., Ahtola, O.T., 1990. Measuring the hedonic and utilitarian sources of consumer choice. Marketing Letters 2, 159–170.

Bradley, M.M., Lang, P.J., 1994. Measuring emotion: the self-assessment manikin and the semantic differential. Journal of Behavior Therapy and Experimental Psychiatry 25, 49–59.

Carver, C.S., Scheier, M.F., 1989. On the Self-Regulation of Behavior. Cambridge University Press, New York.

Desmet, P.M.A., Overbeeke, C.J., Tax, S.J.E.T., 2001. Designing products with added emotional value: development and application of an approach for research through design. The Design Journal 4, 32–47.

Florack, A., Scarabis, M., Gosejohann, S., 2005. Regulatory focus and consumer information processing. In: Kardes, F.R., Herr, P.M., Nantel, J. (Eds.), Applying Social Cognition to Consumer-Focused Strategy. Lawrence Erlbaum Associates., Mahwa, NJ, pp. 235–263.

Friedmann, R.S., Förster, J., 2001. The effects of promotion and prevention cues on creativity. Journal of Personality and Social Psychology 81, 1001–1013.

Gaver, W.W., Martin, H., 2000. Alternatives. Exploring information appliances through conceptual design proposals. In: Turner, T., Szwillus, G. (Eds.), Proceedings of the CHI 2000 Conference on Human Factors in Computing. ACM, Addison-Wesley, New York, pp. 209–216.

Hartmann, J., Sutcliffe, A., De Angeli, A., 2007. Investigating attractiveness in web user interfaces. In: Proceedings of the CHI 2007 Conference on Human Factors in Computing. ACM, Addison-Wesley, New York, pp. 387–396.

Hassenzahl, M., 2001. The effect of perceived hedonic quality on product appealingness. International Journal of Human–Computer Interaction 13, 479–497.

Hassenzahl, M., 2003. The thing and I: understanding the relationship between user and product. In: Blythe, M., Overbeeke, C., Monk, A.F., Wright, P.C. (Eds.), Funology: From Usability to Enjoyment. Kluwer, Dordrecht, pp. 31–42.

Hassenzahl, M., 2006. Hedonic, emotional, and experiential perspectives on product quality. In: Ghaoui, C. (Ed.), Encyclopedia of Human–Computer Interaction. Idea Group, pp. 266–272.

Hassenzahl, M., Kekez, R., Burmester, M., 2002. The importance of a software's pragmatic quality depends on usage modes. In: Luczak, H., Cakir, A.E., Cakir, G. (Eds.), Proceedings of the 6th international conference on Work With Display Units (WWDU 2002). ERGONOMIC Institut für Arbeits- und Sozialforschung, Berlin, pp. 275–276.

Hassenzahl, M., Platz, A., Burmester, M., Lehner, K., 2000. Hedonic and ergonomic quality aspects determine a software's appeal. In: Turner, T., Szwillus, G. (Eds.), Proceedings of the CHI 2000 Conference on Human Factors in Computing. ACM, Addison-Wesley, New York, pp. 201–208.

Hassenzahl, M., Ullrich, D., 2007. To do or not to do: differences in user experience and retrospective judgments depending on the presence or absence of instrumental goals. Interacting with Computers 19, 429–437.

Higgins, E.T., 1998. Promotion and prevention: regulatory focus as a motivational principle. In: Zanna, M.P. (Ed.), Advances in Experimental Social Psychology. Academic Press, San Diego, pp. 1–46.

Higgins, E.T., 2002. How self-regulation creates different values: the case of promotion and prevention decision making. Journal of Consumer Psychology 12, 177–191.

Hsee, C.K., 1996. The evaluability hypothesis: an explanation for preference reversals between joint and separate evaluations of alternatives. Organizational Behavior and Human Decision Processes 67, 247–257.

Huffman, C., Houston, M.J., 1993. Goal-oriented experiences and the development of knowledge. Journal of Consumer Research 20, 190–207.

Jordan, P., 2000. Designing Pleasurable Products. An Introduction to the New Human Factors. Taylor & Francis, London, New York.

Logan, R.J., Augaitis, S., Renk, T., 1994. Design of simplified television remote controls: a case for behavioral and emotional usability. In: Proceedings of the 38th Human Factors and Ergonomics Society Annual Meeting. HFES, Santa Monica, pp. 365–369.

Malone, T.W., 1984. Heuristics for designing enjoyable user interfaces: lessons from computer games. In: Thomas, J.C., Schneider, M.L. (Eds.), Human Factors in Computer Systems. Ablex, Norwood, NJ, pp. 1–12.

Okada, E.M., 2005. Justification effects on consumer choice of hedonic and utilitarian goods. Journal of Marketing Research 42, 43–53.

Reynolds, T.J., Olson, J.C., 2001. Understanding Consumer Decision Making: A Means End Approach to Marketing and Advertising Strategy. Lawrence Erlbaum, Mahwah, NJ.

Rokeach, M., 1973. The Nature of Human Values. Free Press, New York.

Rozendaal, M.C., Keyson, D.V., Ridder, H.D., 2007. Product behavior and appearance effects on experienced engagement during experiential and goal-directed tasks. In: Proceedings of the International Conference on Designing Pleasurable Products and Interfaces (DPPI2007), pp. 181–194.

Russell, J.A., 2003. Core affect and the psychological construction of emotion. Psychological Review 110, 145–172.

Ryan, R.M., Deci, E.L., 2000. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist 55, 68–78.

Safer, D.A., 1998. Preferences for luxurious or reliable products: promotion and prevention focus as moderators. Columbia University, Department of Psychology.

Schwartz, S.H., Bilsky, W., 1987. Toward a universal psychological structure of human values. Journal of Personality and Social Psychology 3, 550–562.

Sheldon, K.M., Elliot, A.J., Kim, Y., Kasser, T., 2001. What is satisfying about satisfying events? Testing 10 candidate psychological needs. Journal of Personality and Social Psychology 80, 325–339.