1. INTRODUCTION

Recently, a significant volume of research has focused on the experiential aspects of product use, such as affective or pleasurable qualities [1-5]. How a user interacts with a product creates a specific product experience. In this process, a user operates a product step-by-step to achieve a specific goal; thus, understanding their thoughts and interactions at each step is a key objective when assessing user experience. Kahneman [6] argues that a user's experience can be evaluated based on an objective assessment over a period of time. However, there is a difference between the user’s immediate experience (i.e., during the user–product interaction) and their retrospective experience (i.e., the recalled experience after the interaction is complete) [7]. Although both of these types of experience are important, retrospective experience is more of a concern for designers because the user’s memory will influence their willingness to purchase a product and repeat the interactions in the future.

The peak-end rule, which was first proposed in 2002, states that retrospective experience is affected by the peak and end valences of the emotions generated during an experience. According to the peak-end rule, the higher the peak-end valence, the better the memory, and vice versa [8]. The peak-end rule has been adopted by many successful companies, including IKEA, which arranges its store traffic flow in a way that leads consumers to buy ice cream after their long shopping journey. This not only relieves their customers of anxiety when paying for their goods but also offers them a positive ending and an excellent memory [9].

Another approach we used to assess the product-use process is the Kano Model, commonly used in Kansei engineering, which was developed to identify relationships between user experience and product characteristics, thus enabling the users’ feelings to be translated into product parameters in order to elicit the desired experience [10-12]. However, prior research has shown that the relationship between user experience and those product characteristics that influence product satisfaction is asymmetrical and nonlinear [13, 14]. The Kano model is a two-dimensional quality model that divides product characteristics into, among others, attractive, one-dimensional, and must-be qualities. This model provides guidance for design teams in handling trade-offs between characteristics during the product development stage [14-19].

In order to clearly understand how a user interacts with a product and their satisfaction based on user experience, the present study applies the peak-end rule and the Kano model in the assessment of user experience. Because these two methods differ in how they analyze users’ emotions, we aim to find similarities and differences between these two methods and integrate them in the evaluation of user experience. Based on a sequence of steps in the product-use process, the peak-end rule focuses on the sequence of time and extreme affective events, especially the peak and final affective moments, in a user–product interaction. On the other hand, the Kano model emphasizes the relationship between product characteristics and user satisfaction to categorize these characteristics into qualities.

Thus, the research objectives of this study were to explore the applicability of the peak-end rule and the Kano model in evaluating the user experience and clarifying the
similarities and differences between the two approaches in order to maximize the benefits of integrating them in an evaluation framework.

2. THEORETICAL BACKGROUND

2.1 Peak-end rule

The peak-end rule posits that people’s feelings when recalling an event are affected by the peak and end valences of the experience [8]. Kahneman et al. (1993) conducted colonoscopy experiments dividing participants into two groups. Group A suffered extreme pain during the colonoscopy, which abruptly ended while they were still in extreme pain. Group B also suffered the same pain levels, but they lasted longer before easing until they suffered less pain by the end of the colonoscopy. Their research found that the participants in Group A had a more negative recall of the colonoscopy. Thus, it was concluded that people would report a more negative experience of an event if they had a worse experience at the end of the event, while the length of the experience has no significant effect [8, 20].

Based on the peak-end rule, the present study focused on seven evaluation measures for the emotional valence of a participant during an experience. These measures were scored from –5 to +5, where –5 is the least satisfied and +5 is the most satisfied.

- Positive peak valence: the highest value for the emotional valence during the experience, which can happen at one or several steps during the experience [21, 22].
- Negative peak valence: the lowest value for the emotional valence during the experience, which can happen at one or several steps during the experience [21, 22].
- End valence: the final value for the emotional valence at the end of the experience.
- Peak-end valence: the average of the peak valence (the positive or negative peak) and the end valence (Fig. 1). The peak valence with the larger absolute value is used for the calculation. If the absolute values are equal, we select the one that is closer to the average valence for the calculation.
- Average valence: the average of the emotional valence for every step during the experience. Some studies have reported that the average valence is a better predictor than the peak-end valence for the recall of an experience [22-25].
- Immediate satisfaction: the overall evaluation of an experience assessed immediately after completing all steps in the product-use process. Immediate satisfaction is used as a comparison for retrospective satisfaction.
- Retrospective satisfaction: the overall evaluation of an experience assessed one month after using the product.

After monitoring the emotional valence of the user for all steps in the experiment, we used correlation and regression to analyze the emotional valence measures in relation to immediate and retrospective satisfaction to verify the peak-end effect on user experience and to determine which steps in the product-use process were most important.

2.2 Kano model

Kano [13] developed a two-dimensional model to explain the relationship between product attributes and customer satisfaction. It classifies product attributes into six individual qualities. Each category reflects specific characteristics and affects customers in different ways.

- Attractive quality: customer satisfaction increases sharply with greater attribute performance. However, customer satisfaction does not decrease if the performance of this attribute is insufficient.
- One-dimensional quality: customer satisfaction is a linear function of the performance of this product attribute. High performance of a product attribute leads to high satisfaction and vice versa.
- Must-be quality: the customer will be extremely dissatisfied if the performance of this product attribute is insufficient or absent. On the other hand, user satisfaction does not increase when the performance expectations are met.
- Indifferent quality: the customer is indifferent to this product attribute.
- Reverse quality: the customer is more dissatisfied with an increase in the performance of this attribute.
- Questionable quality: the results for customer satisfaction and dissatisfaction are contradictory. Typically, answers are not allocated to this category.

To assign specific product attributes to their respective Kano categories, a Kano questionnaire is typically employed [13]. Each attribute is measured based on two opposite situations: when it is sufficient or functional, and
Integrating the Peak-end Rule and the Kano Model in Assessing the Product-use Process

when it is insufficient or dysfunctional. The customers respond to these situations by scoring how satisfied or dissatisfied they would be in that situation.

By combining responses for the two opposing situations in a Kano evaluation table (Table 1), each product attribute can be classified into one of the six quality categories.

The customer satisfaction (CS) coefficient is an alternate method to categorize product attributes that can demonstrate the quantitative level of satisfaction and dissatisfaction that is influenced by fulfilling or not fulfilling a product requirement [14]. The CS coefficient can be divided into the satisfaction index (SI) and the dissatisfaction index (DI) [26, 27]. The SI indicates how strongly a product attribute may increase customer satisfaction, while the DI indicates how strongly a product attribute may increase customer dissatisfaction when it does not fulfill the user’s needs. The DI is negative to emphasize its negative influence on customer satisfaction if this product quality is insufficient.

Satisfaction index (SI):

\[
SI = \frac{A + O}{A + O + M + I}
\]  

Dissatisfaction index (DI):

\[
DI = \frac{- (O + M)}{A + O + M + I}
\]

The SI ranges from 0 to 1, with values closer to 1 representing a larger influence on customer satisfaction. The DI ranges from –1 to 0, with values closer to –1 having a stronger influence on dissatisfaction. The absolute values of the DI and SI can be translated to co-ordinates in a DI–SI plot, which can then be used to classify product attributes into four categories: must-be, one-dimensional, attractive, and indifferent (Fig. 2).

### 2.3 Research questions

The primary research objective of the present study was to explore the suitability of the peak-end rule and the Kano model in assessing user experience. To analyze the peak-end rule, we classified the product-use steps as emotional episodes, while we defined product-use steps as product attributes for the Kano model and classified them into quality categories. Based on the characteristics of these two approaches, we proposed three specific research questions:

Q1. Are the peak and end steps in the product-use experience significant in regression analysis for retrospective satisfaction or immediate satisfaction?

Q2. Can the significant steps identified in the peak-end rule experiment be categorized into the main Kano categories (attractive, one-dimensional, and must-be)?

Q3. What are the similarities and differences between the Kano model and the peak-end rule in terms of assessing the product-use process?

### 3. EXPERIMENTAL DESIGN

To verify our proposed structure based on the peak-end rule and the Kano model in a real product-use process, we conducted two experiments with a common product. Based on the affect circumplex [28], we used an expert group to classify products and chose a juice blender as the research product because it was characterized by high arousal and a pleasant value in the affect circumplex, making it suitable for an emotional evaluation experiment [29].

#### 3.1 Establishing product-use steps for the juice blender

In a pre-test, six participants were recruited to use the blender to make a glass of watermelon juice. During operation, the participants differentiated the steps that they were using. Based on this, we established 15 steps: Plug in the blender → Put in fruit → Position the container → Position the upper cover → Low speed → Turn on → Stop →

### Table 1: Kano evaluation table [15]

| Product Criteria/Attributes | Insufficient | Satisfied | Should be | Indifferent | Live with | Dissatisfied |
|-----------------------------|--------------|-----------|-----------|-------------|-----------|--------------|
| Satisfied                   | Q            | A         | A         | A           | Q         |              |
| Should be                   | R            | I         | I         | I           | M         |              |
| Indifferent                 | R            | I         | I         | I           | M         |              |
| Live with                   | R            | I         | I         | I           | M         |              |
| Dissatisfied                | R            | R         | R         | R           | Q         |              |

A = attractive, O = one-dimensional, M = must-be, I = indifferent, R = reverse, Q = questionable.
Advance Publication

High speed → Turn on → Stop → Remove the upper cover → Pour the juice into the glass → Clean the container → Unplug the blender → Return to the original position.

The steps, “low speed”, “turn on”, “stop”, “high speed”, “turn on” and “stop”, all required a press of a button. “Turn on” and “turn on” and “stop” and “stop” used the same buttons, but we differentiated them by time.

3.2 First experiment: Peak-end rule

The first experiment was based on the peak-end rule. We recorded the users’ emotions at each step in the process of using the product and their immediate satisfaction after all of the steps had been completed (the recording chart is presented in Appendix 1) and conducted short interviews with the participants. After one month, we asked the participants for their retrospective satisfaction with the experience using an online questionnaire.

A total of 31 participants (10 males and 21 females) took part in the first experiment. They ranged from 18 to 32 years old and were all students at National Cheng Kung University. Before the experiment, the participants were taught the process of using the juice blender following the researcher’s instructions. During the experiment, they used the juice blender and evaluated their emotions at each step in the process using the speaking-aloud method. At the same time, the researcher recorded the participants’ emotions after 1–3 steps on the whiteboard to minimize interruptions to the product-use process and avoid any influence on the peak-end effect.

3.3 Second experiment: Kano model

The second experiment was based on the Kano model, with each step classified as a product attribute in the Kano questionnaire. During a real product-use process, two factors are particularly important in usability testing: aesthetic appeal and the inherent usability of a product [30]. Thus, in this study, aesthetics and usability were included in the Kano questionnaire. They were tested for each step in the product-use process using two questions each that were related to sufficient and insufficient scenarios (Table 2).

The second experiment recruited 33 participants (12 males and 21 females) aged 18–24 years old from National Cheng Kung University. During this experiment, the participants used the juice blender directly because the questions regarding the situations were hypothetical, so the product-use experience only supported their imagination regarding the four situations. After using the blender, the participants filled out the Kano questionnaire and chose the steps that were important to them for assessing satisfaction. This process can help to establish priorities for product development and identify potential improvements [15].

Table 2: Structure of the Kano questionnaire [17]

| Sample Questions | Dissatisfied | I can live with it | I am indifferent | It should be that way | Satisfied |
|------------------|--------------|-------------------|-----------------|----------------------|----------|
| In step X, if it was **much more beautiful** in appearance, how would you feel? | | | | | |
| In step X, if it was **much less beautiful** in appearance, how would you feel? | | | | | |
| In step X, if it was **much easier to use**, how would you feel? | | | | | |
| In step X, if it was **much harder to use**, how would you feel? | | | | | |

Table 3: Correlation of the evaluation valences (N=31)

|                | 1     | 2     | 3     | 4     | 5     | 6     | 7     |
|----------------|-------|-------|-------|-------|-------|-------|-------|
| Positive peak  |       | .925* |       |       |       |       |       |
| Negative peak  | .295* |       |       |       |       |       |       |
| Average        | .221  | .704**|       |       |       |       |       |
| Peak-end       | .571**| .855**| .780**|       |       |       |       |
| Immediate      | .491**| .882**| .916**|       |       |       |       |
| Retropective   | .394**| .763**| .707**| .876**| .907**|       |       |
| Positive peak  |       |       |       |       |       |       |       |
| Negative peak  |       |       |       |       |       |       |       |
| Average        |       |       |       |       |       |       |       |
| Peak-end       |       |       |       |       |       |       |       |
| Immediate      |       |       |       |       |       |       |       |
| Retropective   |       |       |       |       |       |       |       |

Positive peak=positive peak valence, Negative peak=negative peak valence, End=end valence, Average=average valence, Peak-end=peak-end valence, Immediate=immediate satisfaction. * p<.05, ** p<.01

4. RESULTS

4.1 Peak-end rule experiment

The mean for each step across the participants is presented in Figure 3. The step “pour the juice into the glass” was the highest-rated and the step “clean the container” was the lowest-rated. There were 14 participants (45% of the subjects) whose positive peak valence occurred at the “turn on” step and 12 (39% of the subjects) whose positive peak valence occurred at the “turn on” step. In contrast, 25 participants (81% of subjects) reported a negative peak for the “clean the container” step.

In the correlation analysis, three valences were highly correlated with retrospective satisfaction (Table 3). The high correlation between peak-end valence and retrospective satisfaction exhibited a significant peak-end effect. However,
the average valence and immediate satisfaction were highly correlated with retrospective satisfaction, suggesting that there may be a mediation effect. Thus, we conducted two mediation analyses to confirm this assumption. The results showed that the immediate satisfaction is full mediation, but the average valence does not have mediation (Tables 4 and 5).

Finally, we conducted two regression analyses to determine which steps were significant in the product-use process. We set immediate satisfaction and retrospective satisfaction separately as the dependent variable (Y), with each step as the independent variable (X). Table 6 presents the results of backward elimination.

### 4.2 Kano model experiment

In Table 7, the quality category for each product attribute was determined based on the percentage of answers in the Kano evaluation table and the CS coefficients, based on the SI and DI. Because of the different results arising from the two methods, we classified the step “Position the container” as both an indifferent quality and an attractive quality.

### 5. DISCUSSION

This study conducted two experiments using a juice blender as a case study to explore the applicability of the peak-end rule and the Kano model for assessing user experience. In the peak-end rule experiment, participants focused on user–product interactions and their emotions at every step. We extracted their emotional valences to conduct correlations and regressions to verify the peak-end effect for their retrospective satisfaction. In the Kano model experiment, the participants imagined four hypothetical situations for each step after using the product. After the steps had been classified into different quality categories, we compared the results of the two experiments. The insights gained from these experiments based on our research questions are presented in the following sub-sections.
5.1 Negative peak valence stands out in retrospective regression

We expected the peak and end steps to be extracted in the regression. However, in our results, only the negative peak stood out in the retrospective regression.

Neither step “pour the juice into the glass”, which had the highest mean score, nor “turn on”, which had the highest number of participants report their positive emotional peak, were significant in the regression analysis for retrospective satisfaction. The step “turn on” was only significant for immediate satisfaction. On the other hand, the step “clean the container”, which had the highest number of participants report their negative peak valence and had the lowest mean score, was significant in the retrospective regression. This finding is in accordance with previous studies that have found negative emotions can more strongly influence memory and be remembered more clearly than positive emotions [31, 32]. However, the end step was not found to be significant for either immediate or retrospective satisfaction. Some previous studies have reported that the end effect weakens after an experience [33].

5.2 Immediate satisfaction mediates the effect of peak-end valence on retrospective satisfaction

Although peak-end valence was highly correlated with retrospective satisfaction as expected, average valence and immediate satisfaction were both highly correlated as well.

Average valence, which some previous studies have claimed is a better predictor than peak-end valence for retrospective assessment [22, 23], does not be the mediation in our study. However, immediate satisfaction fully mediated the relationship between peak-end valence and retrospective satisfaction, which was unexpected.

5.3 Individual differences is a factor in assessing emotions

In the short interviews with the participants, we found that their personal memories and preference for the product influenced their overall satisfaction. Personal experience can affect subjective emotional assessment and memory construction [15, 34]. In addition, the emotional valence measures were self-reported, meaning they were susceptible to individual differences. The participants who rated their emotions more highly during the experiment also exhibited a higher valence for overall satisfaction. Due to this, it was difficult to verify the relationship between the valence measures. Further research is required to physiologically monitor emotional fluctuations to produce more reliable measurements [35].

5.4 Most steps are classified as an indifferent quality

In the results for the quality categorization, all of the steps were classified as an indifferent quality for aesthetics and more than half of the steps were classified as an indifferent quality for usability. The reason why the indifferent category dominated the observations could be that dividing the interaction with the product into steps led to an incomplete and discontinuous experience, thus the participants could not focus on a specific function or product attribute.

In addition, the participants’ unfamiliarity with the juice blender and their expectations for the aesthetics and usability of the product may have also influenced the results. In the experiment, a few participants asked for the hypothetical situations for aesthetics to be explained.

However, Kano believed that indifferent qualities may become attractive qualities during the product lifecycle so
they should not be neglected. Indifferent qualities may be innovative in nature, meaning customers are indifferent to them when they are introduced for the first time, but they are still worth further exploration [13].

5.5 Subjective importance connects to one-dimension quality

In this study, the participants placed emphasis on the steps where they could easily imagine improvements to the product, so the four steps that the participants regarded to be the most important were one-dimensional qualities, in which customer satisfaction has a linear relationship with the performance of the product attribute. However, this finding differs from an earlier study that found users are more likely to perceive basic functions (i.e., must-be qualities) as being more important [36].

The results for the quality categories for each step can provide a complete design plan for design development. For example, the “plug in the blender” and “position the container” steps are attractive qualities that should exhibit high usability to have a strong effect on customer satisfaction. In addition, the “remove the upper cover”, “pour the juice into the glass” and “clean the container” steps were one-dimensional qualities, thus their usability must maintain a high performance to satisfy customers.

5.6 Benefits to integrating the two approaches in assessing the user experience

Table 8 presents an overview of the results from the peak-end effect and Kano model experiments, with the subjective importance of every step also listed. It can be seen that the characteristics of the two assessment approaches were distinctive, so their respective strengths can be reflected in the assessment of user experience. In particular, in the present study, the peak-end rule highlights the step that generates higher negative emotion, while the Kano model specifies user expectations about the usability of the product-use steps.

It is also worth mentioning that the two assessment approaches produced coinciding results. The “position the upper cover” and “remove the upper cover” steps, which were connected to the same product attribute, stood out in both experiments (Table 8). In addition, the “clean the container” step was also prominent in both two results. The similarity of the results can be used as an indication of their reliability. Thus, the results from the two approaches can be used to confirm the users’ opinions in product-use assessment. Integrating the results can also provide more concrete and specific directions for improving a product.

By contrast, two other noncoinciding findings also illustrated the individual advantages of the two approaches for the assessment of user experience. As the results show, three steps, the “plug in the blender”, “position the container” and pour the juice into the glass” were recognized as important steps in Kano model, but not in the regression of peak-end rule. We observed that participants noticed complex and difficult-to-use steps easily and recognized them as important steps which need to be improved in Kano model. Participants tended to think over the steps which are operated with more physical work.

Table 8: Comparison between the results of the two methods

| Step                  | Quality | Aesthetics Category | Usability Category | Subjective Importance | Peak-End Rule | Kano Model |
|-----------------------|---------|---------------------|--------------------|-----------------------|---------------|------------|
| 1 Plug in the blender | I       | A                   | 0.21               |                       |               |            |
| 2 Put in fruit        | I       | I                   | 0.30               |                       |               |            |
| 3 Position the container | I     | I (A)               | 0.30               |                       |               |            |
| 4 Position the upper cover | I      | O                   | 0.61               | -0.262**              |               |            |
| 5 Low speed           | I       | I                   | 0.24               |                       |               |            |
| 6 Turn on 1           | I       | I                   | 0.27               | 0.309**               |               |            |
| 7 Stop1               | I       | I                   | 0.21               | 0.692**               |               |            |
| 8 High speed          | I       | I                   | 0.21               |                       |               |            |
| 9 Turn on 2           | I       | I                   | 0.18               |                       |               |            |
| 10 Stop2              | I       | I                   | 0.15               |                       |               |            |
| 11 Remove the upper cover | I     | O                   | 0.48               | -0.711**              |               |            |
| 12 Pour the juice into the glass | I       | O                   | 0.45               |                       |               |            |
| 13 Clean the container | I     | O                   | 0.67               | 0.396*                |               |            |
| 14 Unplug the blender | I       | I                   | 0.15               |                       |               |            |
| 15 Return to the original position | I      | I                   | 0.18               |                       |               |            |

Note. Subjective importance represents the proportion of participants who thought that the step was important. The figures presented in the regression columns are the significant beta values.
On the other hand, in the analysis of immediate and retrospective satisfaction, the “turn on” and “stop” steps were found to be significant, but in the Kano model, they were categorized as indifferent qualities and thus ignored. However, “turn on” was the step for which most participants reported their highest peak and the “stop” was the step just related to the same button. As we know, the “turn on” and “stop” which users just press the button do not involve much physical work, but it really provides visual and audio stimuli to people. We believed that the peak-end rule extracts the hidden emotions from the users’ mind. It can reflect the important emotional changes in the user experience which can form the memory.

It is clear that utilizing these two approaches can highlight different aspects of the user experience. A step ignored by the first approach may be an important step in the second approach and vice versa. Thus, we suggest that these two assessment approaches be integrated for the product-use process to extend the understanding of a product. Utilizing both methods can compensate for their individual flaws and produce more complete results by harnessing the emotional component of the peak-end rule, which directly reflects the emotions and satisfaction of the users, and the practical usage component of the Kano model, which provides important information about product qualities. The integrated research results can thus allow a designer to more easily improve a target product.

6. CONCLUSION

This study applied the peak-end rule and the Kano model to assess user satisfaction in the product-use process. We clarified the similarities and differences between the two assessment approaches and found that both were useful for analyzing a product experience. The individual characteristics of the peak-end rule and the Kano model were identified for possible integration in the assessment process for more robust results. Peak-end rule can extract the important steps from the use experience based on emotional aspect, but Kano model can reflect the important steps operated with more physical work during the experience. We believe that integrating the results of these two methods can provide clear information regarding individual product-use steps that designers can employ to thoroughly understand the user experience.

REFERENCES

1. Hassenzahl, M., and Tractinsky, N.; User experience – A research agenda, Behaviour and Information Technology, 25(2), pp.91-97, 2006.
2. Hassenzahl, M., Diefenbach, S., and Göritz, A.; Needs, affect, and interactive products – Facets of user experience, Interacting with Computers, 22(5), pp.353-362, 2010.
3. Desmet, P., and Hekkert, P.; Framework of product experience, International Journal of Design, 1(1), pp.57-66, 2007.
4. Hirschman, E.C., and Holbrook, M.B.; Hedonic consumption: emerging concepts, methods and propositions, Journal of marketing, 46(3), pp.92-101, 1982.
5. Jordan, P.W.; Designing pleasurable products: An introduction to the new human factors, CRC press, 2002.
6. Kahneman, D.; Objective happiness, Well-being, The Foundations of Hedonic Psychology, 3(25), pp.1-23, 1999.
7. Kahneman, D.; Thinking, fast and slow, Macmillan, 2011.
8. Kahneman, D., Fredrickson, B.L., Schreiber, C.A., and Redelmeier, D.A.; When more pain is preferred to less – Adding a better end, Psychological Science, 4(6), pp.401-405, 1993.
9. Knudsen, C.; Ikea and the peak-end rule: How to secure that last impressions are lasting impressions, The Consumer Behavior Newsletter, 27, pp.3-9, 2017.
10. Nagamachi, M.; Kansei engineering: a new ergonomic consumer-oriented technology for product development, International Journal of Industrial Ergonomics, 15(1), pp.3-11, 1995.
11. Yanagisawa, H.; Kansei quality in product design, In; Emotional engineering, Springer, pp.289-310, 2011.
12. Schütte, S.; Designing feelings into products: Integrating Kansei engineering methodology in product development, Quality and Human-Systems Engineering Department of Mechanical Engineering, Linköping University, Thesis No. 946, 2002.
13. Kano, N., Seraku, N., Takahashi, F., Tsuji, S.; Attractive quality and must-be quality, Journal of The Japanese Society for Quality Control, 14(2), pp.147-156, 1984. (in Japanese)
14. Berger, C., Blauth, R., and Boger, D.; Kano’s methods for understanding customer customer-defined quality, Centre for Quality Management Science, 17(1), pp.66-88, 1993.
15. Sauerwein, E., Bailom, F., Matzler, K., and Hinterhuber, H.H.; The Kano model: How to delight your customers, International Working Seminar on
Production Economics, pp.313-327, 1996.

16. Huiskonen, J., and Pirttilä, T.; Sharpening logistics customer service strategy planning by applying Kano’s quality element classification, International Journal of Production Economics, 56-57, pp.253-260, 1998.

17. Matzler, K., and Hinterhuber, H.H.; How to make product development projects more successful by integrating Kano’s model of customer satisfaction into quality function deployment, Technovation, 18(1), pp.25-38, 1998.

18. Ting, S.-C., and Chen, C.-N.; The asymmetrical and non-linear effects of store quality attributes on customer satisfaction, Total Quality Management, 13(4), pp.547-569, 2002.

19. Chen, C.-C., and Chuang, M.-C.; Integrating the Kano model into a robust design approach to enhance customer satisfaction with product design, International Journal of Production Economics, 114(2), pp.667-681, 2008.

20. Do, A.M., Rupert, A.V., and Wolford, G.; Evaluations of pleasurable experiences: The peak-end rule, Psychonomic Bulletin and Review, 15(1), pp.96-98, 2008.

21. Cockburn, A., Quinn, P., and Gutwin, C.; The effects of interaction sequencing on user experience and preference, International Journal of Human-Computer Studies, 108, pp.89-104, 2017.

22. Strijbosch, W., Mitas, O., van Gisbergen, M., Doicaru, M., Gelissen, J., and Bastiaansen, M.; From experience to memory: On the robustness of the peak-and-end-rule for complex, heterogeneous experiences, Frontiers in Psychology, 10, 2019.

23. Miron-Shatz, T., Stone, A., and Kahneinan, D.; Memories of yesterday’s emotions: Does the valence of experience affect the memory-experience gap?, Emotion, 9(6), pp.885-891, 2009.

24. Schneider, S., Stone, A.A., Schwartz, J.E., and Broderick, J.E.; Peak and end effects in patients’ daily recall of pain and fatigue: A within-subjects analysis, Journal of Pain, 12(2), pp.228-235, 2011.

25. Seta, J.J., Haire, A., and Seta, C.E.; Averaging and summation: Positivity and choice as a function of the number and affective intensity of life events, Journal of Experimental Social Psychology, 44(2), pp.173-186, 2008.

26. Tontini, G.; Deployment of customer needs in the QFD using a modified Kano model, Journal of Academy of Business and Economics, 2(1), pp.103-115, 2003.

27. Chaudha, A., Jain, R., Singh, A.R., and Mishra, P.K.; Integration of Kano’s model into quality function deployment (QFD), International Journal of Advanced Manufacturing Technology, 53, pp.689-698, 2011.

28. Watson, D., and Tellegen, A.; Toward a consensual structure of mood. Psychological Bulletin, 98(2), pp.219-235, 1985.

29. Ho, M.-X., and Chen, H.-J.; Research on emotional fluctuations and satisfaction in the product using process, The International Conference on Kansei Engineering and Emotion Research, 2020.

30. Sonderegger, A., Zbinden, G., Uebelbacher, A., and Sauer, J.; The influence of product aesthetics and usability over the course of time: A longitudinal field experiment, Ergonomics, 55(7), pp.713-730, 2012.

31. Baumeister, R.F., Bratslavsky, E., Finkenauer, C., and Vohs, K.D.; Bad is stronger than good, Review of General Psychology, 5(4), pp.323-370, 2001.

32. Vaish, A., Grossmann, T., and Woodward, A.; Not all emotions are created equal: The negativity bias in social-emotional development, Psychological Bulletin, 134(3), pp.383-403, 2008.

33. Sels, L., Ceulemans, E., and Kuppens, P.; All’s well that ends well? A test of the peak-end rule in couples’ conflict discussions, European Journal of Social Psychology, 49(4), pp.794-806, 2019.

34. Fredrickson, B.L.; Extracting meaning from past affective experiences: The importance of peaks, ends, and specific emotions, Cognition & Emotion, 14(4), pp.577-606, 2000.

35. Bastiaansen, M., Lub, X.D., Mitas, O., Jung, T.H., Ascenção, M.P., Han, D.-I., Moilanen, T., Smit, B., and Strijbosch, W.; Emotions as core building blocks of an experience, International Journal of Contemporary Hospitality Management, 31(2), pp.651-668, 2019.

36. Sauerwein, E.; Experiences with the reliability and validity of the Kano-method: Comparison to alternate forms of classification of product requirements, Transactions of the 11th Symposium on QFD, 1999.