A change of perspective

The influence of camera angles on product evaluation

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Abstract

The study presented here examines the influence of camera angles on the evaluation of eight different products. This research extends on previous research by taking horizontal camera angles into account, in addition to vertical camera angles. The previously found beneficial effects of low camera angles on product evaluation were not found in this study. Vertical camera angles had no significant effect on perceived product quality. Furthermore, changes on horizontal camera angles per se did not have an influence. However, multiple interesting interactions were found between vertical and horizontal camera angles and between camera angles and products; that is, different camera angles were preferred for different products. Most interestingly, product type had a significant influence on all factors. This study shows that prior knowledge and a product's unique features have a greater influence on product evaluation than camera angles.

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Introduction

For decades, researchers have tried to shed some light on the influence of camera angles on evaluations of people (see for example Kraft, 1987; Huang, Olson & Olson, 2002; Mignault & Chaudhuri, 2003) and, more recently, of products (see for example Meyers-Levy & Peracchio, 1992; Peracchio & Meyers-Levy, 1997 & 2005). In the real world, objects we look up to are generally evaluated positively, whereas objects we look down on are generally evaluated negatively. Objects that are above eye-level tend to be relatively dominant, powerful and superior, whereas objects that are below eye-level are subordinate, weak and inferior. Camera angles can induce the impression of looking up or looking down at an object, by photographing an object from below or above respectively and can therefore influence how people see and evaluate products. Marketers use these techniques in order to create the best possible impression of the product they try to sell.

Thus far, research on camera angles has only focused on vertical camera angles (y-axis) and on products shown straight from the front side, but there are of course more dimensions. Changes on these dimensions may also have interesting effects on the evaluation of products. For example, simple changes on the horizontal dimension (the x-axis) can give important information about depth. In advertising practice, pictures of products shown somewhat from the side (oblique angles) are frequently used, for example on websites of online stores, but the effects of such camera angles have not yet been studied empirically. This study extends on previous research by taking changes on the x-axis into account, in addition to changes on the y-axis. In order to study the effects of vertical as well as horizontal camera angles on product evaluation, photos of eight different products will be used. On the y-axis, photographs will be taken from a high angle, a low angle and at eye-level. On the x-axis, pictures will be taken from the left, the right and the front side of a product.

Product evaluation and the y-axis

Changes on the y-axis have been shown to influence evaluation of people and objects. Kraft (1987), for example, found that vertical camera angles influenced subjects' evaluation and retention of a set of pictorial events. Specifically, subjects evaluated the characters and objects that were shown least favorably when seen from a high angle, moderately favorably when seen at eye-level and most favorably when seen from a low angle.

Meyers-Levy and Peracchio (1992) demonstrated the effects of (vertical) camera angles in an advertising context. They investigated the effect of camera angles on the evaluation of a personal computer. As was to be expected, based on previous findings, they found that the computer was evaluated least favorably when it was viewed from a high angle looking down at the product. When the computer was viewed at eye-level, it was evaluated more favorably than when seen from a high angle, but less favorably than when it was viewed from a low camera angle looking up at the product. Thus, Meyers-Levy and Peracchio found that low-angle views yielded more positive product evaluations than high-angle views or views at eye-level.

The Meyers-Levy and Peracchio study (1992) examined the impact of vertical camera angles on the evaluation of only one product. The present study extends on their research by examining the impact of vertical camera angles on the evaluation of eight different products. In line with the findings of Meyers-Levy and Peracchio (1992) and Kraft (1987), that low camera angles have a positive influence on the evaluation of both people and products, it is expected that products seen from a low angle will be evaluated most favorably.

This leads to the first hypothesis about the effect of changes on the y-axis on product evaluation:

Hypothesis 1: Products photographed from a low angle will be evaluated more favorably than products photographed from a high angle or at eye-level.

Product evaluation and the x-axis

Changes on the x-axis have not yet been studied specifically in an advertising context, but studies aimed at investigating canonical views indicate that people may have a preference for off-axis or oblique views.

Blanz, Tarr, Bülthoff and Vetter (1999) investigated viewpoints from which participants would take a photograph if they were using certain objects to illustrate a brochure. Instead of using a fixed set of views, subjects were able to rotate three-dimensional models in real-time. Participants were told that they had to 'give the best possible impression of the objects shown on the screen'. Oblique views were clearly preferred to straight front- or side-views. Verfaillie and Boutsen (1995) also found a preference for oblique views when they investigated the effects of in-depth rotation on 'goodness' ratings for object recognition. Based on these findings, oblique views seem to be preferred over frontal views. Because Blanz et al. (1999) asked participants from which viewpoint they would take a photo, the results do not only imply how a product looks best, but they also imply what a good photo should look like.

In the present study, subjects will be asked to evaluate (photos of) products as well. Based on the findings of Blanz et al. (1999) and Verfaillie and Boutsen (1995) it is expected that oblique angles will be preferred to other angles and that products seen from these angles will be evaluated more favorably. This leads to the following hypothesis:

Hypothesis 2: When a product is photographed from an oblique angle, the product as well as the photograph itself will be evaluated more favorably than when a product is photographed straight from the front side.

Kress and Van Leeuwen (1996) made another suggestion about the influence of changes on the x-axis. They suggest that changes at the horizontal dimension can make a difference when it comes to detachment or involvement. The frontal angle is the angle of maximum involvement and is oriented towards action, because when someone is interacting with a person or object, he or she will usually be in front of this person or object. An oblique angle implies detachment; not being part of the situation. Messaris (1997) also stated that a frontal view implies interaction with people or objects.

These assumptions imply that frontal views will be evaluated as more involved and active, whereas oblique views will be evaluated as more detached and passive. In order to examine these suggestions, the following research question is proposed:

Research question 1: Will frontal views be evaluated as more involved and more active than oblique views?

Combining x-axis and y-axis

In addition to the previously discussed preference for oblique views, Blanz et al. (1999) also found that participants often chose high angles to photograph an object. One explanation for this preference for high, oblique angles concerned information richness. These views present

a high number of visible surfaces of an object and therefore contain more information than other views. This opinion is shared by Verfaillie and Boutsen (1995), in their study of goodness ratings for object recognition. They also found that oblique views were rated as the best views and that these oblique views were often seen from a high angle. They contributed these findings largely to the fact that much information is provided by these views. These findings lead to the second research question:

Research question 2: Will high, oblique camera angles be evaluated as more informative than high frontal angles, low angles and eye-level views?

Blanz et al.(1999) and Verfaillie and Boutsen (1995) attributed their findings to the information richness of high, oblique camera angles. Larsen, Luna and Peracchio (2004) proposed a somewhat similar theory about the effect of vertical and horizontal camera angles on persuasion, using the Resource Matching Hypothesis (RMH) as a theoretical framework.

The RMH is an information-processing model and was developed by Anand and Sternthal in 1989. The RMH states that message processing and persuasion are enhanced when there is a match between the cognitive resources required (RR) for message processing and resources available (AR) for processing the message. The RMH is still being applied to various fields of advertising (see for example Meyers-Levy & Peracchio, 1995; Peracchio & Meyers-Levy, 1997; Anand Keller & Block, 1997; Powell Mantel & Kellaris, 2003).

Based on the work of Marr (1982), Larsen et al. (2004) stated that objects exist in visual memory as prototypes. This prototype will usually be a straight frontal view of the object. The more a point of view deviates from this prototype, the higher the resources required for processing will be. If less resources are required than are available (RR > AR), deviations from the prototypical point of view will enhance persuasiveness of the image up to the point where the resources required match the resources that are available (RR = AR). Greater deviations from the prototype will result in resource imbalance, such that the resources required exceed the resources that are available (RR > AR) and the persuasiveness of the image will be reduced (Larsen et al., 2004). The assumption that deviations from a prototypical point of view will enhance persuasion is interesting for the present study. A closer look will be taken at this assumption.

At first glance, the findings of Blanz et al. (1999) and Verfaillie and Boutsen (1995) might seem to support the resource matching theory proposed by Larsen et al. (2004); deviations from the presumed prototype were preferred. However, Blanz et al. also found strong effects of context. Familiarity and functionality were of influence on the preferred views. For example, for most objects, only high-angle and eye-level views were chosen, but not for the airplane, for which low-angle views were chosen too. This seems logical because the airplane was the only object people often see from below. Furthermore, left and right views were chosen equally often but not equally often for each object. Participants preferred different sides for different products. This means that deviations per se do not fully explain the results.

The context effects found imply that there might be a different optimal camera angle for every product, depending on its unique features and function; object recognition may be influenced by views that people see most often, which will usually be the views that are relevant for how an object is used. People often see objects from a specific viewpoint that corresponds with the functionality of that object, that is, when interacting with that object we see the object from a specific viewpoint that allows interaction.

Because familiarity and functionality are important and preferred views seem to be dependent on these factors, an interaction is expected between preferred camera angles and the products used in the present study; that is, different angles may be preferred for different

(types of) products. For example, some products (like a microwave) need to be preset. Standing in front of such a product will facilitate presetting, because buttons and displays can be fully seen. Thus, frontal views may be preferred for this type of product. Other products do not necessarily have to be seen frontally in order to use them or may not even have a clear front side (like a waste bin). For these products, oblique views may be preferred. This means that preference for camera angles depends on the type of product that is on display. This leads to the third research question:

Research question 3: Will there be a Camera angle x Product interaction for product evaluation, such that:

- for products with an interface, frontal views will be evaluated more favorably than oblique views?
- for products without an interface, oblique views will be evaluated more favorably than frontal views?

Conclusion

Based on the research described above, there don't seem to be clear-cut rules when it comes to the perfect camera angle. Familiarity and functionality seem to be important factors. This means that there might be a different optimal camera angle for every product, depending on its unique function and features. It must be said, however, that the research described was not aimed directly at advertising. Therefore, these notions need to be tested in an advertising context. The current study is dedicated to finding out which angles are preferred and if different angles are preferred for different products and claims.

Method

Participants

In order to examine the hypotheses and research questions presented above, an experiment was conducted in which 165 subjects participated (63 men, 102 women). Participants were between 18 and 40 years of age (M = 20.8; SD = 3.0). All participants were students of a Media Psychology course at the University of Twente. Participants received course credits for their participation.

Stimuli

The eight products used in this experiment were all durables, which means that these products are supposed to last for years (hence 'durable') and that they may cost a considerable amount of money. This type of product was chosen because these products often rely on advertisements with photographs in brochures or on websites. Furthermore, other studies (see Meyers-Levy & Peracchio, 1992) also used durables. Using multiple durables in this study makes it possible to investigate whether previous findings will be replicated for different products.

The products chosen were a microwave oven, a blender, a personal computer, a television, a fan, a bookcase, a waste bin and a side chair. These products can be divided into two categories: products with an interface and products without an interface. Products with an interface are electronics (microwave, blender, personal computer, television and fan) and products without an interface are furniture (bookcase, waste bin and side chair).

Each product was photographed from nine different angles, three positions on the y-axis (high angle, low angle and eye-level) and three positions on the x-axis (left, middle and right). This resulted in a total of 72 different photographs (8 products x 9 angles). Photographs were taken in a fixed setting, to make sure that factors like lighting and shading would be the same in all photos. Products were shown at middle distance, which means that the product is shown in full but with not much space around it. This viewing distance is common in advertising (Kress & Van Leeuwen, 1996). The high-angle and low-angle photos were taken from 18° above and below eye-level. This angle provides a strong camera angle (Kepplinger, 1987) and was chosen to be sure that the effect of camera angles would be clearly visible, but that the angle was not unnaturally extreme. Side views were also seen from an 18° angle. It must be said however, that 18° angles are strong for human faces; it is not yet clear if this angle is also strong for products. Meyers-Levy and Peracchio (1992) used a 40° angle, an angle considered to be extreme for human faces. Such angles are not very common on websites of online stores or in magazines. Photographs taken from a 18° angle, as used in the current study, were very similar, however, to pictures of the same (type of) products that can be found on websites of online stores.

Photographs were 4.58 x 6.11 inch and were presented in the centre of on a 14 inch monitor (photos were 330 x 440 pixels, the monitor 1024 x 768 pixels). All brands and backgrounds were removed from the photographs using Adobe Photoshop, in order to minimize the influence of pre-existing brand opinions. All photographs can be found in Appendix I.

Construction of the questionnaire

Products as well as photographs were evaluated on semantic differential scales, in order to distinguish between opinions about the product and the photo itself, because liking a product

does not necessarily mean liking the photo too.

A questionnaire consisting of 18 semantic differentials was constructed. The differentials chosen for product evaluation were similar to the differentials used in the Meyers-Levy and Peracchio study (1992) and concerned attractiveness, size, superiority, price, solidity, quality, strength, ease of use (for furniture the alternative 'roominess' was chosen because ease of use seemed less applicable to these products) and functionality. Differentials about the photo concerned 'goodness', completeness, complexity, 'interestingness', involvement, activity, amount of information, naturalness and attractiveness of the photo. These differentials were taken from Osgood, Suci & Tannenbaum (1957). Nine questions were asked about the product and nine questions were asked about the photo. Seven answering options were used: 'extremely', 'quite' and 'slightly' on the positive side of the semantic differential, 'extremely', 'quite' and 'slightly' on the negative side of the semantic differential and a 'neutral' option (Osgood, Suci & Tannenbaum, 1957).

Dependent variables

In order to find underlying factors in the questionnaire, a Principal Component factor analysis with Varimax rotation was conducted. The factor analysis revealed four factors. These factors were:

Quality. This factor could be divided in two sub factors, Product quality and Photo quality. Product quality was measured by the semantic differentials expensive-cheap, good quality-bad quality, attractive-unattractive and superior-inferior ($\alpha = .78$). Photo quality was measured by the differentials good-bad, interesting-boring and attractive-unattractive ($\alpha = .88$).

Strength. This factor consisted of the differentials big-small, solid-unstable and strong-weak. However, α increased from .62 to .74 if big-small would be deleted. Because size tells less about quality than solidity and strength, it was decided to remove big-small from this factor.

Activity. This factor was measured by the differentials active-passive, informative-uninformative and involved-detached ($\alpha = .60$).[1]

Realism. This factor was measured by the semantic differentials complex-simple[2], natural-unnatural and complete-incomplete ($\alpha = .49$). The differential informative-uninformative was expected to load on this factor (see research question 2), but instead it loaded on the factor 'Activity'. The factor 'Realism' was excluded from further analysis because α was unacceptably low.

The items 'functionality' and 'ease of use' did not load significantly on any factor and were also excluded from further analyses. The factors Product quality, Photo quality, Strength and Activity were used as variables in the analyses.

[1] Note that the factors Quality, Strength and Activity strongly resemble the three recurring factors that Osgood found: evaluation, potency, and activity (Osgood, Suci & Tannenbaum, 1957).

[2] Higher scores on completeness and naturalness lead to lower scores on complexity and the other way around.

Procedure

The experiment was conducted during Media Psychology classes, in 10 groups of on average 17 participants at one time. Subjects were seated behind a computer and performed the experiment individually. The experiment was embedded in a web environment. Participants were told to start the experiment by clicking on a shortcut icon on their computer desktops and to maximize their screens. After reading the instructions the experiment started.
A photo of a product was shown for 5 seconds after which it disappeared and the online questionnaire was automatically provided. Thus, subjects evaluated each photo directly after viewing it. When all questions had been answered, the next photograph was provided. Participants evaluated eight photographs, one of each product. Each product was shown from a different camera angle, so each participant saw a total of eight different camera angles. Photographs were provided in a randomized order. Because there were 165 participants, each photo was evaluated by approximately 18 participants. Results were automatically stored in an online database. Each experimental session took about 30 minutes. The 10 session were performed in one day. The WebPages that were presented in the experiment (excluding photographs) can be found in Appendix II.

Results

Data were analysed by means of MANOVA with a 3 (y-axis: high, eye-level, low) by 3 (x-axis: left, front, right) by 8 (product: microwave oven, blender, personal computer, television, fan, bookcase, waste bin, side chair) design. The hypotheses and research questions will be discussed in same order as presented in the introduction. Furthermore, additional analyses will be discussed.

Product evaluation and the y-axis

Hypothesis 1: Products photographed from a low angle will be evaluated more favorably than products photographed from a high angle or at eye-level.

The first hypothesis predicted that scores on Product quality would be higher for products photographed from a low angle than for products photographed from high angles or at eye-level. However, no main effect of vertical camera angles on Product quality was found, $F(2, 1248) = 1.68$, $p = .19$.

Product evaluation and the y-axis

Hypothesis 2: When a product is photographed from an oblique angle, the product as well as the photograph itself will be evaluated more favorably than when a product is photographed straight from the front side.

This hypothesis predicted that scores on Product quality as well as on Photo quality would be higher for products photographed from an oblique angle than for product photographed from the front side. No main effects of horizontal camera angles were found on Product quality, $F(2, 1248) = .60$, $p = .55$, nor on Photo quality, $F(2, 1248) = .18$, $p = .83$.

Research question 1: Will frontal views be evaluated as more involved and more active than oblique views?

This research question examined whether scores on Activity would be higher for frontal views than for oblique views. However, no main effects of horizontal camera angles were found on Activity, $F(2, 1248) = .21$, $p = .81$. In addition, the effects of horizontal camera angles on the separate items of 'activity' and 'involvement' were studied. However, no main effects of horizontal camera angles were found on activity, $F(2, 1248) = .69$, $p = .50$, nor on involvement, $F(2, 1248) = .21$, $p = .81$.

Combining x-axis and y-axis

Research question 2: Will high, oblique camera angles be evaluated as more informative than high frontal angles, low angles and eye-level views?

This research question examined whether scores on the item concerning the 'amount of information' would be higher for high, oblique camera angles than for other angles. However, no interaction effects between horizontal and vertical camera angles were found for this item, $F(2, 1248) = 1.47$, $p = .21$.

Research question 3: Will there be a Camera angle x Product interaction for product evaluation, such that:

- for products with an interface, frontal views will be evaluated more favorably than oblique views?
- for products without an interface, oblique views will be evaluated more favorably than frontal views?

This question was analyzed as a 3 (y-axis: high, eye-level, low) by 3 (x-axis: left, front, right) by 2 (product category: furniture, electronics) design. However, no interaction effects between horizontal camera angles and product category were found for Product quality, $F(1,1302) = 1.67$, $p = .19$. In addition, no interaction effect between horizontal camera angles, vertical camera angles and product category, $F(1,1302) = .89$, $p = .47$, was found.

Additional analyses

Effects of vertical angles

Previous research has shown that vertical camera angles had a significant influence on product evaluation. However, the present study did not replicate these findings. Surprisingly, vertical camera angles did not have the expected effect on perceived Product quality. Additional analyses were performed to investigate whether vertical camera angles had an influence on any of the other factors (Photo quality, Strength and Activity).

Although no main effects of vertical camera angle were found for Product quality as hypothesized, additional analyses did reveal significant main effects of vertical camera angle on Strength, $F(2, 1248) = 6.53$, $p = .002$, and on Activity, $F(2, 1248) = 3.36$, $p = .04$. These effects were further analyzed with post hoc Bonferroni tests.

Eye-level views were found to score significantly higher on Strength than high ($p = .002$) or low ($p = .03$) camera angles. Eye-level views obtained a mean score of 9.68 (SD = .11) points, whereas high angles obtained a mean score of 9.13 (SD = .11) points and low angles a mean score of 9.30 (SD = .11) points. The difference between high and low camera angles was not significant ($p = 1.00$).

For Activity, a significant difference between high angles and eye-level views was found ($p = .04$). High angles scored higher (M = 10.88; SD = .16) on this factor than eye-level views (M = 10.31; SD = .15). No significant differences were found between high angles and low angles (M = 10.55; SD = .16), ($p = .79$) and between low angles and eye-level views (($p = .54$).

Interaction effects

The second research question examined whether an interaction between x-axis and y-axis would be found for item concerning 'amount of information'. No interaction effects between horizontal and vertical camera angles were found for this item. In order to find out whether interactions between x-axis and y-axis do not occur at all, or just not for this factor, additional analyses were performed.

Significant interaction effects between x-axis and y-axis did occur for Product quality, $F(2, 1248) = 3.109$, $p = .015$, Photo quality, $F(2, 1248) = 3.765$, $p = .005$, and Activity, $F(2, 1248) = 2.548$, $p = .038$. The interaction effect between x-axis and y-axis for Strength approached significance $F(2, 1248) = 2.305$, $p = .056$. A trend was observed in these data. For low angles, frontal views were preferred for all factors. For eye-level views, oblique views were always preferred and frontal views always obtained the lowest scores on all factors. For high angles, right views were preferred for two factors, Photo quality and Activity, and frontal

views were preferred for the other two factors, Product quality and Strength. Mean scores obtained on each factor are listed in Table 1.

Table 1. Interaction effects between x-axis and y-axis: mean scores and standard errors on each factor

Y-axis	X-axis	Product quality	Photo quality	Activity	Strength
High angle	Left	15.52 (.36)	11.09 (.34)	10.69 (.27)	8.87 (.19)
	Front	16.69 (.37)	12.13 (.35)	10.77 (.28)	9.47 (.20)
	Right	16.59 (.37)	12.19 (.35)	11.19 (.28)	9.03 (.20)
Eye-level	Left	16.75 (.35)	12.19 (.33)	10.60 (.27)	9.93 (.19)
	Front	15.93 (.36)	11.03 (.34)	9.82 (.27)	9.44 (.19)
	Right	16.68 (.35)	11.82 (.34)	10.51 (.27)	9.67 (.19)
Low angle	Left	15.86 (.37)	11.18 (.35)	10.58 (.28)	9.14 (.20)
	Front	16.45 (.36)	11.69 (.35)	10.90 (.27)	9.53 (.19)
	Right	15.47 (.36)	10.92 (.34)	10.16 (.27)	9.22 (.19)

The third research question examined whether frontal views would be preferred for a group of products with an interface and whether oblique views would be preferred for a group of products without an interface. However, no interaction between camera angles and product category were found for Product quality. To examine whether maybe the categories were too broad and that preference for camera angles is more product specific, an additional analysis was performed, using a 3 (y-axis: high, eye-level, low) by 3 (x-axis: left, front, right) by 8 (product: microwave oven, blender, personal computer, television, fan, bookcase, waste bin, side chair) design.

Indeed, a significant interaction effect was found between horizontal camera angles and products, for Product quality, $F(2, 1248) = 2.27$, $p = .005$. Four products, the waste bin, the blender, the pc and the side chair, obtained the highest scores when seen from the right. Three products, the bookcase, the microwave and the fan, obtained the highest scores when seen from the front. Only one product, the television, obtained the highest scores when seen from the left. Mean scores are listed in Table 2.

Table 2. Interaction effects between product and x-axis for Product quality: mean scores and standard errors

Product	Left	Front	Right
Waste bin	14.10 (.59)	15.07 (.64)	15.25 (.57)
Blender	19.02 (.60)	17.87 (.58)	19.57 (.59)
Bookcase	14.51 (.57)	15.68 (.58)	14.98 (.65)
Microwave	17.48 (.61)	19.33 (.65)	15.83 (.52)
PC	14.42 (.56)	14.20 (.55)	15.38 (.62)
Side chair	15.72 (.56)	15.95 (.57)	16.42 (.61)
Television	19.24 (.56)	18.09 (.63)	18.48 (.61)
Fan	13.84 (.61)	14.68 (.56)	14.06 (.57)

Influence of product

The finding that interactions can occur between camera angles and products, suggests that preferred camera angles are also defined by the product itself. In order to find out how big the influence of a product is, additional analyses were performed. These analyses revealed that the type of product had a significant main effect on scores on all factors (p = .000) but that this influence was different for each factor. For example, the television scored high on Product quality, but low on Strength. For the waste bin, the opposite results were found.

In order to find out more about the influence the type of product had, differences between the two product categories, electronics and furniture, were examined. A 3 (y-axis: high, eye-level, low) by 3 (x-axis: left, front, right) by 2 (product category: furniture, electronics) design was used. However, when using the two categories, the product no longer had a significant influence on all factors. Significant main effects of product category were only found for Product quality $F(1,1302) = 30.40$, p = .000, and Strength, $F(1,1302) = 20,71$, p = .000. Electronics obtained higher scores on Product quality (M = 16.73; SD = .159) than furniture (M = 15.29; SD = .21). However, furniture scored higher on Strength (M = 9.76; SD = .11) than electronics (M = 9.12; SD = .09).

Furthermore, no interaction effects between camera angles and product category were found, whereas a significant interaction effect between x-axis and product type was indeed found when all products were studied separately.

Discussion

This study examined the influence of vertical and horizontal camera angles on the evaluation of eight different products. In summary, findings were not consistent with previous research. None of the hypotheses and research questions were confirmed.

Based on previous research (Kraft, 1987; Meyers-Levy & Peracchio, 1992) it was expected that products photographed from a low angle would be evaluated most favorably. However, vertical camera angles had no significant effect on perceived product quality. Moreover, no beneficial effects of low camera angles were found in any of the additional analyses. Not low angles, but eye-level views were considered to make a product appear strongest and most solid. High angles scored best on the factor Activity, which comprised of the items activity, amount of information and involvement. These results are interesting, since the beneficial effects of low camera angles were widely accepted in previous research. Results of the Meyers-Levy and Peracchio study (1992) clearly indicated a preference for low camera angles. It must be said however, that there are some differences between the Meyers-Levy and Peracchio study and the present study. Meyers-Levy and Peracchio used a very strong camera angle of 40°, whereas an 18° angle was used in the present study. Furthermore, Meyers-Levy and Peracchio do not exactly describe how the photos they used were presented and how big these photos were. The differences in results might be explained by a difference in experimental methods.

Thus far, the effects of horizontal camera angles on product evaluation had not been studied. Based on studies aimed at investigating canonical views it was expected that oblique angles would be preferred (Blanz et al., 1999; Verfaillie & Boutsen, 1995). Furthermore, the suggestion that frontal views are more active and involved than oblique views was examined (Kress & Van Leeuwen, 1996; Messaris, 1997). However, horizontal camera angles per se had no significant effects at all. Changes on the x-axis did interact, however, with changes on the y-axis and with the products, that is, different horizontal angles were preferred for different products. This study is the first to examine interactions between camera angles and products, which has lead to some interesting findings.

Interaction effects between the x-axis and the y-axis were revealed for Activity, Strength, Product quality and Photo quality. For low angles, frontal views were preferred for all factors. For eye-level views, oblique views were always preferred. For high angles, right views were preferred for two factors, Photo quality and Activity, and frontal views were preferred for the other two factors, Product quality and Strength. It is interesting to see that for high angles, two preferences were found, whereas for low angles en for eye-level views only one preference was found. One possible explanation for this difference is that high angles are the only angles from which three surfaces of the product may be seen (front, top and side). Furthermore, it seems that when a product is seen from a high angle and the *product* is evaluated (Product quality, Strength), frontal views are preferred. However, when a product is seen from a high angle and the *photograph* is evaluated (Photo quality, Activity), oblique (right) views are preferred. This means that a beautiful photograph does not equal a beautiful product, at least not for high camera angles. The finding that when a photograph is taken from a high angle, an oblique view is preferred, is in line with the findings of Blanz et al. (1999). When asked from which viewpoint their participants would take a photograph if they were using certain objects to illustrate a brochure, participants often chose oblique, high angles to photograph an object. One explanation Blanz et al. gave for this finding was that high, oblique angles contained most information (Blanz et al., 1999). However, no evidence for this explanation was found in the current study and the exact reason behind these preferences remains unclear.

In addition to the interaction effects that were found between horizontal and vertical camera angles, an interaction effect between horizontal angle and product was found. Four products, the waste bin, the blender, the pc and the side chair, obtained the highest scores on product quality when seen from the right. Three products, the bookcase, the microwave and the fan, obtained the highest scores when seen from the front. Only one product, the television, obtained the highest scores when seen from the left. It is not clear as to why these views were preferred for these particular products. It seems, however, that the preferences are very product specific, since no interactions between horizontal camera angles and products were found when the products were divided into two categories, electronics and furniture.

Another striking finding was the fact that the independent variable 'product' had a significant effect on all factors. This means that the information provided by the product itself was often of more influence than the camera angle that was used. One possible explanation is that the influence of the product has been underestimated in previous research. For example, Meyers-Levy and Peracchio (1992) did not include the product as an independent variable in their data analysis. It seems logical that consumers use information provided by the product to evaluate the product. Blanz et al. (1999) already found that familiarity and functionality of objects had a large influence on preferred views. People possess knowledge about products and they probably use what they know about a certain product while evaluating another product of the same type. Camera angles may be used to enhance certain features, but prior knowledge about a product should not be underestimated. Furthermore, an additional explanation for this finding might be that subjects in this study were all students and students generally have a high 'need for cognition'. Need for cognition (NFC) refers to an individual's natural propensity to think extensively about issues and enjoy engaging in cognition (Cacioppo & Petty, 1982). Meyers-Levy and Peracchio (1992) found indications that people with high NFC were not susceptible to camera-angle effects, whereas people with low NFC were indeed influenced by camera angles. Thus, students may have studied the product and its unique features, leading to less susceptibility to camera angle effects. In summary, knowledge and the willingness to use it seem to have more influence than camera angles.

This study examined the influence of nine different camera angles on product evaluation. The introduction of this article was concluded by saying that there do not seem to be clear-cut rules regarding the perfect camera angle. That conclusion turns out to be true. Preferences for certain camera angles depend on many factors. This study has shown that low camera angles are not necessarily better than other angles, that oblique angles are not per se preferred and that multiple interactions effects may occur. This study also shows that camera angles are not the only factor influencing product evaluation. Consumers seem to look at specific features of a product and compare what they see to what they already know when they evaluate a product. Some camera angles may be preferred over others, but the influence of the product itself should definitely be taken into account. These findings offer new challenges for future research. For example, studying different models of one type of product may provide interesting information about why certain angles are preferred for a certain type of product. Using unfamiliar products may also provide insightful information, since participants will have no prior knowledge to help evaluate these products. It is possible that camera angles will have more influence when people have no prior knowledge to rely on and that the more one knows about a product, the less influence camera angles will have on product evaluation. Furthermore, future research will have to examine whether results will be replicated when photographs are embedded in an advertising context, such as a website of an online store. Lastly, the question remains whether bigger camera angles have a bigger influence.

In conclusion, this study provides few final answers, but many starting points for future research. However, some important lessons can be learned from this study. There is more to product photography than vertical camera angles alone. Prior knowledge and a product's unique features have great influence on how a product is perceived. Camera angles may not always have such great influence, but they can certainly be used to enhance the right features. A good product will sell itself, but the right camera angle makes it stand out.

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Appendix I: Photographs of products[3] (blender)

High angle, left

High angle, front

High angle, right

Eye-level, left

Eye-level, front

Eye-level, right

Low angle, left

Low angle, front

Low-angle, right

[3] Note: Photographs in the Appendix are 1.83 x 2.44 inch, whereas pictures used in the experiment were 4.58 x 6.11 inch.

Appendix I (continued): Photographs of products (bookcase)

High angle, left

High angle, front

High angle, right

Eye-level, left

Eye-level, front

Eye-level, right

Low angle, left

Low angle, front

Low-angle, right

Appendix I (continued): Photographs of products (fan)


High angle, left


High angle, front


High angle, right


Eye-level, left


Eye-level, front


Eye-level, right


Low angle, left


Low angle, front


Low-angle, right

Appendix I (continued): Photographs of products (microwave)

Appendix I (continued): Photographs of products (PC)

High angle, left

High angle, front

High angle, right

Eye-level, left

Eye-level, front

Eye-level, right

Low angle, left

Low angle, front

Low-angle, right

Appendix I (continued): Photographs of products (TV)

High angle, right

Eye-level, right

Low angle, right

High angle, front

Eye-level, front

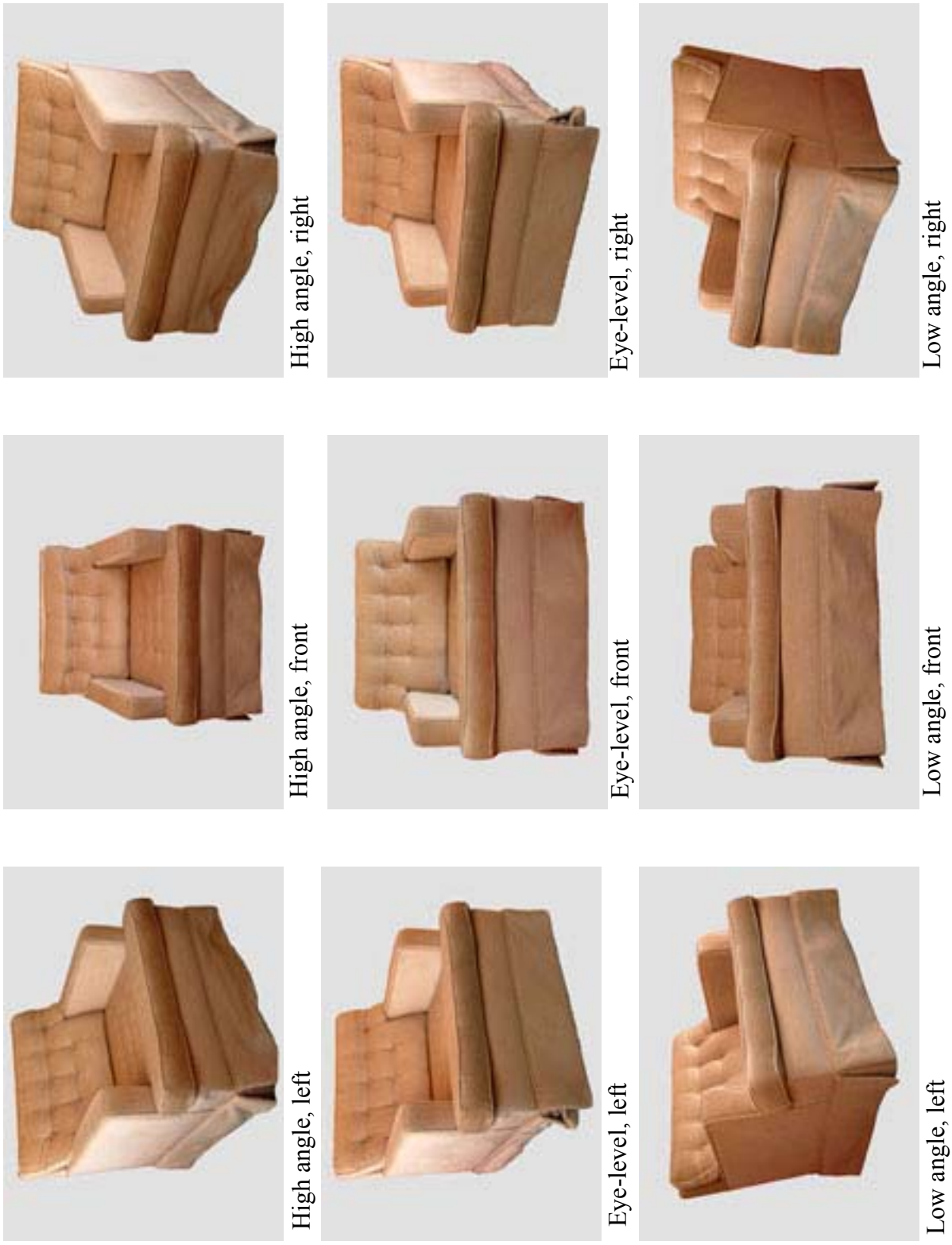
Low angle, front

High angle, left

Eye-level, left

Low angle, left

Appendix I (continued): Photographs of products (side chair)



Appendix I (continued): Photographs of products (waste bin)

High angle, left

High angle, front

High angle, right

Eye-level, left

Eye-level, front

Eye-level, right

Low angle, left

Low angle, front

Low-angle, right

Appendix II: WebPages used in the experiment (Introduction)

Welkom

Welkom bij dit experiment in het kader van het vak Mediapsychologie.
Het experiment zal ongeveer 20 minuten duren.

In reclames, zowel drukwerk als reclame op websites, wordt veelvuldig gebruik gemaakt van foto's om producten aan te prijzen.
In het experiment krijg je acht foto's van verschillende producten te zien.
Na iedere foto volgt een vragenlijst. Er zal zowel worden gevraagd naar je mening over het product als over de foto zelf. In de vragenlijst zal duidelijk aangegeven worden welke vragen over het product gaan en welke vragen over de foto.

Uitleg over de vragenlijst wordt op de volgende pagina gegeven.
Eerst worden nog een paar algemene vragen gesteld.

Algemene vragen

1) Vul in het veld hieronder je *achternaam* in, gevolgd door je *voorletters*.
(Voor bonuspunten voor het vak. De onderzoeksgegevens worden anoniem verwerkt.)

2) Wat is je leeftijd?

3) Ben je man of vrouw?

- (•) vrouw
- ( ) man

4) In welk kader volg je het vak Mediapsychologie?

- (•) Psychologie als hoofstudie
- ( ) Psychologie als tweede studie
- ( ) EDMM
- ( ) HMI
- ( ) Minor
- ( ) Premaster Psychologie
- ( ) Bijvak/ keuzevak/ anders...

5) Heb je interesse in fotografie?

- (•) weinig tot geen
- ( ) ja, want.. (hieronder invullen s.v.p)

Als je klaar bent, klik dan op "Doorgaan" om verder te gaan met het volgende onderdeel.
Krijg je een melding van Internet Explorer, klik dan op 'yes' (continue).

[Doorgaan]

Appendix II (continued): WebPages used in the experiment (Instructions)

Uitleg beoordelingsschaal

Zometeen wordt je gevraagd om je mening te geven over producten en foto's.
Het is de bedoeling dat je je mening geeft op een semantische differentiaal, oftewel, een schaal waarop twee tegenstellingen worden gegeven. Er zijn geen goede of foute antwoorden, want het gaat om jouw mening.

Hieronder zie je een voorbeeld van een vraag zoals die gesteld kan worden in het experiment:

1) Hoe vind je dat het product op de foto eruit ziet?

zeer duur ○ ○ ○ ○ ○ ○ ○ zeer goedkoop

Op deze 7-puntsschaal kun je aangeven in welke mate je vindt dat het product of de foto een bepaald kenmerk heeft. Het middelste rondje betekent "neutraal". De "uiterste waarden" van de schaal worden in tekst weergegeven en horen bij het betreffende buitenste rondje.
De bovenstaande schaal zou je dus als volgt kunnen lezen:

zeer duur | behoorlijk duur | enigzins duur | neutraal | enigzins goedkoop | behoorlijk goedkoop | zeer goedkoop

Klik met de cursor in het rondje van je keuze. Er verschijnt een zwarte stip die jouw keuze aangeeft.
Je kunt deze nog wijzigen indien nodig. Verplaats de cursor naar een volgende vraag of onderdeel.

Let op: de foto verwdijnt na vijf seconden, dus neem de foto goed in je op!

Succes!

Klik op "Doorgaan" om verder te gaan met het volgende onderdeel.

Doorgaan

Appendix II (continued): WebPages used in the experiment (Questionnaire for electronics)

Het product op de foto is:

Aantrekkelijk	○	○	○	○	○	○	○	Onaantrekkelijk
Klein	○	○	○	○	○	○	○	Groot
Superieur	○	○	○	○	○	○	○	Inferieur
Goedkoop	○	○	○	○	○	○	○	Duur
Stevig	○	○	○	○	○	○	○	Wankel
Slechte kwaliteit	○	○	○	○	○	○	○	Goede kwaliteit
Krachtig	○	○	○	○	○	○	○	Zwak
Moeilijk in gebruik	○	○	○	○	○	○	○	Gemakkelijk in gebruik
Functioneel	○	○	○	○	○	○	○	Niet functioneel

Wat voor beeld schetst de foto van het product?

Slecht	○	○	○	○	○	○	○	Goed
Compleet	○	○	○	○	○	○	○	Incompleet
Interessant	○	○	○	○	○	○	○	Saai
Onaantrekkelijk	○	○	○	○	○	○	○	Aantrekkelijk
Actief	○	○	○	○	○	○	○	Passief

De foto is:

Afstandelijk	○	○	○	○	○	○	○	Betrokken
Niet informatief	○	○	○	○	○	○	○	Informatief
Natuurlijk	○	○	○	○	○	○	○	Onnatuurlijk
Eenvoudig	○	○	○	○	○	○	○	Ingewikkeld

Doorgaan

Appendix II (continued): WebPages used in the experiment (Questionnaire for furniture)

Het product op de foto is:

Aantrekkelijk	○	○	○	○	○	○	○	Onaantrekkelijk
Klein	○	○	○	○	○	○	○	Groot
Superieur	○	○	○	○	○	○	○	Inferieur
Goedkoop	○	○	○	○	○	○	○	Duur
Stevig	○	○	○	○	○	○	○	Wankel
Slechte kwaliteit	○	○	○	○	○	○	○	Goede kwaliteit
Sterk	○	○	○	○	○	○	○	Zwak
Krap	○	○	○	○	○	○	○	Ruim
Functioneel	○	○	○	○	○	○	○	Niet functioneel

Wat voor beeld schetst de foto van het product?

Slecht	○	○	○	○	○	○	○	Goed
Compleet	○	○	○	○	○	○	○	Incompleet
Interessant	○	○	○	○	○	○	○	Saai
Onaantrekkelijk	○	○	○	○	○	○	○	Aantrekkelijk
Actief	○	○	○	○	○	○	○	Passief

De foto is:

Afstandelijk	○	○	○	○	○	○	○	Betrokken
Niet informatief	○	○	○	○	○	○	○	Informatief
Natuurlijk	○	○	○	○	○	○	○	Onnatuurlijk
Eenvoudig	○	○	○	○	○	○	○	Ingewikkeld

Doorgaan