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Research Spoilt the Shopping Trip – Comparing the Reactivity of Thinking Aloud and Video-cued Thought Protocols at the Point of Purchase

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Consumers' in-store behaviour calls for a dynamic focus in research; adequate techniques, however, are suspected of altering consumers' actual shopping behaviour. For two process tracing methods (thinking aloud and video-cued thought protocols) the impact on utilitarian and hedonic aspects of shopping was examined in a field study (N = 130) that applied a 3 (method) x 2 (motivation) design. Reactivity was more pronounced in the two process tracing groups than in a control group; nevertheless, video-cued thought protocols produced less reactivity than thinking aloud. This qualifies video-cued thought protocols as a valuable technique for consumer research at the point of purchase.

Keywords: shopping behaviour, point of purchase, process tracing

Track: Consumer Behaviour

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Research on shopping behaviour suffers from two deficiencies. First, only a few studies are conducted in the field, i.e. at the point of purchase. Second, most of the few studies that go into the stores foster a static point of view: Variables are mainly assessed by means of pre- and/or post-measurements – sometimes the point of sale is merely used as another place for distributing questionnaires. This, however, neglects the dynamic processes that underlie consumer behaviour (Jacoby et al., 1994). Hence, consumer research might benefit from conducting more process-oriented research in the field, for instance, by applying techniques that have been developed for tracing consumers' cognitive processes.

A process tracing technique that has already been applied at the point of purchase is *thinking aloud* (e.g. Payne & Ragsdale, 1978; Reicks et al., 2003; Titus & Everett, 1996). It is based on verbal reports: Participants are asked to concurrently verbalize their thoughts while visiting a store. These verbalizations are recorded on tape and are analyzed for consumers' cognitive processes such as search strategies (Titus & Everett, 1996) or purchase decisions (Payne & Ragsdale, 1978) later on. Usually, an observer accompanies the participants in order to make notes on their in-store behaviour and to encourage them to think aloud.

The validity of thinking aloud, however, has been questioned: Verbalizing might commit cognitive resources and hence interfere with the shopping task (Russo, Johnson, & Stephens, 1989). To overcome this problem, *video-cued thought protocols* have been proposed as alternative technique (Silberer, 2005): After giving consent, participants are followed by a cameraperson who records their behaviour in the store; the resulting video is then presented to the participants afterwards and they are asked to comment it with the thoughts they remember from the shopping episode. Collecting verbal reports retrospectively eliminates the reactivity that results from verbalizing concurrently; nevertheless, the technique introduces another problem: reactivity due to the camera observation.

Previous research has demonstrated that both techniques can provide interesting and unique insights into consumers' shopping behaviour (Büttner & Silberer, in press; Payne & Ragsdale, 1978; Titus & Everett, 1996); reactivity as a potential threat to validity, however, has not been systematically investigated. With the research presented here, we focus on this blind spot and address three issues: First, we present recent modifications of thinking aloud and video-cued thought problems that aim at improving these techniques; second, we develop a theoretical framework to explain the reactivity of both methods; finally, we empirically examine the reactivity in a field study. The underlying motivation is to provide more elaborate knowledge on the strengths and weaknesses of methods that consumer research can apply at the point of purchase.

Modifications of Video-cued Thought Protocols and Thinking Aloud

Up to now, the footage for video-cued thought protocols has been collected by a cameraperson who followed the participant (Silberer, 2005). We decided to replace the cameraperson by a small digital video camera that is mounted on the participants' head via a baseball cap and records the shopping episode from the participants' point of view. Omodei, McLennan, and Wearing (2005), who have used head-mounted cameras in field research with firemen, argue that the "own-point-of-view-perspective" is a very powerful stimulus for the recall setting. The head-mounted camera will also reduce reactivity: As the camera "is out of sight, it is out of mind", and thus self-awareness is less pronounced (Omodei et al., 2005).

Such a head-mounted camera can also be used for thinking-aloud: The camera replaces the observer who is taking notes on participants' behaviour; furthermore, participants' verbalizations can be recorded in the audio track of the video. However, this

does not solve the problem that participants might stop verbalizing while walking alone through the store. Hence, we additionally equip participants with a cell phone: they are asked to imagine phoning with a friend and to verbalize everything that goes through their head while walking through the store. In fact, participants are connected with a member of the research team who encourages them to continue verbalizing whenever they stop for a certain period. We think that such a situation is more naturalistic than the usual thinking aloud procedures and thus will produce less cognitive load.

To sum up, in our variant of video-cued thought protocols participants wear a head-mounted camera that records the shopping episode. Afterwards, participants watch the video and comment it with the thoughts they remember. In the thinking aloud procedure, they also wear the head-mounted camera, but verbalize their thoughts concurrently while shopping; this is stimulated and supervised via a cell phone. Both techniques result in a video of the shopping episode that has participants' comments on the audio track.

A Theoretical Framework for Explaining and Predicting Reactivity

In their comprehensive treatise on thinking aloud and retrospective verbal reports, Ericsson and Simon (1993) have stressed that verbal reports are subject to the limits of the cognitive system. They have elaborated the crucial role of short-term memory: Only those thoughts are reportable that are available in short-term memory or can be retrieved from long-term memory. This confines valid verbal reports to conscious cognitive processes (Wilson, 2002). Moreover, it implies that the limited capacity of short-term memory and attention imposes constraints on performance (Styles, 2006).

We adopted these basic premises for our analysis and focus on the cognitive load produced by the methods. Drawing onto research on attention and dual-task performance, we distinguish between primary and secondary tasks (Styles, 2006). In the case of consumer in-store behaviour, the primary task is the shopping process; this includes processes such as wayfinding, thinking about budget, or deciding between brands. Our secondary tasks are caused by examining this primary task. The essential secondary task of thinking-aloud is *verbalizing concurrently*. This covers the processes that occur from perceiving thoughts to the verbal encoding (Ericsson & Simon, 1993). Empirical results on thinking aloud in the laboratory show that verbalizing might indeed impair the performance of primary tasks such as problem solving (Russo et al., 1989) and interacting with software (van den Haak, de Jong, & Schellens, 2003).

While the interplay between primary task and verbalization has already been addressed in research on verbal reports (for a review, see Ericsson & Simon, 1993), another secondary task has been neglected: *processing social information*. Usually, this is not a task explicitly asked for by the instructions; it is, however, implicitly inherent in many research settings. For instance, usual procedures of thinking aloud as well as video-cued thought protocols involve the use of observers or cameras. Self-awareness theory posits that under conditions that involve an obvious social presence – such as an audience or a camera – individuals will direct their attention inwards and compare themselves to social standards (Fenigstein, Scheier, & Buss, 1975). This public self-awareness affects behaviour in two ways. First, consumers will conform to the (anticipated) expectations and norms of others. Consumer research has demonstrated that this affects consumers' in-store behaviour (Dahl, Manchanda, & Argo, 2001; Luo, 2005). Second, the processing of social information binds cognitive resources, thereby impairing the primary task. Research from social psychology on social facilitation suggests that this process is responsible for suboptimal performance in complex tasks when an audience is present (Bond & Titus, 1983).

In sum, having to verbalize as well as acting in the presence of others can impair the primary task, i.e. consumers' shopping behaviour. As attentional resources are limited, we

assume that these effects are additive. But how does an impaired shopping trip manifest itself? In terms of utilitarian aspects, i.e. accomplishing "the particular consumption need stimulating the shopping trip" (Babin, Darden, & Griffin, 1994, p. 646), this is straightforward: Because of the interfering secondary tasks, consumers will be less efficient in reaching their shopping goals, e.g. they need more time to locate products or they make suboptimal decisions. Recent research, however, has stressed that there is more to shopping than being an efficient shopper: Consumers also visit stores for the hedonic shopping value, i.e. the emotional benefit they experience (Babin et al., 1994). We assume that the processes outlined above impair the hedonic shopping value by two ways: First, being unsuccessful in reaching a goal elicits negative emotions (Carver & Scheier, 2001). Second, the attentional conflict that results from the task interference produces arousal (Bond & Titus, 1983); though arousal can enhance consumers' in-store experience in certain situations (Donovan & Rossiter, 1982; Kaltcheva & Weitz, 2006), it will result into a more negative emotional experience in this context because participants attribute it to the research setting.

Although our modifications of thinking aloud and video-cued thought protocols are supposed to reduce reactivity, the influence of verbalizing and processing social information will not vanish completely. Participants who are thinking aloud by phone still have to verbalize their thoughts. Social influence still plays a role in both conditions because participants might feel observed by other customers that wonder about the head-mounted camera.[1] Hence, we derived the following hypotheses from our theoretical framework:

H1: Wearing a head-mounted camera increases public self-awareness; as this binds cognitive resources, it impairs the (a) utilitarian and the (b) hedonic quality of the shopping trip.

H2: Thinking aloud binds cognitive resources and hence impairs the (a) utilitarian and the (b) hedonic quality of the shopping trip.

We conducted a field study to examine these hypotheses. Furthermore, we wanted to analyze whether these effects occur invariably over different shopping situations or are moderated by consumers' utilitarian vs. hedonic motivational orientation (Kaltcheva & Weitz, 2006).

Method

We applied a 3 (method) x 2 (motivational orientation) between subject design. The method conditions were thinking aloud (verbalizing by phone + head-mounted camera), video-cued thought protocols (head-mounted camera only) and a silent, noncamera control group. Motivational orientation was induced by a shopping task the participants had to solve in a store. In the hedonic condition, the scenario was that participants wanted to bridge the time before meeting some friends by browsing in the CD department. The task in the utilitarian scenario was that they had promised their friends to buy a CD as a present for a friend and entered the store for buying this CD; the title of the CD was provided in the scenario.

The study was conducted in a store for electronic and electrical goods that had a medium sized CD department. Because the shopping goals of actual visitors would have interfered with the experimental tasks, participants were recruited in classroom and by word of mouth. N = 130 individuals participated in the study. Mean age was 24.7 years, 54 % were women, and 90 % were students. They were randomly assigned to one of the experimental groups. After filling out a questionnaire and reading the scenarios, they were fit out with the technical equipment according to the method condition and asked to enter the store where they had act upon the instructions given in the scenario. If they did not return to the entrance

[1] We could have solved this problem by using a completely invisible camera that is hidden in the baseball cap. We opted against this alternative for ethical reasons: bystanding customers should have the possibility to intervene if they felt observed; in our study, however, this did not happen.

within the 15 min as demanded in both scenarios, they were reminded to do so by phone. They filled out a final questionnaire after the shopping episode.

Measures. To reflect utilitarian aspects of shopping, two measures for shopping efficiency were assessed: time spent in the store and asking a salesperson for help (yes/no). For hedonic quality, we asked for emotions experienced during shopping: In a set of eight positive and eight negative emotions, participants could indicate which emotions they had experienced during the shopping episode (yes/no). The number of negative (positive) emotions was used as a measure of negative (positive) emotional experience. Situational public self-awareness was measured using a German version of the Feingstein et al. (1975) questionnaire; this questionnaire had been adapted to capture state self-awareness instead of trait self-consciousness (Appel, 2000). Verbal reports were collected during the shopping episode (thinking aloud) or after filling out the final questionnaire (video-cued thought protocols); these data are part of another research project and will not be reported here.

Results

A manipulation check with an adaptation of Kaltcheva's and Weitz's (2006) items (α = .88) showed that the experimental induction of motivational orientation was successful: Participants with purchase goal reported a significant more utilitarian motivation (M = 5.00) than participants with browsing goal (M = 3.04), $F(1, 124) = 104.85$, $p < .001$, $d = 1.76$.

To test the influence of the method on shopping efficiency, the methods groups were compared by planned contrasts with time spent in the store as dependent variable.[2] This analysis was restricted to the utilitarian condition as time spent in the store is no indicator of shopping efficiency in the hedonic condition. A planned contrast (-2 1 1) demonstrated that participants in the control group spent significantly less time (M = 7 min 33 s) in the store than participants in the camera conditions thinking aloud (TA) and video-cued thought protocols (VCTP), $F(1, 62) = 6.67$, $p = .006$, $d = 0.69$. The planned contrast (0 -1 1) between TA (M = 10 min 14 s) and VCTP (M = 10 min 0 s) is not significant, $F(1, 62) = 0.04$, $p = .419$, $d = 0.06$, thereby indicating that having to verbalize did not additionally reduce shopping efficiency. As time spent in the store was limited by the instructions, this might be a ceiling effect. Indeed, we found evidence that verbalizing one's thoughts further reduces shopping efficiency: Almost every participant in both camera groups was able to find the CD; however, among those who successfully solved the task, 73% participants in the TA group asked a salesperson, whereas only 41% of the VCTP participants needed help. This effect is significant, phi = .32, $p = .035$ (one-tailed). Hence, the results support both H1a and H2a.

A 3 (method) x 2 (motivational orientation) ANOVA with number of negative emotions as dependent variable yielded a significant main effect for the factor method, $F(2, 124) = 4.74$, $p = .010$, and a significant interaction, $F(2,124) = 6.99$, $p = .001$. Because of the interaction effect, we tested the planned contrasts separately within the two motivation groups. Within the utilitarian motivation group, neither of the planned contrast is significant, both $p > .51$. In the hedonic motivation group, TA participants experienced significantly more negative emotions (M = 2.05) than VCTP participants (M = 0.62), $F(1, 124) = 6.14$, $p = .007$, $d = 1.08$. Although the planned contrast (-2 1 1) is also significant, it should not be interpreted: The difference is only caused by the difference between TA and the control group; VCTP and the control group (M = 0.59) are nearly identical, $d = -0.04$. A 3 (method) x 2 (motivational orientation) ANOVA with number of positive emotions as dependent variable

[2] For interval-scaled dependent variables, the influence of the head-mounted camera (H1) was tested by a planned contrast (-2 1 1) between the control group and the two conditions with camera (thinking aloud and video-cued thought protocols). The influence of verbalizing concurrently (H2) was tested as planned contrasts (0 -1 1) between thinking aloud and video-cued thought protocols. These two contrasts are orthogonal and hence equivalent to the main effect of the ANOVA factor "method". Tests one-tailed; effect sizes: Cohen's d.

yielded only a significant main effect for the factor method, $F(2, 124) = 4.37$, $p = .015$. A planned contrast (-2 1 1) shows that participants in the control group ($M = 3.58$) experienced more positive emotions than participants in both camera conditions, $F(1, 124) = 8.66$, $p = .004$, $d = -0.55$. The contrast between VCTP participants ($M = 2.67$) and TA participants ($M = 2.77$) is not significant, $F(1, 124) = 0.09$, $p = .766$, $d = 0.06$. In sum, the results on emotions support H1b: wearing a camera reduces participants' positive experiences. The support for H2b is mixed: having to verbalize deteriorates the shopping experience; this, however, applies only to participants with a hedonic shopping motivation.

A 3 (method) x 2 (motivational orientation) ANOVA with public self-awareness as dependent variable yielded only a significant main effect of the factor method, $F(2, 124) = 10.37$, $p < .001$. A planned contrast (-2 1 1) shows that public self-awareness is lower in the control group ($M = 1.91$) than in both camera conditions, $F(1, 124) = 20.24$, $p < .001$, $d = -0.90$. VCTP ($M = 2.68$) and TA ($M = 2.82$) do not differ significantly, $F(1, 124) = 0.24$, $p = .248$, $d = -0.13$ (planned contrast [0 -1 1]). This supports the assumption that wearing a head camera heightens public self-awareness.

Discussion

We found support for our hypotheses: Wearing a head-mounted camera as well as verbalizing one's thoughts impaired the shopping episode. Both effects work in an additive way: Participants were more affected by the thinking-aloud procedure than by assessing video-cued thought protocols. The differences in public self-awareness imply that the impact of the head-mounted camera can be attributed to processing social information. Although we did not assess this directly, this result also suggests that participants who wear a head-mounted camera exhibit more socially desirable behaviour. The effects are not moderated *per se* by having a hedonic vs. a utilitarian shopping motivation; the impact of verbalizing on negative emotions, however, only occurred when participants had a hedonic shopping motivation.

In sum, the findings argue in favour of our cognitive-load-based model; it seems worthwhile to explore whether the framework can be generalized to examine the reactivity of other field techniques such as observing customers (Silberer, 2006). Further research is also necessary because of the study's limitation to CD shopping: Product category and store type might moderate the effects. However, reactivity is only one facet of validity. Although previous research provides evidence that both thinking aloud and video-cued thought protocols are able to capture cognitive processes (Büttner & Silberer, in press; Ericsson & Simon, 1993; Omodei et al., 2005), the conditions are not fully understood yet – especially in field research.

Keeping these limitations in mind, we shall highlight three contributions to consumer research at the point of sale: First, the study empirically analyzes the impact of reactivity and thus goes beyond the anecdotic evidence reported in the literature (e.g. Reicks et al., 2003). The effect sizes highlight that reactivity is an issue to be aware of and that the triangulation of findings with different – preferably nonreactive – methods is highly desirable in field research at the point of purchase. Second, the study demonstrates that not only utilitarian but also hedonic aspects of shopping suffer from reactivity. While this might be a minor issue in various research settings, it threatens the validity of research that explicitly focuses on consumers in hedonic shopping situations. Finally, at a more specific level, the study demonstrates that assessing video-cued thought protocols produce less reactivity than thinking aloud, thus replicating findings from laboratory research in other domains such as problem solving (Russo et al., 1989) or software usability (van den Haak et al., 2003). This finding qualifies video-cued thought protocols as a valuable alternative for consumer research at the point of purchase.

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