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Video-cued Thought Protocols – A Method for Tracing Cognitive Processes at the Point of Purchase

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The store plays a crucial role in consumer decision making. Many purchases are decided directly on the spot, that is, at the point of sale (Cobb & Hoyer, 1986; Rook, 1987). Hence, management in retailing as well as in marketing needs to know how customers really interact with the store environment and what guides their behavior in the store (Bitner, 1992; Silberer, 1989; see also the keynote address in this volume). One key to success is the atmosphere of a store (Donovan, Rossiter, Marcoolyn, & Nesdale, 1994; see also Crader & Zaichkowsky in this volume). Consequently, various studies have examined the influence of store characteristics such as scent or music on shopping behavior (Chebat & Michon, 2003; Mattila & Wirtz, 2001; see also Allan in this volume).

Despite the common assumption that the processes underlying consumer behavior are dynamic in nature (Bettman, Luce, & Payne, 1998; Jacoby et al., 1994), most research is still conducted using static methodological approaches (Jacoby, Johar, & Morrin, 1998). While certain techniques for tracing process have been established for the laboratory (Simonson, Carmon, Dhar, Drolet, & Nowlis, 2001), studies incorporating such methods at the point of sale are scarce. This situation is unsatisfactory because the point of sale offers a variety of possible stimuli that might exert an influence during the whole shopping episode. Influences and mechanisms that can be established in the lab have to be examined as to whether they are also crucial inside the store or are just part of the “noise” (Simonson, 2005). Hence, if consumer research claims to explain and predict actual shopping behavior, consumer research also has to apply process tracing techniques *in situ*, that is, inside the store.

In this chapter, we will address how process tracing methods can contribute to enhanced knowledge about consumers' cognitive processes while shopping in a store. First, we will discuss process tracing techniques that have hitherto been applied to research on cognitive processes at the point of sale. Then we will present video-cued thought protocols as an alternative technique for tracing consumer cognition in the store. This technique is illustrated by three studies that used video-cued thought protocols. Finally, we will discuss implications for further research and for management in retailing and marketing.

Two other chapters in this volume address related issues. Paulson presents an interview method that deals with re-creating shopping scenarios. Silberer provides a review of methods for recording consumers' behavior in the store.

Traditional Techniques for Tracing Cognitive Processes

Eye-fixation Analysis and Cognitive Processes

Eye-fixation analysis is a process tracing technique that is commonly used in the laboratory. Visual acuity is best in a small region of the visual field, that is, the *foveal* region; this means that eye movements and attention are closely linked (Rayner, 1998). Consequently, eye movements that occur during the visual processing of stimuli can be used as indicators of cognitive processes (Guan, Lee, Cuddihy, & Ramey, 2006). Some studies in consumer research applied eye tracking for such purposes, that is, for analyzing consumer cognition (for a more general discussion of eye tracking in retailing research, see Silberer in this volume). For instance, Russo and Leclerc (1994) identified stages in product choice at shelves by analyzing patterns of eye fixations. Pieters and Warlop (1999) examined the influence of time pressure and task motivation on strategies that consumers use when choosing between brands. Chandon (2002) addressed the relationship between visual attention and memory for brands. Schröder, Berghaus,

and Zimmermann (2005) focused on consumers' search processes in identifying shelf regions that catch consumers' attention.

Among the tracking devices available for measuring eye movement (Rayner, 1998), those that use infrared corneal reflection are most commonly used in consumer research (e.g., Chandon, 2002; Pieters & Warlop, 1999). Due to the restrictions imposed by the technical equipment, eye tracking is hardly feasible in the field. For instance, reflections from lights in the store can impair the measurement of the infrared corneal reflection. Moreover, walking through the store with an eye-tracking device will influence participants' behavior and will draw the attention of other customers as well. Consequently, consumer research has used eye-fixation analysis almost exclusively in the laboratory. Russo and Leclerc (1994) set up a supermarket simulation in the laboratory, and recorded consumers' eye fixations on certain products on shelves by a video camera through a one-sided mirror. The authors report that none of the participants were aware that their behavior was being filmed, but concede that the procedure is not feasible in a real supermarket. Pieters and Warlop (1999), as well as Chandon (2002), used slides as a surrogate for actual shelves. Schröder, Berghaus, and Zimmermann (2005) used eye-tracking at shelves in actual supermarkets. Nevertheless, they concede limitations regarding the reliability of their data because of problems, amongst others, with calibration and data transmission.

In-Store Behavior and Cognitive Processes

Eye-fixation analysis permits the examination of which pieces of information consumers have focused their attention on, but is problematic when trying to infer whether the information really was sought after or processed. Other observation procedures have been developed to capture consumers' information processing in a more straightforward manner. In behavioral

process analysis (Jacoby et al., 1994), researchers observe which of the available pieces of information is sought after by a participant from an information display matrix and analyze this behavior using such parameters as breadth or sequences of the information acquisition. As this kind of technique usually requires a structured decision-making task, its value for “real-world” research at the point of sale is limited (Payne & Ragsdale, 1978).

Using less formalized observations of consumers’ interaction with the store environment, however, might also prove insightful. The approaches and the methods that can be used for observing customers’ in-store behavior are abundant (for an overview, see Silberer in this volume). Consumers’ interactions with products (e.g., touching them, taking them out of shelves) can be used to analyze consumers’ choice processes. For instance, Hoyer (1984) presents results from an observation at a shelf that provide insights into consumers’ deliberation during brand choice.

The observation of navigation behavior can also give clues to cognitive processes. For instance, approach or avoidance behavior can be used as an indicator of positive or negative evaluations of areas in the store, respectively (Bitner, 1992; Donovan et al., 1994). Indirect evidence of a relationship between the way consumers move through the store and attractiveness is presented by Milliman (1982): the results suggest that customers who move more slowly tend to buy more. Certain navigational patterns can also provide clues as to the cognitive processes that underlie orientation in the store: Iyer (1989) found that backtracking, “measured as the motion, in a direction opposite to the forward movement, required to purchase/inspect an item” (p. 47), was more pronounced when consumers visited an unknown store.

In general, however, data assessed by the observation of in-store behavior suffers from ambiguity. For instance, when customers spend a long time contemplating a shelf, this might be

an indicator of their involvement with the product class or simply show that they cannot find what they are looking for. More unequivocal insights into the relationship between in-store behavior and the underlying reasons can be provided by techniques that combine in-store observation and post interviews (Lowrey, Otnes, & McGrath, 2005; Otnes, McGrath, & Lowrey, 1995). Another possibility is to collect thought protocols, that is, customers' verbal reports on their cognitive processes (e.g., Titus & Everett, 1996).

Verbal Reports and Cognitive Processes

When digging deeper into information processing, verbal reports are the "classic" method in research on cognitive processes (for a review see Ericsson & Simon, 1993; Silberer, 2005). Concurrent verbal reports – known as "thinking aloud" – have been frequently used by consumer research in the laboratory (e.g., Bettman & Park, 1980; Kivetz & Simonson, 2000). This kind of reporting requires participants to verbalize their thoughts while performing a task (e.g., choosing between competing brands) and has already been applied in research at the point of purchase. In these studies, data was collected on cognitive processes by asking participants to think aloud while walking through a store; it was typically supplemented by data from observation. Both King (1969) and Bettman (1970) used thought protocols collected from a small number of participants to model consumers' in-store information processing. Payne and Ragsdale (1978) present descriptive analyses of consumers' use of strategies and product attributes during grocery shopping derived from in-store thought protocols. Another study that combined thinking-aloud and observation was conducted by Titus and Everett (1996) to examine the cognitive processes that underlie navigational search behavior at the point of sale. Reicks et al. (2003) used thinking-aloud to examine factors influencing in-store grocery purchase decisions.

The advantage of these verbal reports is that they provide rich, sequential information about cognitive processes (Payne, 1994). However, a crucial argument against them is the reactivity of the method, that is, the underlying cognitive processes might be altered by the procedure of assessing the data (Russo, Johnson, & Stephens, 1989). Although advocates of the thinking-aloud method report results indicating that thinking-aloud slows down the process but does not alter it (Ericsson & Simon, 1993; Payne & Ragsdale, 1978), there is also evidence that reactivity reaches beyond task speed and that the effects are contingent upon the task to be solved (Dickson, McLennan, & Omodei, 2000; Russo et al., 1989; Schooler, Ohlsson, & Brooks, 1993; van den Haak, de Jong, & Schellens, 2003). Research on attention and performance shows that performing two tasks simultaneously results in interferences between the tasks (Pashler, Johnston, & Ruthruff, 2001). The complex tasks involved in shopping (e.g., wayfinding, thinking about needs and budget,), in such a rich environment as a store, can be assumed to require more resources than solving puzzles or making decisions in the laboratory. Consequently, we expect that reactivity due to the interference between the shopping task and the verbalization task are even more pronounced when applying thinking aloud at the point of sale. Indeed, Reicks et al. (2003) mention anecdotic evidence for reactivity on shopping behavior when customers were asked to think aloud.

In addition, there are also problems with thinking aloud at the point of sale that are more mundane. For instance, people may not be used to verbalizing their thoughts and feelings while shopping. Talking about such issues in public might create an awkward situation for them and hinder verbalization. Moreover, practical reasons such as interfering music or loud voices in the store complicate the application of thinking aloud in the store. Finally, thinking aloud is not

applicable for studying customers' social interactions – it would interfere with the normal communication.

Verbal reports can be collected retrospectively to counter these problems (Ericsson & Simon, 1993; Shiv & Fedorikhin, 1999; Wright & Rip, 1980). This eliminates the danger of reactivity, but it fosters the problem of nonveridicality, that is, no or loose correspondence between verbal reports and original processes (Gibbons, 1983; Russo et al., 1989). The first reason is that the thoughts have to be retrieved from long-term memory and hence are prone to forgetting. The results of Fidler (1983) show that retrospective reports are indeed of lower quality compared to concurrent reports. Second, interpretation on the part of the subjects is more likely (Harte & Koele, 1997) and can lead to the fabrication of mental events (Russo et al., 1989). Finally, the sequential order of the verbalized thoughts is less strict and cannot be accurately assigned to the participant's behavior. All these problems become graver with increasing time between the shopping episode and the retrospective verbalization.

Supporting the verbalization with an aid that contains cues to facilitate recall can be a solution (Omodei, McLennan, & Wearing, 2005; Silberer, 2005; see also Paulson in this volume). For this purpose, cueing retrospective reports with video observations of the informants' shopping behavior presents an alternative. We refer to this technique as "video-cued thought protocols" and will discuss it in detail in the remaining sections of this chapter.

Video-Cued Thought Protocols

The Technique

The core idea of video-cued thought protocols is to use a video of the shopping episode as a recall aid when assessing verbal reports on cognitions retrospectively. The technique originates from laboratory research on consumer behavior towards online shops (Silberer, 2000;

Silberer, Engelhardt, & Wilhelm, 2003). Here, the consumer's interaction with an online shop is recorded in a video, either by using a head-mounted camera (Silberer et al., 2003) or software to record the screen content (Büttner, Schulz, & Silberer, 2006). The video is presented to the participants afterwards and paused each time they click on a link to another web page. Participants are then asked to report what they had in mind while surfing the page.[1]

For the use in brick and mortar shops, the technique had to be elaborated because of peculiarities of the shopping environment (Silberer, 2005). The procedure is as follows: an observer follows a customer with a video camera (at a discreet distance) and films the customer's behavior in the store. The participants are informed about the observation for ethical and practical reasons. Directly after the shopping episode, the video is presented to the customer using a laptop as output device. Participants are asked to comment on the video with the thoughts and feelings they can remember from the former shopping episode. In order not to provoke justifications or "false memories" (Russo et al., 1989), the interviewer adopts a nondirective manner and only intervenes by repeating the instructions when the participant stops verbalizing. Both interviewer and interviewee have the possibility to pause the tape if necessary. Video and audio tracks are combined after the interview, resulting in a video tape with the pictures from the original shopping episode and the audio track from the interview. Participants' thought protocols are then coded and analyzed in the laboratory. Moreover, the video can be used to analyze behavioral data. The coding schemes for participants' thoughts and behavior are based on the scope of the research. If the existing coding schemes do not fit the research question, one might either adapt one of them or develop a new one.

Similar techniques have evolved in other domains than consumer research. Kalbermatten (1984) report on a method they call "self-confrontation" (*Selbstkonfrontation*). Video recordings

of behavior are used to elicit verbal comments from the actors in contexts such as teaching, counseling, or sports. Wagner, Uttendorfer-Marek, and Weidle (1977) term their approach "retrospective thinking aloud" (*nachträgliches lautes Denken*). They use video recordings from school lessons that are commented on by teachers or pupils. While these approaches have in common that they record the behavior from the view of an external observer, there are also approaches that use a head-mounted camera to collect videos in naturalistic situations: Odomei and colleagues apply "own-point-of-view recordings" to recall the decision-making of professionals such as firemen (Omodei et al., 2005). In usability research, recordings of the screen content have been used to elicit participants' thoughts on their interaction with software (e.g., Bowers & Snyder, 1990).

In the following, we will address the feasibility and the validity of using video-cued thought protocols for research at the point of sale. Moreover, as the effort for applying video-cued thought protocols is rather high, we will examine whether the technique can yield useful insights for consumer research. We will discuss these issues using results from a study that was conducted in a store for electrical and electronic goods (for details see Büttner, Rauch, & Silberer, 2005). In this study, we focused on differences between browsing visitors and visitors with a particular intent to purchase (study 1, $N = 128$) and explicitly addressed questions of validity. We will support the discussion with an analysis of two other studies, thereby illustrating the variety of research questions that can be addressed using video-cued thought protocols. Study 2 ($N = 48$) examined consumers' in-store purchase decisions in a supermarket (Marienhagen, 2005), whereas study 3 ($N = 66$) focused on couples' shopping behavior in a toy store (Weitemeyer, 2006).

Feasibility

Whether video-cued thought protocols can be used reasonably depends on both the acceptance by the store's management and customers (i.e., the potential participants; Silberer, 2005). In all three studies, the management readily agreed to support the studies. The customers' willingness to participate was also good, although we did not pay any money for participation but handed out small incentives such as candy bars. In all studies, the interviewers approached customers at the entrance to the store. Given the invasiveness of the technique, the participation rates are surprisingly high: 22% of the customers approached by our interviewer in study 1 agreed to participate. The participation rate was even higher in studies 2 and 3: 38% and 29% of those asked respectively agreed to participate. Nevertheless, we expect participation rates to be significantly lower for shopping situations that involve time pressure (e.g. gift shopping before Christmas) or that emphasize the customers' need for privacy (e.g., buying condoms; see Dahl, Manchanda, & Argo, 2001).

The technical equipment – laptop computer, digital video camera, microphone, and software – can be handled easily in the field situation. In study 1, five of the data sets had to be discarded because of corrupt audio tracks. Overall, however, technical problems rarely occurred. We had good experiences with the in-store recording of participants' behavior, although it was not always possible to keep track of all movements exactly. Furthermore, the video compressions (MPEG) that were necessary for archiving after recording the videos did not cause significant delays in the course of the study. They were started while participants filled out a final questionnaire and the compression algorithms used to produce both an acceptable image quality as well as file size do not consume too much time when using up-to-date computers. Certainly, archiving the videos on DVD is an additional yet important aspect, and thoroughly cleaning the

laptop from temporary video files at regular intervals is indispensable because of the large file sizes.

When combining the audio track with the video, the video has to be in the same format as presented to the participant. We achieved this by recording the video presentation itself (i.e., including all pause, rewind, and forward operations) in another video. In the first two studies, we used the video-editing software Pinnacle Studio™ for this purpose. In study 3, we switched to Camtasia Studio™, a software solution for screen recording; the procedure turned out to be even easier to handle. Both procedures resulted in a video that includes the original video in the way it was presented to the participant (video from a video) and a synchronized audio track.

Validity

Threats to Validity. The validity of verbal reports can be jeopardized in two ways – by reactivity and nonveridicality (Russo et al., 1989). *Reactivity* means that the underlying process (i.e., cognitive processes) is altered by assessing it (i.e., by eliciting verbal protocols). Although it is a common finding that reactivity is a minor issue in thinking aloud when carried out properly (Ericsson & Simon, 1993; Payne, 1994), certain results suggest that the effects might be underestimated (Dickson et al., 2000; Russo et al., 1989; Schooler et al., 1993). This should be especially crucial in a field situation where the self-awareness of the informant is higher due to other visitors observing him or her verbalizing. Moreover, having to perform two tasks simultaneously (i.e., shopping and verbalizing) can result in interference between the tasks (Pashler et al., 2001). In a usability study, van den Haak et al. (2003) compared thinking aloud and retrospective video-cued thought protocols. They found participants who were thinking aloud to be less successful in solving tasks. Moreover, verbalizations from the thinking-aloud participants proved less helpful than verbalizations from the video-cued thought protocols in

identifying usability problems. The findings suggest that both the primary and the verbalization task suffer from the interference between them when participants think aloud. The advantage of video-cued thought protocols is that verbalization itself cannot affect the original process because it is done afterwards (Ericsson & Simon, 1980, p. 234). Nevertheless, the problem shifts to the question as to whether filming the subject while shopping alters the external and inner behavior.

Nonveridicality arises when the verbalized process does not correspond to the underlying processes. This might be produced by forgetting or the fabrication of mental events (Russo et al., 1989). Compared to uncued retrospective reports, video-cued thought protocols are less prone to nonveridicality because the video facilitates recall. This assumption is supported by the crucial role that contextual factors play in recalling information from episodic memory (Raaijmakers & Shiffrin, 1992). Moreover, anchoring the verbalization with the video both preserves the sequential order of the thoughts and leaves less room for interpretation, thereby reducing the fabrication of mental events. Guan et al. (2006) provide evidence that fabrication is not very prevalent in cued retrospective reports. They also report results indicating a high level of omissions in cued retrospective reports, but concede that the amount might be greatly overestimated because of differences in the level of abstraction between thought protocols and data on eye fixation.

However, the biggest nonveridicality challenge for all techniques using verbal reports is whether people are really able to report on their mental processes. This has been subject to debate since the early days of psychology (Massen & Bredenkamp, 2005). In German *Denkpsychologie* of the early 20th century, Bühler (1907) favored introspection as a method for the study of thought processes. This view was attacked by Wundt (1907) with the argument that

monitoring one's inner processes is not possible because these processes themselves bind those cognitive resources (i.e., attention) that are necessary for the monitoring.

In the 1970s, Nisbett and Wilson (1977) contended after reviewing various studies that people cannot adequately report on mental processes but, when asked to do so, "construct" these processes by relying on naïve theories. This conclusion has been criticized for several reasons. Ericsson and Simon (1980, 1993), for instance, argue that the studies reviewed by Nisbett and Wilson (1977) cannot provide insight into people's ability to report on their mental processes because they neglect the characteristics of the cognitive system. Ericsson and (1980, 1993) developed a theory for predicting the validity of verbal reports based on characteristics of the cognitive system and argued that verbal reports can produce valid insights when applied properly. One central premise is that people can only report on mental processes that have been conscious, that is, have passed short term memory. The assumption that people have a privileged access to their *conscious inner states* is now also acknowledged by former critics (e.g., Wilson, 2002, p. 106).

If consciousness is a prerequisite for valid verbal reports, then the role of nonconscious processes might limit their applicability. Research on unconscious processes is currently experiencing a *renaissance*: people in general and in their role as consumers have been found to be far more subject to unconscious processes than previously assumed (Bargh, 2002; Dijksterhuis, Smith, van Baaren, & Wigboldus, 2005). There are, however, good arguments to assume that the influence of unconscious processes might be overestimated by current research (Chartrand, 2005; Simonson, 2005). According to Simonson (2005, p. 214), this view is supported by the wide range of phenomena that can be explained by conscious processes (e.g., Payne, Bettman, & Johnson, 1993).

All in all, one has to accept that video-cued thought protocols cannot provide insights into all cognitive processes and thus might be incomplete. However, as Ericsson and Simon (1980) point out, it "does not invalidate the information that is present" (p. 243). Moreover, it is not a sole characteristic of this technique but applies to all other methods as well (e.g., thinking aloud, eye-fixation analysis). Overall, the risk of forgetting and fabrication is less crucial for video-cued thought protocols than for uncued retrospective reports, yet higher than in concurrent thinking aloud. In return, the technique is less invasive than thinking aloud and therefore less prone to reactivity. In uncued retrospective reports, reactivity is even less prominent. These limitations have to be kept in mind when using video-cued thought protocols to examine cognitive processes. As with all research methods, the adequateness of video-cued thought protocols has to be judged with regard to the scope and purpose of the research endeavor.

Testing Reliability and Validity. For verbal reports in general, whether they are collected retrospectively or concurrently, the concept of reliability as founded in the Classical Test Theory is not applicable, because "it is not possible to separate measurement error from the 'true decision' process" (Harte & Koele, 1997, p. 25). Retests with the same subjects are not adequate as this implies that the ongoing process and the corresponding thoughts would be the same. It is evident that such a retest would alter the shopping process as well. As dynamic processes are necessarily inconsistent over time, consistency measures like split-half reliability are not applicable either. Consequently, the concept of reliability is rarely addressed in process tracing research (Harte & Koele, 1997), except for the coding scheme as inter-rater reliability. As this is not an issue concerning the method *per se*, we will drop this issue here and refer to the literature on content analysis (e.g., Krippendorff, 2004; Neuendorf, 2002).

As a first step in assessing validity, we focused on the reactivity resulting from the video observation. In all three studies, most participants indicated that they had been not at all or only slightly disturbed (seven-point rating scale, 1 = not disturbed, 7 = very much disturbed; $M_1 = 2.7$, $M_2 = 2.1$, $M_3 = 2.3$). Younger people felt less disturbed in study 1 and study 2 ($r_1 = -.18$, $r_2 = -.24$, all ps $< .05$); this relationship is of comparable size in study 3 ($r_3 = -.18$, $p = .16$) but not significant because of the smaller sample size. No differences between men and women regarding reactivity were found in any of the studies.

In study 2, we directly probed for perceived changes in participants' shopping experiences. About one third of the participants indicated that they had spent less time in the store because of the video observation. Changes in feelings were reported by 31% of the participants (they experienced some kind of negative feelings or "felt observed"). The perceived changes in other dimensions are less pronounced: 20% examined fewer products, 14% thought less intensively about their purchases, and 11 % indicated that they had purchased fewer products because of the observation. Overall, this suggests that reactivity exists to some degree, but is not a major threat to the validity of video-cued thought protocols.

Testing the validity of verbal reports directly is no trivial task, as it is nearly impossible to find a perfect criterion for validation which is not based on some other form of verbal reports (Russo et al., 1989; for an example see Biehal & Chakravarti, 1989). Many studies use differences in task completion and solution time between different verbalization conditions as indicators (e.g., Dickson et al., 2000; Russo et al., 1989; Schooler et al., 1993). In our study 1, we observed behavior that is supposed to be an indicator for certain cognitive processes as criteria for the verbalized thoughts referring to the same cognitive processes (i.e., product evaluation, decision-making). The correlation pattern between behavior and cognition allowed us

to check for convergent and discriminant relationships (Campbell & Fiske, 1959): the correlations should be high between thoughts and behavior that reflect the same processes and low between thoughts and behavior that pertain to different cognitive processes. For instance, behavior that is an indicator of the product evaluation, such as thoroughly looking at or touching products, was assumed to correlate with verbalized thoughts referring to product evaluation, but not (or at least lower) with thoughts referring to orientation in the store. The correlation pattern in our study turned out to be in accordance with our expectations: 17 out of 21 correlations support the respective convergent and discriminant relationships (Büttner et al., 2005).

A similar approach has been used by Jacoby, Chestnut, Hoyer, Sheluga, and Donahue (1978), but the other way around: they examined the validity of behavioral process data by using verbal protocols. Furthermore, Guan et al. (2006) compared retrospective verbalizations on information processing sequences with observed data on eye fixations. Both studies reflect the results from our study: verbal reports and behavioral process data correspond, but the relationship is not perfect.

A further procedure in proving the validity of verbal reports is to derive a network of relationships between constructs from theory that includes constructs measured by verbal reports (nomological validity). In our study 1, we applied a design which would allow a theory-driven postulation of differences in cognitions between two groups: those who come to the store with a purchase intent and those that come to browse in the store without a particular purchase in mind (Bloch, Ridgway, & Sherrell, 1989). According to the theory of action phases and mind-sets (Gollwitzer, 1990, 1996), we predicted that browsing customers would be more open-minded regarding new information and process information regarding the desirability of certain goals, whereas customers with a purchase intent try to ensure the realization of their chosen goal (the

purchase). These differences are supposed to resurface in differences in the cognitive activities reported in the video-cued thought protocols of the two groups. Five of the seven hypotheses tested are in accordance with these predictions: browsing customers report more thoughts on perceiving alternatives and on evaluating alternatives; customers with a purchase intent report more thoughts on orientation, the selection of alternatives, and problems with achieving their goal (Büttner et al., 2005).

To sum up, the results on convergent and discriminant as well as on nomological validation evidence that video-cued thought protocols can be valid measures of consumers' cognitive processes while shopping in a store. This also implies that nonveridicality and reactivity are not serious threats when applying video-cued thought protocols. Participants' self-reports on reactivity support this conclusion.

Utility

So far, we have reported evidence on the feasibility and validity of the method. But is using the technique also worthwhile? Typically, the effort required for video-cued thought protocols, as with other process tracing techniques, is high. Consequently, we shall discuss further whether video-cued thought protocols can provide insights into consumers' in-store behavior that compensate for the amount of effort required.

In study 1, we addressed the utility of the method by examining whether data provided by video-cued thought protocols can predict one of the pivotal outcomes of the visit to a store: whether a customer buys something or not. Twenty-five percent of the customers with purchase intent did not buy anything. By using logistic regression, we found that data on cognitive processes derived from the video-cued thought protocols can distinguish between those who did act upon their original intention and those who did not (Büttner et al., 2005).[2] The more thoughts

the participants verbalized on the selection of alternatives and on the evaluation of goal achievement, the more likely they were to purchase. While these two predictors are quite obvious, the third predictor reveals more interesting insights: the more thoughts participants reported on searching/perceiving alternatives, the less likely they were to buy. This is consistent with other findings on an inverse relationship between number of options and likelihood to purchase (Iyengar & Lepper, 2000).

In study 2, video-cued thought protocols were collected from shoppers in a grocery store. The protocols were used to analyze shoppers' cognitive processes at the level of individual purchase decisions (Marienhagen, 2005). These purchase decisions were analyzed with regard to reasons for the purchase. Among other results, in-store stimuli were more frequently mentioned as reasons for individual purchases in the thought protocols when customers had less clear ideas about what to buy before entering the store. Moreover, individual purchase decisions were rated with regard to the decision involvement. Most purchase decisions were classified as low involvement decisions based on criteria such as the amount of information processing, interest in the product, or reported social influence. High involvement decisions were found to be most prevalent when customers decided not to buy a product that they had originally planned to purchase. In contrast, nearly all unplanned purchases were classified as low involvement purchases. The variability of involvement during a shopping trip can easily be dismissed when relying only on overall measures: the actual ratio of high involvement compared to low involvement decisions was not reflected in an overall rating of purchase decision involvement.

Study 3 focused on the shopping behavior of couples (Weitemeyer, 2006). Video-cued thought protocols were assessed for the person identified as the "main shopper." While they commented on the video, their shopping partners were asked to listen to a CD using headphones.

After the initial interviewee had finished, the waiting shopping partner watched the video and took the perspective of the initial interviewee: they were asked to comment on the video with the thoughts they believed the initial interviewee had during the shopping episode. We conducted further analyses of the data provided by Weitemeyer (2006) and found that participants can guess their partner's thoughts at least to some degree: concordance ranges from 5% to 45% (M = 18%). The partner also plays an important role during the shopping trip: about 9% of all verbalized thoughts refer to the shopping partner. The results from this exploratory study highlight that video-cued thought protocols have the potential to give interesting insights into the interpersonal processes that underlie shopping behavior.

Conclusions and Outlook

The range of phenomena that can be examined using video-cued thought protocols is wide. Some of those, such as in-store decision-making (King, 1969; Payne & Ragsdale, 1978) or search and navigation behavior (Titus & Everett, 1996), have already been studied using thinking aloud. Here, video-cued thought protocols present an alternative to the problematic thinking aloud method. A further research area for which video-cued thought protocols might be particularly valuable is the study of social interaction at the point of purchase. Thinking aloud is by no means reasonable for this purpose, because it would interfere with the normal communication. Moreover, the video has an important benefit – it can be analyzed for nonverbal behavior.

Nevertheless, methodological aspects remain on the research agenda; scrutinizing the influence of the video observation on customer's behavior and identifying corresponding moderators, such as type of product or shopping orientation, appear at the top of the list. Testing other ways of generating videos for recall, such as a head-mounted camera that records from the

participant's point of view (Belk & Kozinets, 2005; Omodei et al., 2005) offers further interesting perspectives – both at the methodological and theoretical level.

The use of video-cued thought protocols, however, is not restricted to academic research; management in marketing and retailing can benefit from data generated by video-cued thought protocols as well. Data on cognitive processes that are supplemented with data derived from the video recordings on consumers' paths and interaction behavior (see Silberer in this volume) can draw a more complete picture of the interplay between shoppers and store environment than data provided by static methodologies. Retailers can use it for diagnostic purposes, for instance, when testing store designs or promotions.

Video-cued thought protocols can be combined with other techniques for studying shopping behavior. For instance, Otnes, McGrath, and Lowrey (1995; see also Lowrey et al., 2005) have developed a procedure for shopping with consumers that diligently integrates steps such as multiple shopping trips and interviews. The rapport that can be established when applying such a multi-step framework facilitates the use of a video camera. Within this approach, video-cued thought protocols could replace the manual notes of observations and verbalizations during the shopping episode. Moreover, the video could be used by the researcher to generate questions for later in-depth interviewing.

The latter example also highlights another issue: although developed within the information processing paradigm, video-cued thought protocols can be used within interpretive paradigms – the main difference is the way in which the material is analyzed. Especially in ethnographic research, video records of consumer behavior are highly valued both as data (Belk, Wallendorf, & Sherry, 1989) and as a way of communicating results (Belk & Kozinets, 2005). Using the same material (i.e., the video from the shopping episode) by researchers from different

paradigms may help bridge the often lamented gap between positivist and interpretive approaches in consumer research (Otnes et al., 1995; Simonson et al., 2001) and provide a richer understanding of shopping behavior in brick and mortar stores.

Overall, the preceding analysis leads to an optimistic conclusion: video-cued thought protocols are a promising technique for research at the point of purchase. The technique is feasible in the field situation in the store, and, more importantly, it provides insights into consumers' cognitive processes that are both valid and useful.

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Footnotes

[1] The focus of this chapter is on applying the technique in brick and mortar retailing. For more detailed discussions and illustrations of using the technique in online environments, see Silberer (2000), Silberer, Engelhardt, and Wilhelm (2003), or Büttner, Schulz, and Silberer (2006).

[2] The analysis is restricted to the purchase intent group because the number of browsing customers who purchased a product was too small to conduct reasonable analysis.