The Interaction of Individual and Universal Online Shopping Scripts

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Abstract

This article employs cognitive script theory to examine a typical online shopping procedure from a customer's point of view. Individual scripts gained from interviews held with 8 experienced online shoppers reflect a high degree of personal preferences in the order of actions, decisions, and events associated with online shopping. Designing an online shop according to an average online shopping script built on such data might fail to meet the expectations of each individual customer. Two surveys employing ratings for typicality and position of script actions look into common elements of reported scripts, individual derivations, and the interaction of both. Proximity data derived from position ratings is analyzed via cluster analysis and the Pathfinder network model (Dearholt & Schvanefeldt, 1990). Results reveal groups of actions that can be interpreted as scenes within the proposed online shopping script. Individual deviations affect only certain actions but not the entire script. Although lacking experience with online shops, novice users show similar expectations about the general order of actions as experienced users.

Introduction

Over the past few years, the number of online shops has literally exploded, becoming a genuine alternative to shopping at traditional bricks-and-mortar stores for many people. The number of households with access to the Internet is rising and connections are becoming faster and more reliable. Compared to the continuous development of traditional stores from market stands to corner stores to vast supermarkets, acceptance of virtual stores is not just a matter of course. While traditional stores have decades or even centuries of experience with customers and their buying behavior, online stores cannot rely on that kind of intrinsic knowledge. Yet knowing how customers shop online, what they expect from an online store, and how they interact with it is vital for efficient design, advertising, and delivery. The foundation for such knowledge can be based on traditional buying behavior research but needs to be adapted and modified for this new technology.

Then again, consumers have years or decades of experience with small corner stores, supermarkets, and huge department stores. They "know their way around" thus making shopping an efficient, maybe even pleasant, experience. Unlike traditional stores, online shops have no tangible products, no shelves, no aisles, and no human agent for answering questions or helping with finding the desired product. Online shops require that customers adapt their purchase behavior to these restrictions. Nonetheless, online retailers need to know about the strategies customers developed interacting with online shops. Planning an online store efficiently means to make sure these strategies are successful.

The Internet provides an interesting medium for seller-consumer interaction. On one hand, the Internet has almost global availability. Business is not limited to the close neighborhood. To be successful in a worldwide business, the design of an online shop needs to be independent of cultural habits (or should consider relevant cultural differences, see Park & Jun, 2003). On the other hand, the Internet offers a potential for individualization not

possible with traditional stores. Consumers find new ways of comparing products and prices. Individual preferences for methods of payment and shipping can be selected. The number of shops within reach of the individual increases dramatically; consumers are no longer bound to what is available around the next corner.

In this paper, we look at the online shopping procedure from a customer's point of view. We employ a script theoretical approach to describe the course of actions and events consumers expect when they shop on the Internet. In the course of three surveys, we focus on elicitation of a universal online shopping script, its individual derivations, and the interaction of both. We discuss how the search for a universal online shopping script can be based on individual scripts which reflect a high degree of personal preferences and draw implications for both practitioners and further research.

Theoretical Background

Schemata and Scripts

Cognitive Psychology uses the term *schema* to describe hypothetical mental constructs that control attention and enable one to recognize things or events that have been seen before (Bartlett, 1932 for a first reference, see also Abelson, 1981). Due to repetitive interaction with similar things and events, the original experience is constantly transformed and contains abstractions derived from experience with environmental similarity and regularity (Bartlett, 1932; Mandler, 1982; Rumelhart & Ortony, 1977). Schank and Abelson (1977) applied the concept of schemata to describe the representation of complex event sequences in memory. The term script is used to label the representation of such events. Scripts consist of a sequence of actions that are causally and temporally ordered. Standard roles and objects associated with the scripted event are also included (Bower, Black, & Turner, 1979; Schank & Abelson, 1977). When activated in a specific situation, scripts provide behavioral guidance (Searleman & Herrmann, 1994; Stoltman, Tapp, & Lapidus, 1989; Weisberg, 1980). The script

information enables the understanding of what is observed and allows planning and executing conventional activities indicated for this situation. Since scripts are developed individually, the description of the same event may vary significantly between persons. However, the experience is shaped through interaction with the environment which has common characteristics for most people with the same cultural background.

Early on, researchers in the field of consumer behavior made use of script theory to describe customer's buying behavior (e.g., Erasmus, Boshoff, & Rousseau, 2002; Leigh & Rethans, 1983; John & Whitney, 1982; Whitney & John, 1983). With experience, consumers develop scripts for often executed tasks associated with shopping such as searching for a desired product, gathering information necessary to making a decision, and completing the purchase (Leigh & Rethans, 1984). In shopping as well as in any other scripted situation, scripts are perceived as serving two purposes. Firstly, scripts take part in encoding and representation functions. They take over the information processing when an individual is confronted with a certain stimulus environment (e.g., an online store). All informational elements present in the situation are organized in a way that reflects the structure of the script. Secondly, a script enables a set of inferences that evoke expectations about actors, actions, and events in the given situation (Abelson, 1981). Such expectations consecutively have an effect on behavior and goal-oriented judgment (see Bower, Black, & Turner, 1979; den Uyl & van Oostendrop, 1980; Gibbs & Tenney, 1980; Nottenberg & Shoben, 1980).

Measuring Scripts

Traditional studies on scripts are based on script-generation and ratings of typicality (e.g., Galambos & Rips, 1982; Schank & Abelson, 1977; Vaterrodt, 1992). A number of individual scripts are collected in order to ascertain common elements. The goal is to find a generalized or universal script that best describes the behavior of most people. Events with strong cultural standards may have only few derivations between individuals while in other

areas, differences in individual behavioral patterns can be quite substantial. In addition, group specific divergence in behavior can be found. For example, Bellmund, Schmidt, and Wolff-Kreutzmann (as cited in Vaterrodt, 1992) reported gender differences in order and typicality of actions for the script "in the morning" ("am Morgen"). They found the action "put makeup on" ("sich schminken") to be more likely generated by women. Similarly, different online shopping scripts for novices and experienced shoppers may be expected. These differences need to be distinguished from individual preferences.

Scripts in Usability Research

Estimating the usability or usefulness of an online shop is usually done in one of two ways. First, flourishing online businesses can be compared to less successful ones (e.g., Schaffer & Sorflaten, 1998; Selz & Schubert, 1998). General rules for creating useable online stores are concluded from differences in design, goods supplied, and advertisement. Second, by observing customers' interactions with online shops, flaws in the design can be found. In this type of analysis, the experience of the customers under observation is an important factor. Novices and experienced users respond differently to low usability (Schaffer & Sorflaten, 1998) and especially, inexperienced participants have difficulties using an unfamiliar system (Whiteley, 1999).

Although no universal standards exist for designing online shops, various informal rules and guidelines can be found. Such guidelines include aesthetic suggestions, along with suggestions on the readability and navigation of the website (Nielsen, 2000) or describe obvious flaws in common design approaches (Greenwood, 2001). Some are based on personal experience, others on marketing research. Huarng and Christopher (2003) developed criteria for the evaluation of online shops based on the process of a customer's decision to buy. With this approach, the extent to which an online shop meets the customer's needs prior to, during, and after their purchase can be evaluated. A script approach to usability follows a similar

intention. Not the potential customer's needs but rather her expectations of the purchase process itself are used as criteria for the evaluation of online shops.

An individual online shopping script is developed over several interactions with one or more online stores. In the course of many online purchases, individuals learn a routine that is successful in the shops they have visited. In shaping such scripts, the leading online business plays an important role since many online shoppers are among their customers (see Bucher & Jäckel, 2002). As a result, the majority of online customers is familiar with the process employed in these shops. In addition, it is easier for the leading competitor to attract new customers as they appear to be more trustworthy simply due to their large number of customers. Considering the great influence of leading online shops on customer expectations about the purchase process, other online businesses may not be well advised to create stores with a different design since that might prevent customers from making use of their accustomed online shopping script. Conversely, first time customers might have expectations about the purchase process in an online store that is not fulfilled by the leading online store. In addition, the interaction of the individualization and generalization of personal buying behavior is important. In a generalized form, an individual script can be adapted to a variety of shops while a rigid individual preference will limit the choice to just a few shops that are designed in accordance with the individual's expectations. A high degree of individualization would be evident in a high variance in scripts between subjects. In contrast, high accordance in individual scripts would represent generalization. Considering experience as a moderating factor, the degree of individualization could either increase or decrease with the number of visits to online stores. Under the condition that customers chose their preferred online shop early and visited no other shops, they probably developed a script very specific for this one shop. Consequently, the degree of individualization would be high provided that subjects used different shops that do not follow the same (maybe universal) script approach. In addition, a high degree of individualization can be found where shops provide a range of alternative

methods for acquiring the same goal (e.g., product search: browsing categories or using search box). Individuals would eventually find a successful method, while maybe not even being aware that alternative methods exist. In this case, inexperienced users would demonstrate less individual derivations than experienced shoppers. A decrease of individualization with experience could be observed when customers interact with a variety of different online stores. A generalization would result from experience with common elements and procedures. Customers will eventually learn the abstract rules that apply to all shops on the Internet. A universal script that fits all instances could be observed with experienced online shoppers. Only inexperienced users would show derivations from the universal script. There is, of course, a third option remaining in which both groups show an equal level of individual derivations.

For the remainder of this paper, we will illustrate some findings from three surveys designed to elicit online shopping scripts. We will try to shed some light on the interaction of the individual data elicited and the universal script derived from that data. Then we will discuss the implications of our findings for the design of online stores.

Survey 1: Individual Online Shopping Scripts (Expert Interviews)

The first objective of Survey 1 was to identify the components of a hypothetical online shopping script. The free elicitation technique (see Bower, Black, & Turner, 1979) was used for finding actions relevant to online shopping. To participate in this survey, shoppers were required to have at least two years of online shopping experience with repeated online purchases.

Procedure

Eight participants were interviewed about their experience with online shops. Preceding the interview they were informed of the purpose of the study. The script concept was introduced by explaining the restaurant script illustration from Bower, Black, and Turner

(1979). Then, a script-relevant situation was described to activate the proper script (e.g., buying a book at an online book store). The participants were asked to name a list of activities and events which would take place in the given situation. They were also asked to arrange the activities into the appropriate order. Each participant was asked to think of a recent online shopping experience and to describe, in as much detail as possible, the process of buying goods online. If they had experience with several shops, they were asked to name common and distinctive components. Each interview was audio-taped for later transcription. The interviewer took notes and asked questions for clarity where necessary. Each session took about 45-60 minutes.

Sample

Participants in this survey were eight experienced (stating several years of personal experience) online shoppers who buy products online on a regular basis. Each participant described at least one shop. Most had experience with several online stores but usually preferred one of them. Beyond their preferred shop, some participants additionally described a second one they had used rarely or just once. These descriptions were regarded as nonexpert scripts. Altogether, eight expert and three nonexpert scripts were recorded.

Analysis and Results

The interviews with the experienced shoppers made obvious that the process of buying goods online is a complex structure composed of standard actions, decisions, optional steps, and alternative routes (see Fig. 1). Some aspects varied between different shops. Although alternative routes were possible, the interviewees also showed individual preferences for one way but were aware that other ways existed as well. In general, the more experience with one particular shop, the more detailed the description. Shops that were visited only once or long ago were described in a linear fashion while the description of well-known shops was more elaborate (see Fig. 2). In comparison, most scripts had not only common elements but also

strong individual deviations. There was high agreement among the interviewed shoppers regarding several aspects of online-shopping.

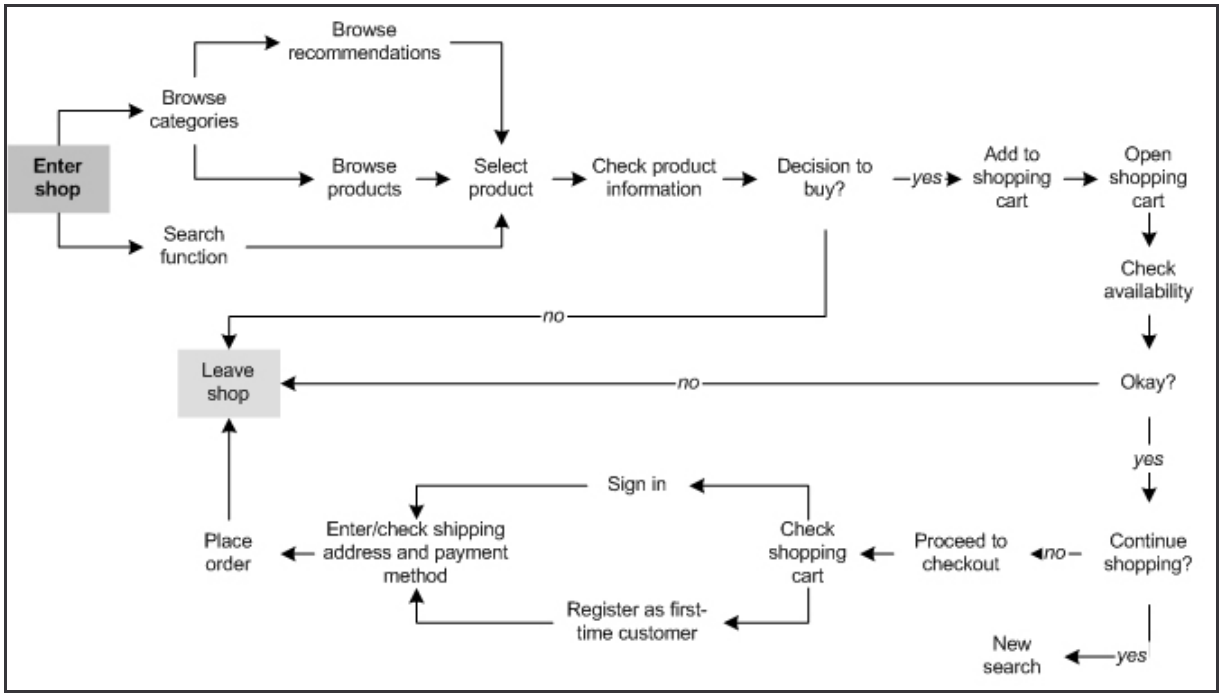

Figure 1: Example of a complex online shopping script

Figure 2: Example of a simple online shopping script

Two independent researchers analyzed the transcripts and composed a list of actions, tasks, decisions, and feedback. Both lists were compared. Decisions (e.g., the answer to the question "do I really want this book?") were considered to be outside of the habitual procedure and were not included in the list of script actions. Tasks were broken down into single actions leading to task completion. Comments on feedback from the shop were rephrased as "checking" or "looking for feedback". Similar activities were grouped together (e.g., "check-out", "go to cashier"). In this way, 28 distinct activities were found; of these, 17 are common (mentioned at least four times, i.e., in more than 33% of the individual scripts), 6 are uncommon (mentioned only two or three times), and 5 are unique (mentioned only once). All of these activities were used as material in the second survey.

Discussion

Altogether, the insights we have gained about online shopping in this survey are encouraging; it appears necessary to pursue further script based research in this field. Despite the complexity and possibility for individual preferences that come with the hypertext structure on the Internet, there seems to be some consensus on how to shop online. On the other hand, more than one third of the actions were mentioned by less than one third of the interviewees, and some participants referred to actions they knew existed but had never used before. Thus, more data is required. The actions reported by the participants in this study were used to develop questionnaires for ratings of position and typicality and is addressed in the second study.

Survey 2: Universal Online Shopping Script (Position and Typicality)

The second survey was designed to validate the scripts described in the interviews. A larger population with different levels of expertise in online shopping was asked to estimate typicality and position of given script actions (see Galambos & Rips, 1982). While position ratings characterize the serial order of the script actions, typicality captures the significance of each action within the script. Both ratings were examined using a questionnaire.

Material

Four different types of online stores were used in this study to represent different products and services sold on the internet (books/CDs/DVDs, computer hardware, online hotel reservations, and online ticket services). A pool of items was collected representing actions and events that might be part of various shopping experiences. This pool was created in two steps. For potential actions associated with each of the four online stores, at least two exemplars of corresponding shops were visited, and the list of actions found in the interviews

was checked for plausibility. Care was taken that identical steps were phrased in the same way (e.g., “search for specific book” and “search for specific ticket”). Two lists of actions for each shop were created by randomly shuffling the items.

Procedure

Position and typicality data were collected using a questionnaire. At first, participants rated their experience with online shops (individual rating for CD/books, computer hardware, hotel room reservation, and ticket purchase). Each subject rated either typicality or position (randomly assigned). Each list was introduced by a brief instruction asking the subjects to imagine they were buying the specified product. All ratings had to be done according to their experience or (in absence of experience) their imagination, respectively. Typicality was rated for each action on a six-point scale (anchored from “very atypical/very unlikely” to “very typical/very likely”). For the ratings of sequential order, subjects were asked to go through the list of actions and identify the first action (according to their experience or imagination). Once identified, this action had to be labeled with “1”. Then the subjects had to look through the remaining actions and identify the next action in order. This action had to be labeled with “2”. That way, participants rated the order of all actions that compose the respective script. The participants were allowed to skip and ignore actions they usually would not take.

Sample

Forty-eight psychology undergraduate students participated in this study. All of them were given four lists of actions and were required to rate either typicality or position. That way, 24 ratings of position and 24 ratings of typicality were acquired for each of the four shops.

Analysis and Results

Position ratings correlate with typicality. Actions that had few position ratings also had lower typicality ratings (the correlations are between r =.70 and .86). The analysis of the

position ratings had to take into account the imbalanced number of rated actions. Some individual scripts included as little as nine actions while other participants rated all given actions – although some were supposed to describe alternative routes (e.g., "browsing through categories" and "using search function"). In addition, the number of ratings varied notably. Uncommon actions had fewer ratings than typical ones. Therefore, serial position was transformed to a percentage value corresponding to the location of each action within the script. This modified data was used to calculate an average script. In addition, a cluster analysis was computed for the position ratings of each script. Solutions with 2 to 6 clusters were calculated. The solution with the least variance within all clusters compared to the total variance was selected. Actions within a cluster are closely related to another. Although their actual order may vary notably between individuals, they are likely to be performed jointly. In the script context, they appear as scenes composed of actions that may lead to intermediate goals within the entire script (Schank & Abelson, 1977). For each script used in this study, a cluster solution with 2 to 4 clusters was found. The actions that compose these clusters can indeed be interpreted as script scenes and can be labeled according to the enclosed actions.

Table 1 illustrates the script "buying a book online" with three scenes. The first scene can be labeled "search for product" and comprises all actions from opening the shop to putting the product into the basket. This also includes actions necessary for finding the product and deciding which product to choose. The second scene is labeled "prepare order" and contains actions like "enter personal information" and "check price". The purchase transaction is not completed in the second scene; customers are still able to cancel the order at any time. In the third scene, "submit order", the order is finally submitted and some sort of feedback is expected by the customer.

Buying a book online	Position		Typicality
	Average	Number of Ratings	Average
scene 1: search for product			
enter shop	5.13	22	4.46
select category „books“	14.29	15	3.92
enter search string into search box	16.23	20	4.46
select categories for search	19.23	7	2.88
select genre	20.00	9	2.83
start search	20.83	19	4.33
select book from search results	26.32	21	4.38
read more information on book	31.86	20	3.67
check availability	37.98	18	3.79
open shopping cart	41.67	14	3.79
put book into shopping cart	42.31	21	4.29
scene 2: prepare order			
check shopping cart	52.38	19	4.29
check-out	52.78	22	4.42
check price	53.57	19	4.63
sign-in	53.71	14	3.46
accept secure connection	59.82	10	4.17
select gift-wrapping	64.29	5	1.04
select method of payment	66.67	19	4.33
select method of shipment	66.67	17	2.92
enter delivery address	69.23	19	4.25
check delivery costs	71.43	16	4.13
accept conditions of use	76.14	16	3.88
scene 3: submit order			
enter personal information	61.11	15	3.63
read conditions of use	65.83	10	1.42
check order	85.00	17	4.58
send order	90.91	23	4.54
receive confirmation e-mail	96.43	21	4.17
leave shop	100.00	20	4.21

Notes: Average position is given in percentage of the respective script length. Maximum possible number of position ratings is 24. Typicality varies from 0 (*very atypical*) to 5 (*very typical*).

Table 1: The script “buying a book” online with 3 Scenes

A similar structure can be found for all average scripts. Single script actions can be grouped together in scenes, a finding which supports the idea of using script theory to describe online shopping. Still, the differences in script length make decisions about the actual order of actions difficult. This issue is addressed in the experiment described in the next section.

Discussion

Despite the complexity of the medium, online shopping can be characterized in a script-like structure. There is some consensus about the order of actions; only a few actions show greater flexibility in their position ratings. Despite the differences in the order of actions, individuals group together certain actions that lead to partial goals. These actions are distinct from the rest of the script actions and can be labeled with meaningful scene headers. The average online shopping experience varied extremely between the four online shops. Participants had the most experience with online bookstores and the least with computer hardware shops. A correlation between experience and the number of actions included in the respective script is low. The range of these correlations is between r =.34 for the bookstore script and r = -.15 for the computer hardware script. If there is a difference in individual scripts between experienced and inexperienced online shoppers, it is not revealed through actual script length in a position rating task. There is, nevertheless, some indication that both groups show deviations on a different level. Examining the quality of the reported order of actions made clear that several inexperienced participants were not able to bring the actions into an order that would lead to a successful purchase (e.g., the order is submitted before products are placed into the basket).

Particularly the uncommon actions had a large variation in position between the few subjects who rated them. The calculation used in this study to compensate for differences in script length guarantees that the first and the last action have the same distance in all scripts.

However, since the shortest individual script includes only nine actions while several individuals rated all given actions and, consequently, had scripts with more than 30 actions, two very common actions that are closely related would have a distance to each other that appears up to three times larger in shorter scripts. Both issues are addressed in the third survey.

Survey 3: Script analysis with Pathfinder Networks

Average script rankings disregard the complex structure of the online shopping process discovered in most of the interviews conducted in the first survey. Cluster analysis only reveals information about the relatedness of actions regardless of their position within the script. In this third survey, position ratings were used for measuring distance between pairs of actions. The data is analyzed with the Pathfinder method described in detail by Dearholt and Schvanefeldt (1990). Basically, this method generates networks, so-called PFNETs, which are calculated on the basis of ratings on similarity or distance between pairs of elements – in this case, distance between two actions within the online shopping script. Each action is represented by a node in the PFNET. Nodes are connected directly by arcs and indirectly by edges. Every connection has a weight representing the distance between the two connected entities. The Pathfinder method searches for a solution with a minimum of links between any two points in which all remaining connections are in a monotone relation to the original measurement. The Pathfinder procedure reduces the number of direct connections (arcs) between two nodes if a shorter (less weighted) connection through a predefined number of edges can be found that connects both nodes. Pathfinder requires a similarity matrix as input. In addition, two parameters have to be specified in advance. The Minkowski parameter r is used when calculating the distance between nodes along edges and varies from 1 to infinite. The q parameter limits the number of intermitting nodes considered for indirect connections (varies from 1 to number of nodes minus 1). The result of this procedure is either

a directed or an undirected graph which connects only closely associated nodes in the network. When based on the average distance between individual actions, such a graph describes the flow of the script in a way not possible to detect with cluster analysis and position ratings alone (Dearholt & Schvanefeldt, 1990).

Material

The script "buying a book/CD online" employed in the second survey was used as the basis for a universal online shopping script including 16 actions. Uncommon elements were eliminated from the original script. In addition, actions supposed to describe alternative routes (e.g., search function vs. browsing categories) were reduced to one (in this case: browsing categories). All actions were rephrased so that they would apply to any product. They were also checked for plausibility by looking at several online shops with a large variety of products (namely amazon.de, quelle.de, tschibo.de, and karstadt.de).

Procedure

Participants were asked to rate their online shopping experience. Those who had never used an online shop were labeled "novices". Participants with more than five completed online shop transactions were called "experienced shoppers". All subjects that had at least some experience with online shops but less than five completed transactions were counted as "intermediate".

A card sorting technique was used. Each action was printed on a small card. Cards were shuffled randomly for each participant. The first and the last action ("entering shop" and "leaving shop") were in a fixed position. Subjects were asked to bring the remaining 14 cards into such an order that the position of the actions would best reflect their experience with (or imagination of) online shopping. After sorting the cards, participants wrote down the position of each step on a prepared sheet. With this method, all individual scripts were exactly the same length. All subjects completed the entire procedure within about 10 minutes.

Sample

One hundred and thirteen participants completed the card sorting task. Of these, 29 were experienced online shoppers, 46 had no experience with online shops, and 38 were intermediate users. The participants were mainly students of psychology (75.2%) with an average age of 22.15 years. Ninety-two (81.5%) were female. It is interesting to note that in the experienced group, the percentage of males (31%) with college majors other than psychology (38%) was greater than average. This group was also older (23.28 years).

Analysis and Results

The distance between two actions was determined in each individual script by calculating the absolute value of the difference in position ratings. The distance between direct neighbors is 1. The resulting matrix of all distances is symmetric and suitable for an undirected Pathfinder algorithm. Average distances for all participants and the three experience levels were calculated. The resulting four matrices were used as input for the Pathfinder algorithm. The Minkowski parameter r varied in steps from 1 to 20 (further increase in r did not reduce the number of connections in the PFNET). The parameter q was always set to 15 (amount of actions minus 1).

Average online shopping script. Regardless of the level of experience there is much consensus on the order of the actions at the beginning and at the end of the online shopping procedure. The first steps after entering the shop are “select category”, “read product information”, “view larger product picture”, “select product”, and “put product into basket”. Similarly, prior to “leaving the shop” all groups “select method for payment” and “submit order”. There is little difference between groups in the average script position (see Table 2).

	Level of Experience					
	Novices		Intermediates		Experienced	
	average position	variance	average position	variance	average position	variance
Enter shop	1.00	0.00	1.00	0.00	1.00	0.00
Select product category	2.72	3.10	2.37	0.62	2.41	0.97
Request larger image	4.35	2.14	4.24	1.10	4.28	1.21
Read product description	4.74	1.75	4.66	1.37	4.21	1.03
Select product	4.80	3.36	4.61	2.73	4.41	2.54
Add to shopping cart	7.09	0.97	7.18	1.67	7.03	1.03
Check availability	7.89	5.79	7.37	4.78	7.14	3.91
Sign-in	9.04	15.24	8.03	12.35	9.48	7.90
Check shopping cart	8.70	2.79	9.53	5.61	9.07	4.78
Read and confirm conditions of use	9.04	15.78	10.13	11.79	9.38	11.24
Proceed to check out	11.48	9.37	11.50	6.91	10.59	8.39
Enter shipping address	11.65	5.79	11.34	5.26	12.03	1.89
Select shipping conditions	11.24	3.21	11.76	3.00	12.24	1.19
Select payment method	12.02	3.27	11.95	2.21	12.52	2.40
Place order	14.24	3.47	14.34	3.37	14.21	5.24
Leave shop	16.00	0.00	16.00	0.00	16.00	0.00

Note. Lines between groups of actions mark scene-edges

Table 2: Average script position according to user's level of experience

Pathfinder analysis. The analysis with Pathfinder clearly shows the sequential nature of the supposed online shopping script. This is especially true for the group of experienced users (see Fig. 3).

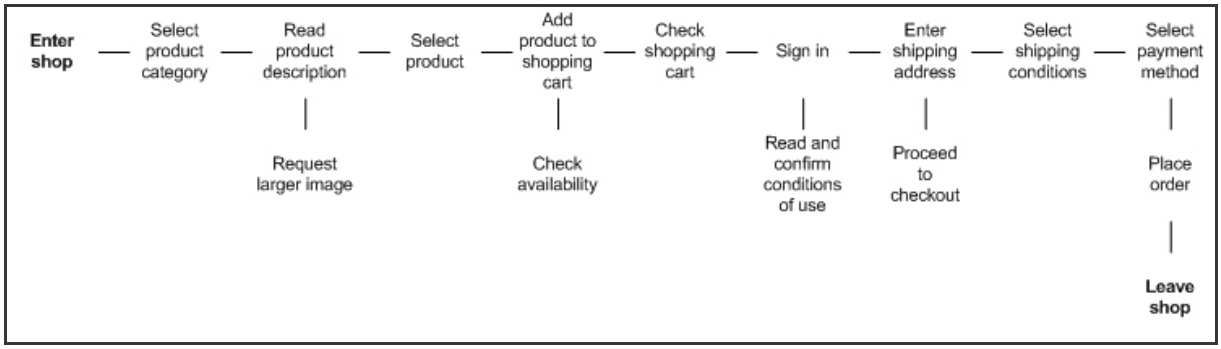

Figure 3: Pathfinder solution for experienced users

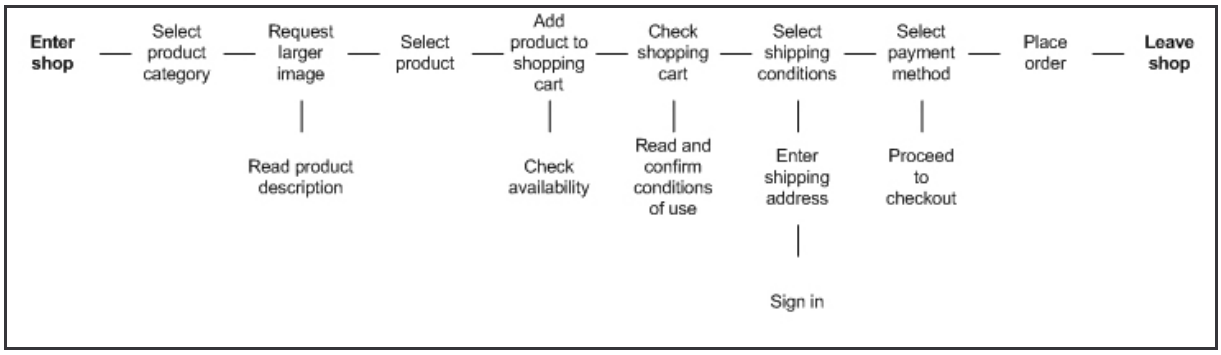

Figure 4: Pathfinder solution for novice users

Most actions have exactly one preceding and one following element. Four actions appear out of the linear order (request larger image, check availability, read and confirm conditions of use, and proceed to checkout). These actions have either a very strong relation to the connected element (such is the case for "request larger image" which has the strongest connection in the entire network to "read product description") or has apparent connection to any element and is attached to the one most closely related ("read and confirm conditions of use").

The pattern is similar in each group. There is no clear effect on the position ratings of single actions between groups except that experienced users show less variance rating the position of the actions "sign in" and "enter shipping address". These actions are required only in online stores but not in traditional stores. Strong relations are found between the actions "proceed to checkout" and "select payment method" for novice users as well but not for experienced users (see Fig. 4). This is typical for shopping in a traditional store where you make your cash or credit card decision early in the checkout procedure. Novices seem to employ their experience with traditional stores as the basis for expectations about the online shopping procedure. Other than that, all groups show considerable agreement. Deviations between groups or individuals occur mainly in the order of actions within the scene "prepare order". This is where actual shops show great variation as well. And it seems that no specific order has any advantage over the others as long as all information required for placing the order is collected.

General Discussion

Proposed as cognitive structures, scripts contain knowledge about generic repetitive events including potential actions, behavior of others, standard objects, as well as entering conditions and expected outcomes. Hence, scripts play an important role in comprehension, inference-making, and behavior in various situations. The studies presented here suggest that the script concept would be useful in describing and explaining online shopping processes as well. With respect to a universal online shopping script, two questions are important: What actions compose the script and in which order do they appear. Due to the novelty, flexibility, and uncertainty of the medium Internet, commonly reliable processes are not yet established. However, the data presented here seems encouraging to further pursue a script approach to describing online shopping behavior. Despite the complexity of the process and individual preferences, the suggested online shopping script is quite linear. While the individual order of single actions varies, there is substantial agreement on the temporal order of groups of actions. These groups can be interpreted as scenes within the proposed online shopping script.

Individual deviations from a universal online shopping script seem to affect just a few actions (e.g., “read and confirm conditions of use”) not the entire script. These actions have no fixed position within the script and may occur at any time during the online shopping procedure. The implication for practitioners would be to make these actions available from anywhere within the online store so that customers can access them anytime they prefer.

In Study 2, some individual scripts were found among inexperienced online shoppers that, if followed, could not lead to a successful purchase. This was not the case in Study 3. Since both studies used different sets of actions that varied especially in the number of actions (around 30 in Study 2 compared to 16 in Study 3), this effect might be based on the difficulty of the task. Further research on the errors and the consequences of flaws in novice scripts are required. It would be interesting to observe first-time online shoppers interacting with actual

online stores. The question is whether the flaws in a previously acquired online shopping script have any effect on their actual behavior during their first visit to an online store. Also, the effect of that interaction to their representation of the online shopping process could lead to some fascinating insights on the role of cognitive representations in online shopping.

Examining the effects of shop designs that are different from the expectations according to a universal online shopping script should lead to more interesting design guidelines. By observing how customers respond to shops with different levels of deviation from the universal script, essential elements can be identified. A local change in the order of actions would probably have only little, if any, effect. Likewise, changes in the arrangement of complete scenes would be impossible since such a design would prevent customers from placing an order successfully. However, if a single action appears out of its regular position by assignation to a different scene, the effect on usability might be quite substantial. For example, some shops require that customers "sign in" (part of scene 2: prepare order) prior to "put product into shopping cart" (part of scene 1: search for product). This is unexpected in the sense that one action appears out of the usual order but more importantly might also raise uncertainty about the actions that will follow as customers have reached the end of their shopping script. Further research is necessary to investigate customer's response to such variations; for instance, which deviations will be accepted by customers and which will reduce usability and user satisfaction.

Designers of online shops need to know about the expectations and needs of potential customers. Script theory can assist in describing online shopping behavior on a very general level that will be suitable for the majority of consumers. In addition, by creating online stores in a specific way, designers provide the environment for online shopping experience and thereby shape the respective script. Experienced shoppers probably rely on a universal shopping script while first-time customers do not have that kind of experience. Nevertheless,

the results of the studies presented here suggest that novices and experienced shoppers have similar expectations and one user interface will meet the requirements of both groups.

Acknowledgements

The research was funded by the Deutsche Forschungsgemeinschaft (DFG) under grant WE 498/35-1. The authors wish to thank several students at the Department of Psychology who assisted in conducting the studies presented here. We also acknowledge the contribution made by two anonymous reviewers on an earlier draft of this article.

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