How Google Triggers the Behavior of its Users

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ABSTRACT

With this contribution we would like to explore if Google's new style guides on their search engine result pages count for a more liberal competition on electronic information markets. To get empirical evidence on this research question a two stage experimental eye tracking study was conducted. On the first stage the attention and selection behavior of 20 participants on 'universal search' engine result pages was recorded and published (Möller & Schierl, 2012). On the second stage 35 participants took part in a follow-up study in 2013 and were confronted with different pages of search results taken from Google's proposal to the European Commission. The results reveal that the implemented visual markers by Google weigh heavily in favour of Google's own services and considering this will have a negative effect on the liberal competition with other providers of online information.

Keywords: search engines, persuasive communication, eye tracking, advertising

1. ON THE PERSUASIVENESS OF SEARCH ENGINE RESULT PAGES

The popular and economic successful internet-based service Google seems to become almighty and untouchable. "In 2012, Google was also ranked first in terms of digital advertising revenue of selected online companies, generating more than 10 times the amount of revenue as second-ranked Yahoo. (…) With the spread of smartphones and other mobile devices, mobile advertising is also undergoing strong growth trends." (Statistica, 2014). But on the other hand Google became discredited. "(…) Döpfner wrote of Google's large, unavoidable role in the online ecosystem, and its threat to the future of online commerce in Europe. He calls on European agencies and institutions to take action to protect their businesses from the threat of Google's behavior." (Fairsearch, May 19, 2014). The promotional communication in the web represents an excellent field of application for different strategies of persuasion that are well-known in communication theory as well as in media psychology. Subliminal perception of advertising seems to affect our cognition, emotions and behavior unopposed (Loftus & Klinger, 1992) and this is why they are illegal in most countries. But even if we can be aware of ads, we don't remember them in everyday life. This is why for example internet ads offer further marketing strategies concerning advertising impacts in research (e.g. Ferreira, et al., 2011; Edelman & Gilchrist, 2012). This can be constituted by the suggestive puissance of the applied advertising media as well as the internal attitude to information processing (Frey, 1998). The latter resorts to the two-process-constructs established in psychology as high and low involvement of social judgment theory (Sherif & Cantril, 1947) and the here from generated Elaboration Likelihood Model by Petty and Cacioppo (1979) and Heuristic Systematic Model (Chaiken, 1980). Pictures, thumbnails or other visual labels used as design elements in advertising have an increasing meaning owing to an information overload in western media societies and therefore they do have a main communication function in print media within the last decades (Meyers-Levy & Malaviya, 1999). The inherent possibility of a fast, descriptive and emotional communication (Knobloch, 2008) of analogue picture codes (Watzlawick, Beavin & Jackson, 1968) can also be considered as an additional benefit in commercial communication. Under tightened competitive conditions pictures achieve a strategic importance for the communication success from the communicator's perspective as well as for the 'return on investment', which is the most important criterion of advertising success (Rust, Lemon & Zeithaml, 2004). It can be deduced that picture-selecting processes have an emphasized role in advertising and promotion in general. If one is able to create designs that attract attention effectually involving affective-emotional or motivational response or intended behavior, providers can gain a decisive competitive advantage by user oriented interfaces especially in markets with a large

variety of offers and little possibility of differentiation. A precondition of this is that relevant information can be obtained for entrepreneurial decisions in this regard.

For this reason a pilot study was conducted (Möller & Schierl, 2012) to measure the distribution of attention and the selection behavior on so called "Universal Search" engine result pages (SERPs). The following research questions were formulated for the first study. RQ1: "Do mini maps absorb viewers' attention?" RQ2: "Does efficiency of search tasks vary with visible versus missing mini maps?" In respect to eye tracking methodology, it is assumed that the user's visual attention is focused on the object that is also the object of the cognitive processing (eye-mind hypothesis, cf. Just and Carpenter, 1980). It is further assumed that the time of fixation corresponds to the time of cognitive processing (immediacy assumption hypothesis, cf. ibid). Due to Google's proposal to the European Commission in 2013 the follow-up study focused on the following RQ3: "Are Google's new graphical hints like the information icon, 'ad reflated to ..' links, rival links and 'sponsored' links' affecting the visual attention of the users?"

2. PRAGMATICS OF HCI

In the 80s Donald Norman established the concept of 'User Experience' (1981) in human-computer interaction. He pointed to a paradox of HCI. If usability has mainly treated HCI for creating mandatory standards, the remunerative video game market caused a revise in opinion (Vorderer & Bryant, 2006). Emotions have a strong relevance for the cognition and evaluation of designs, therefore Donald Norman spoke about 'Emotional Design' (Norman, 2004). Those pragmatic inferences (Morris, 1938, pp. 43-54; Sperber & Wilson, 1997, p.149) by users lead to an expansion in the theoretical understanding from usability to enjoyment (Blythe et al., 2003). Marc Hassenzahl (2003) developed a model of user experience which attaches importance to the designer perspective as well as to user perspective. According to Hassenzahl (2003), the user perspective includes the apparent product character, which are the pragmatic attributes as well as hedonic attributes like stimulation, identification and evocation. That means the judgment about the product is not only based on rational choice, but on product's appeal, its emotional and behavioral consequences during specific usage situations. So the goal of this pilot study was, to get empirical evidence on the pragmatic and hedonic aspects of SERPs and its visual cognition. For this, the above-mentioned research questions were specified by the following hypothesis. With H1 it was assumed that if a mini map is visible, the viewers' attention will be different in the way that the fixation duration will be higher and that the mini map will show the smallest time to first fixation of all 'areas of interest' (AOIs). With H2 it was assumed that an implemented mini map reduces efficiency. Efficiency was measured by time until mouse-click interval and it was assumed that participants need more time for their decision if a SERP with a mini map was presented. The new data of a follow-up study presented in this paper deduces with H3 that Google's new design elements will avoid differences in AOIs of selected SERPs regarding the named eyetracking parameter.

3. METHOD OF THE FIRST STUDY

3.1 Design

The experiment by Möller and Schierl (2012) followed a randomized 2x2 mixed-design. First factor was the condition of the SERP screenshot (with vs. without mini map). Second factor was the respective city (search target: national city Hannover, Germany or the international city Houston, USA). The first group saw the stimuli "Hannover with mini map" + "Houston without mini map" while the second group's stimuli included "Hannover without mini map" + "Houston with mini map".

3.2 Material

Screenshots of Google SERPs were used as stimuli. In order to have identical Google advertisements and SERPs for all subjects, screen shots were produced for the three search terms 'Stadtplan Hannover' [city map Hannover], 'Hannover Stadtplan Innenstadt' [Hannover inner city map] and 'map Houston'.

3.3 Participants

Because it was just a pilot study, only 20 subjects were recruited. All participants were either students or employees at the German Sport University Cologne. In both groups men and women were equally balanced. Participants' mean age was 35.2 years (SD=13.86 years). Educational achievement was high, because only three persons (15 %) did not hold the general baccalaureate. Experiences in computer usage was balanced over conditions, because half of the sample indicated that they utilized computer programs but did not configure them by themselves and that they would consult other persons when having problems using computers. The other 50 percent was rated as experienced computer users, judged by this criterion.

3.4 Measure

In the study we used an observation and a survey with the help of a questionnaire as methods. Items included participants' preferred web browsers, a specific search engine or a specific mapping. Because cognitive processes like the recall bias (Schwarz, 2007) may have an impact on participants' declarations, eye tracking methodology (Duchowski, 2007) was used additionally. The use of this elaborate method was necessary in order to catch spontaneous user behavior that is less biased by willful processes. Oculometrics (Duchowski, 2007) were recorded during the entire measuring section. For the signal denoising, each participant was calibrated (Tobii, 2010) and blinks were marked as (0,0) in raw data. Those gaps in raw data were not interpolated. Stimuli were always centered in the middle of the screen monitor, to minimize decrease of accuracy in peripheral regions (Duchowski, 2007). Video and audio of all participants were recorded with a webcam in parallel and integrated with the stimuli presented and the tracking data into an overall view. Therefore, the test procedure chosen here follows the precondition of constructive behavioral measuring (Hoiem & Sullivan, 1994). This procedure had the advantage that no reduction of data occurred during the acquisition of the raw data. Furthermore, various parameters could be determined from the raw data. For this purpose so-called areas of interest (AOI) were defined. For each AOI, four parameters were computed from the raw data following the Tobii Studio user manual (Tobii, 2010):

(1) Fixation count (number of fixations within an AOI; McCarley et al., 2004),
(2) Absolute duration of the fixations (sum of seconds spent on an AOI,; Karatekin, 2007),
(3) Time to first fixation (the time in seconds from the onset of the stimulus until the first fixation was detected in an AOI; Byrne et al., 1999),
(4) Time until first mouse click (time subject needed to make a decision; Byrne et al., 1999; Möller et al., 2014),

A fixation occurs when an eye movement rests for at least 200 milliseconds on an area of 50 pixels using a display resolution of 1920 by 1080 pixels (Rayner, 1992; Duchowski, 2007).

3.5 Procedure

The subjects were seated on an office chair in front of a 46-inch monitor. The distance participant to monitor was approx. two meters (6.6 ft.). The eye-tracking unit stood about 70 centimeters (= 2.297 ft) away from each subject and therefore was outside the regular sight field. All instructions, stimuli and questions were shown on the screen to avoid distortions caused by the experimenter. In order to get the subjects used to the situation and gain their attention they were informed that they were participating in a perception experiment. First a Stroop test for word recognition was conducted, followed by a geometrical-optical illusion. Then the subjects were asked to look at an advertisement for eight seconds. In the advertisement, an endorser with a visible physical handicap was promoting a fictional automobile brand. Besides the car brand, subjects were questioned about any conspicuous issues concerning the endorser. Then the subjects received written instructions to click on an item they desired in the following screenshot of an online advertisement. The related stimulus page showed a screen shot from eBay with integrated advertising. After subjects indicated their choice with a mouse-click they were confronted with a recognition test in which subjects should indicate any sponsor who was visible on the eBay site. Subjects were then shown a picture of a table tennis athlete in a tuxedo and asked to assign a name to him from a list of choices. The participants were shown a picture of the same athlete performing his sport and were asked for a name choice. This was all not relevant for the research questions but was used to cover the real intention of the experiment. The instruction that followed was: "Imagine you are in Hannover and are looking for the AWD-Arena to watch a soccer game". A search term had to be selected from a prepared list. The next page showed the information: "In the following you will find a search result page one could for example get by searching for the terms like 'Stadtplan Hannover'. Please choose spontaneously anything guiding to the target. A city map of Hannover will be shown to you for ten seconds during which you are to memorize distinctive points." Then the screen shot of the Universal Search SERP 'Hannover with miniaturized Google map' followed. After a click on a random area of the screen shot an excerpt of the city map of Hannover with the area around the AWD-Arena was presented for ten seconds. Thereafter the subjects were asked to choose from a list the option corresponding to a detail in the map section just shown. Then the following instruction was presented: "Imagine you are on vacation in Houston, Texas and want to attend a basketball game in the Toyota Sports Center." Then the question about the preferred search term followed again and the presentation of the screen shot of an ordinary SERP, without the miniaturized Google map. Here again, an area guiding to the target had to be selected by mouse click.

After the click a map detail appeared again, this time from Houston. On this map section the participants had to memorize details, one would be questioned out of a menu of choices. Half of the subjects participated under these conditions. The other, structurally equal half received the complementary content, which is a SERP from Hannover without the miniaturized Google map and that from Houston with miniaturized Google

map in the SERP. After the eye tracking test the 20 subjects stated their preferred web browser, search engine and map service indicated in a list of choices. The preferences within this sampling are clearly visible. It is noteworthy that a kind of market dominance by Google could not be shown for web browsers. This can be explained by the fact that the subjects had to actively remember (recognition) during the questioning, and that this memory could be distorted as opposed to the actual usage. On the other hand, this company has a strong position among search engines and especially among map services.

After participants finished the questionnaire, they got a debriefing and were informed about the real aim of the experiment. The participants were thanked and dismissed.

4. RESULTS OF THE FIRST STUDY

As a first analytical step, the left mouse clicks of the subjects were documented in the four target pictures and heat maps of fixation duration were generated. Figure 1 shows the two SERPs with miniaturized Google maps; these elements generated the major portion of the viewers' total visual attention duration to them (M_{map} = 2.8 s, SD = 2.1; M_{links} = 1.8 s, SD = 1.3), in the sense of a vampire effect (Eisend, 2011). Due to the data a t-test for paired samples of maps vs. links was computed for time to first fixation (TFF).

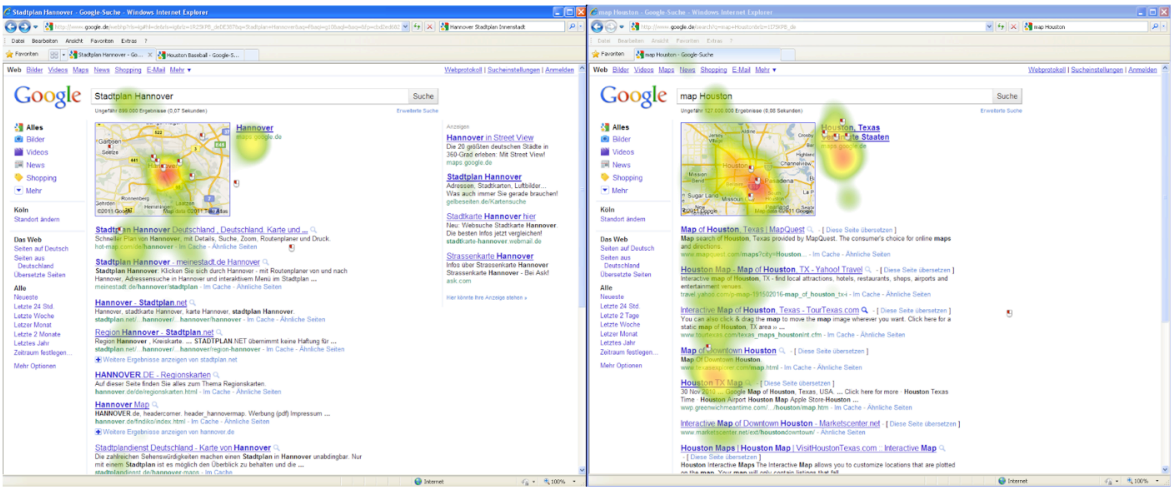

Figure 1. Mouse clicks and fixation duration of the national (left) and international (right) SERP.

Maps evoked a shorter TFF (M=1.3, SD=1.1) as the SERPs without miniaturized map did (M=3.8, SD=2.1). $T_{(17)}$=4.84 was significant ($p<0.001$) with d_Z=1.14 and H1 must be regarded as verified. A remarkable difference exists between the national (left) and the international (right) target, relating to the number of mouse clicks, as shown in the following graphic representation of the click distribution in percentages of the users. For the search word "Hannover" the Universal Search SERP's miniaturized Google Map received eight clicks (80%), twice the number of clicks for the Google map on the SERP for the search word "Houston" (three clicks 33.3%). X^2=5.051, p=.025, Φ=.503. On the last mentioned SERP the Google-Link was chosen the most, with four mouse clicks. This suggests that the selection behavior is actually influenced by the kind of the cognitive representation of the target and should be taken into account in further studies.

This assumption is supported by the two SERPs that have no miniaturized Google Map (fig. 2). The SERP for "Hannover Stadtplan Innenstadt" [Hannover inner city map] shows a total viewing time of 21.1 seconds and with a click amount of 90% of the subjects a distinct focusing on the first link. For the "map Houston" without Google miniaturized map the total viewing time on the first link is also highest with 25.6 s, yet two subjects chose the seventh link. The differences in viewing time were statistically not relevant ($t_{(18)}$=-.91, p>.375). An explanation for this behavior cannot be delivered in the context of a pilot study, but should be further pursued regarding the impact of cognitive representation.

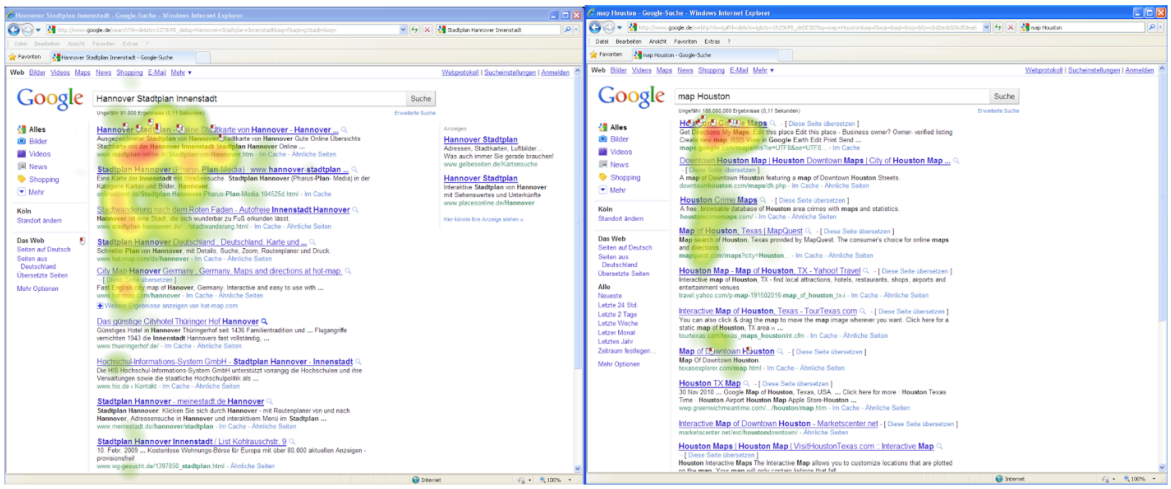

Figure 2. Mouse clicks and fixation duration on SERPs without miniaturized Google map for both target cities.

It is remarkable that the miniaturized Google maps do not contribute to quicker decision-making and clicking behavior but rather make the decision finding less efficient ($M_{with\ map}$=15.07 s, SD=8.56, $M_{without\ map}$=7.26 SD=5.02). T-test for paired samples is significant ($t_{(19)}$=3.82, p<.001, d_Z=.854), so that H2 is verified. On average, ten subjects needed 16.03 seconds up to the click (Houston) or 12.47 seconds up to click "Hannover". With the SERPs without miniaturized Google maps it was only 7.69 s (Houston) or 6.72 s (Hannover). At the same time, the data under complementary conditions once more showed that the length of time on the page and therewith the cognitive load for the national destination (Hannover) is less as opposed to the international destination (Houston). Fig. 2 illustrates the high relevance of the top two links for gaining visual attention. Because the Google advertisements are missing in this listing for lack of fixation on any of them, the eyes of their viewers seem to reveal their ineffectiveness.

If the assumption is correct that the elements in the upper half of the SERPs have a special significance, this should show up in the parameter that indicates the time interval from the beginning of the presentation of the SERP until the first fixation of the defined AOI. The shorter the time interval, the quicker the visual attention of the user is won. For methodical reasons the processing of the data does not start at zero but at 300 milliseconds. This is necessary because the eyes are directed towards the screen before showing the SERP. If this parameter was determined exactly from the moment of showing, there would be a risk that the data would be subjected to a carry-over effect. The 300 milliseconds consider this condition and allow enough time for orientation. Additionally a pre-test was used to determine a value that limits the interval upwards. A random sample of ten additional subjects recruited for this pre-test did not need more than three seconds until the click. If it is interesting how soon the subjects of the pilot study devoted their interest to the various AOI on the four SERPs, the onset of the measurement relates to the moment 0.3 s after showing the respective SERP. All initial fixations later than 3.3 s after stimulus onset were regarded as critical in respect of the potential processing because, on average, after this point in time a decision already had been made. In the following the average values for the time elapsed until the first fixation of the AOI of the four SERPs is listed.

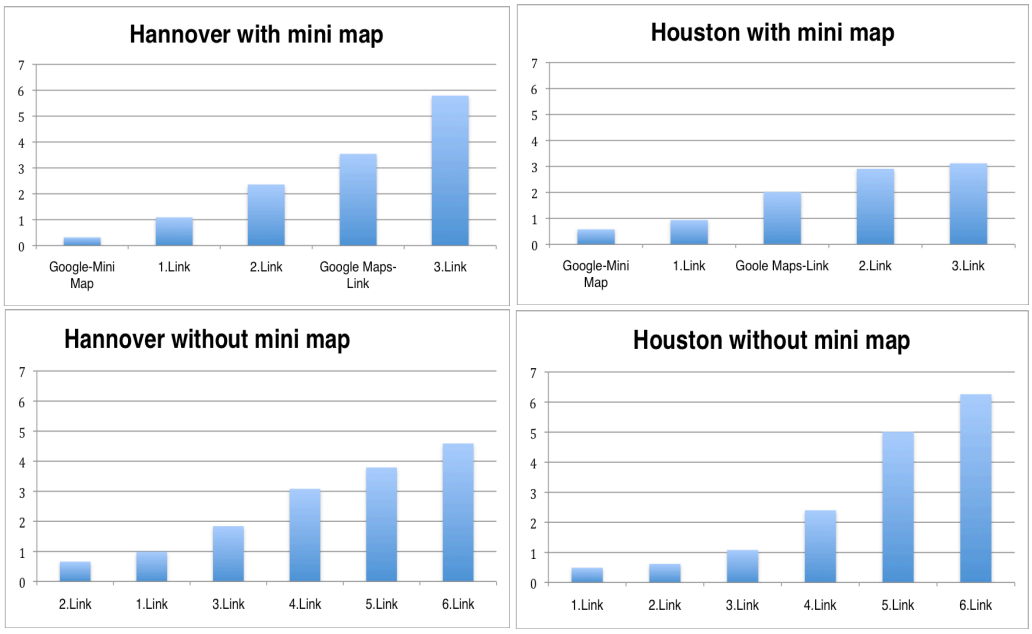

Figure 3. Seconds until first fixation of AOI of the four SERPs.

The distribution of the first fixation of the AOI of the four SERPs clarifies that pictures strongly attract visual attention. For the statistical procedure, the average for TFF data 'Google mini map' and 'Google maps-link' were computed and the average in TFF data for all other links were additionally computed. M_{map}=1.22 s, $M_{other\ links}$=3.39 s were compared by t-test und revealed a statistical significant difference ($t_{(18)}$=-4.387, p<.001, d_Z=1.006). The upper design elements, like the miniaturized Google maps, the first four search result links and in part the Google maps links attract a strong spontaneous attention.

5. THE FOLLOW-UP STUDY

Due to the point that some of Google's competitors intervened and opened a case at the EUROPEAN COMMISSION (COMP/C-3/39.740), Google changed its' style guide for SERPs in 2013. This is why a follow-up eye tracking study was conducted and financed by ICOMP Initiative for a Competitive Online Marketplace.

5.1 Design

Again an eye tracker was used to get quantitative data on the user centered interaction. Because it is just a follow-up process a one-shot design was used.

5.2 Material

The specification was to measure eye movements on search engine result pages given as examples in the October 21, 2013 commitment proposal by Google, Annex V, of the Case COMP/C-3/39.740 (EU Commission, 2013) and an additional SERP depicting Google Maps. For this, the following three SERPs were used as target pictures. The following three figures show additionally the areas of interest (AOI) that were defined for the calculation of the named eye tracking parameters.

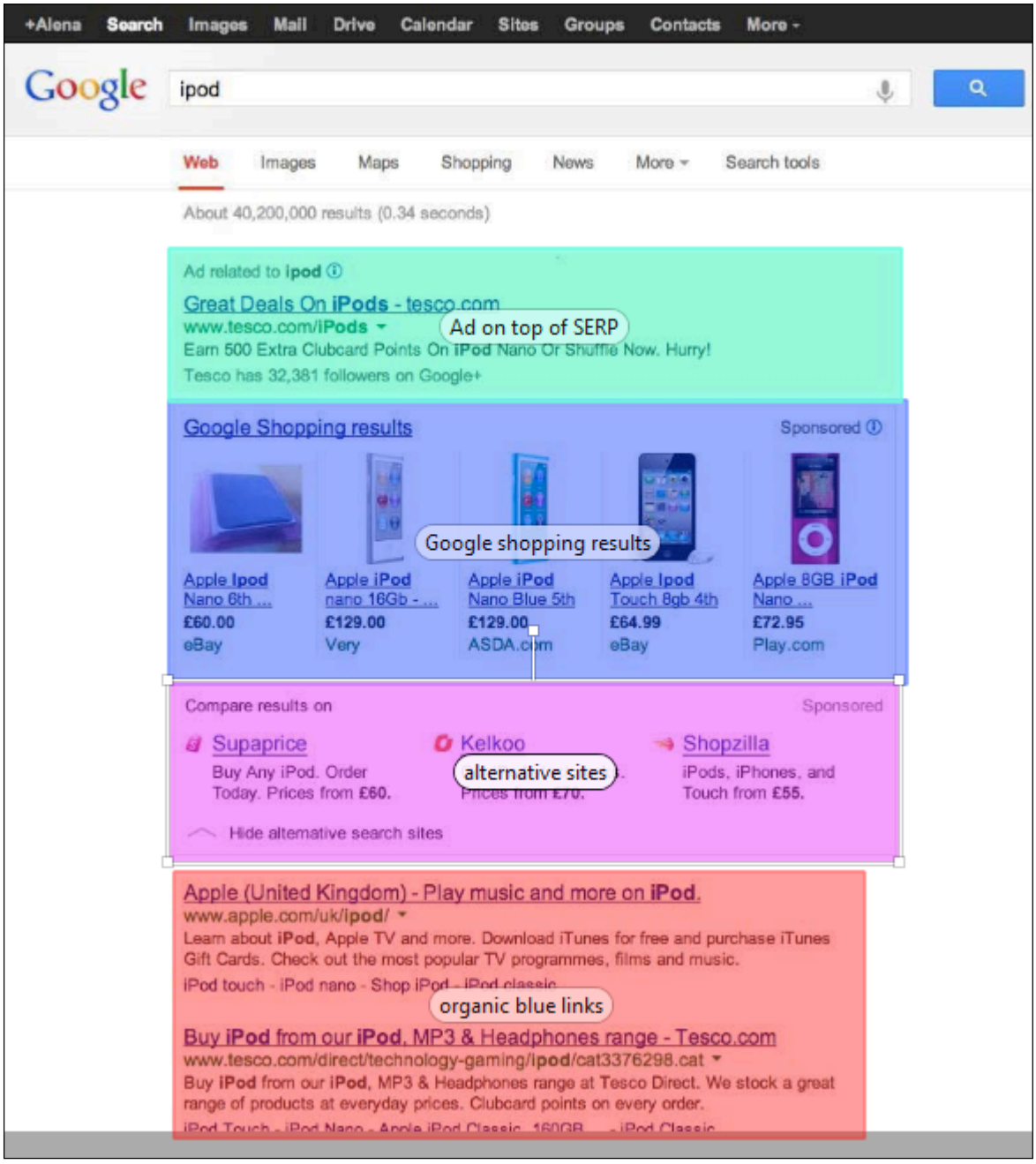

Figure 4. Target picture "iPod shopping" (from EU Commission, 2013, p.35). AOIs are indicated and labeled.

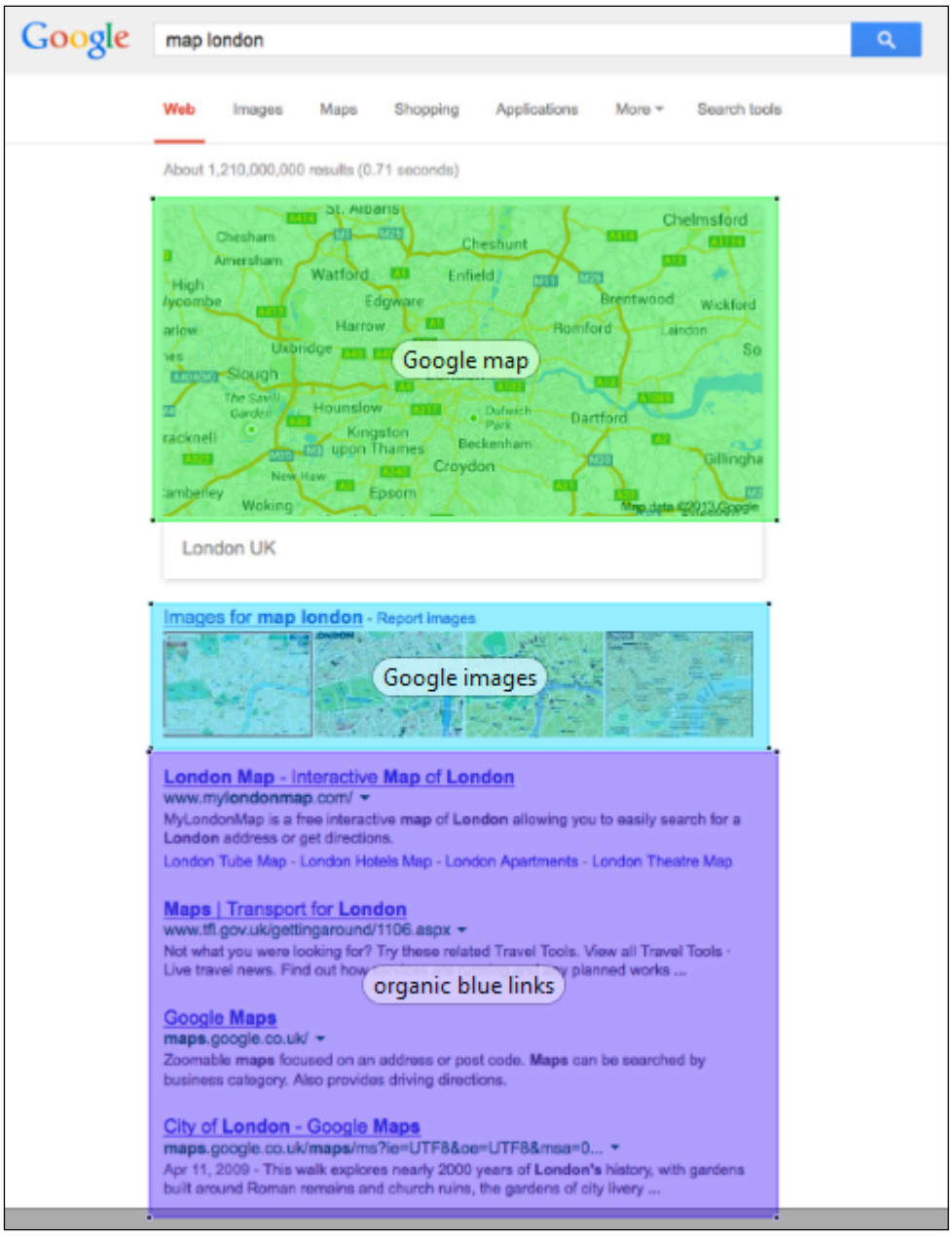

Figure 5. Target picture "map London" (screenshot from actual Google web search engine). AOIs are indicated and labeled

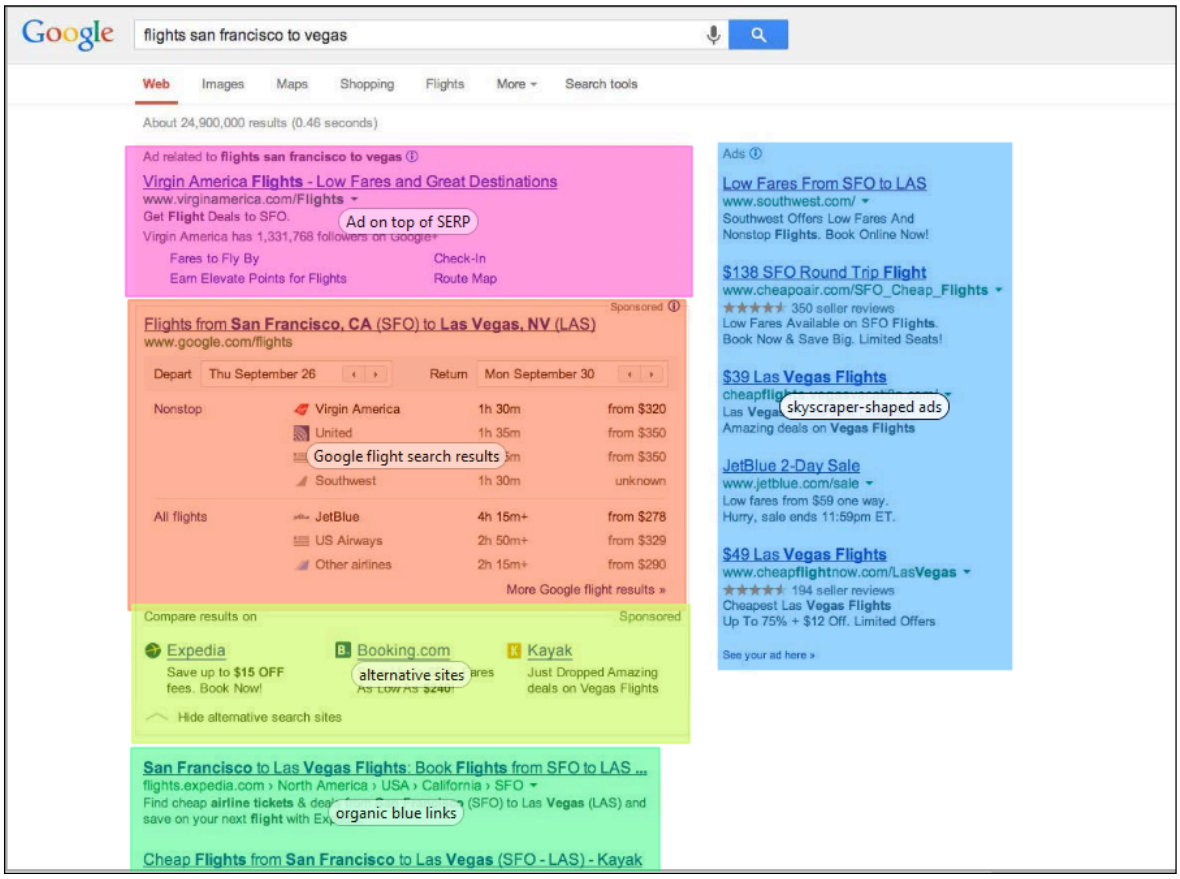

Figure 6. Target picture "flight search" (from EU Commission, 2013, p.39). AOIs are indicated and labeled.

5.3 Participants

Because it was just a pilot study, only 34 subjects were recruited. All participants were either students or employees at the German Sport University Cologne. In both groups men and women were equally balanced. Participants' mean age was 35.2 years (SD=13.86 years). Educational achievement was high, because only three persons (15 %) did not hold the general baccalaureate. Experiences in computer usage was balanced over conditions, because half of the sample indicated that they utilized computer programs but did not configure them by themselves and that they would consult other persons when having problems using computers. The other 50 percent was rated as experienced computer users, judged by this criterion.

5.4 Measure

The measures were again the amount of fixations, the absolute duration of fixations in an AOI and the time to first fixation using the same algorithm to identify a fixation as described in 3.4.

5.5 Procedure

The procedure was equal to the one described in 3.4 with the exception that of cause the target pictures (image thumbnails) were adopted to Google's new style guide. For this, after the subjects rated the table tennis athlete, they were asked if they are iPod users, if they usually buy those electronic devices in specialized shops, discount shops, or online shops. After this subjects were instructed to assume intention to buy an iPod nano and select one of six search queries with a mouse click. The instruction continued and after their choice a Google search result page was visible and subjects could click on it to proceed (cf. fig. 4, taken from EU Commission, 2013, p. 35) by buying an iPod nano. Next instruction was to memorize as many details of an upcoming iPod ad. The ad was visible for six seconds. Then subjects had to answer how many apps were visible on the display of iPod that was presented in the ad. After that subjects were asked to use a SERP to choose a map to find Apple Stores in London (cf. fig.5, screenshot from actual Google web search engine). Then they were asked if they ever booked a flight on the web. An information was then given mentioning that web booking is very usual in the US. The next SERP showed different flight offers. Subjects could choose one of the offers, again by clicking as usual. After this subjects were thanked for their

participation, they got a debriefing and were informed about the real aim of the experiment. The participants were dismissed.

6. RESULTS OF THE FOLLOW-UP

As the first analytical step, the left mouse clicks of the subjects were marked in the three target pictures as symbolized ( ) mouse-left-click.

At the same time these data were to be complemented by the data of the eye movement. Therefore corresponding heat maps were generated. In these heat maps, a color code indicates the diverse intensities of the visual attention triggered by the SERPs. The Heat map color codes consider the color red as the maximal viewing time and the color green the minimal fixation duration. In all areas without color assignment there was no fixation. For optimal comparability, each heat map is shown on a single page followed by a table containing the corresponding data. Next to the following description of eye tracking data, Friedman-Tests were used for statistical differences between the AOIs. Friedman tests are adequate because of the small sample size, the problems with the normal distribution assumption of physiological samples and because groups are paired samples. Levels of significance are indicated in the tables. Differences in the data of the time to first mouse click could not be proofed that way, because the amount of cases was too small. Results will be discussed below.

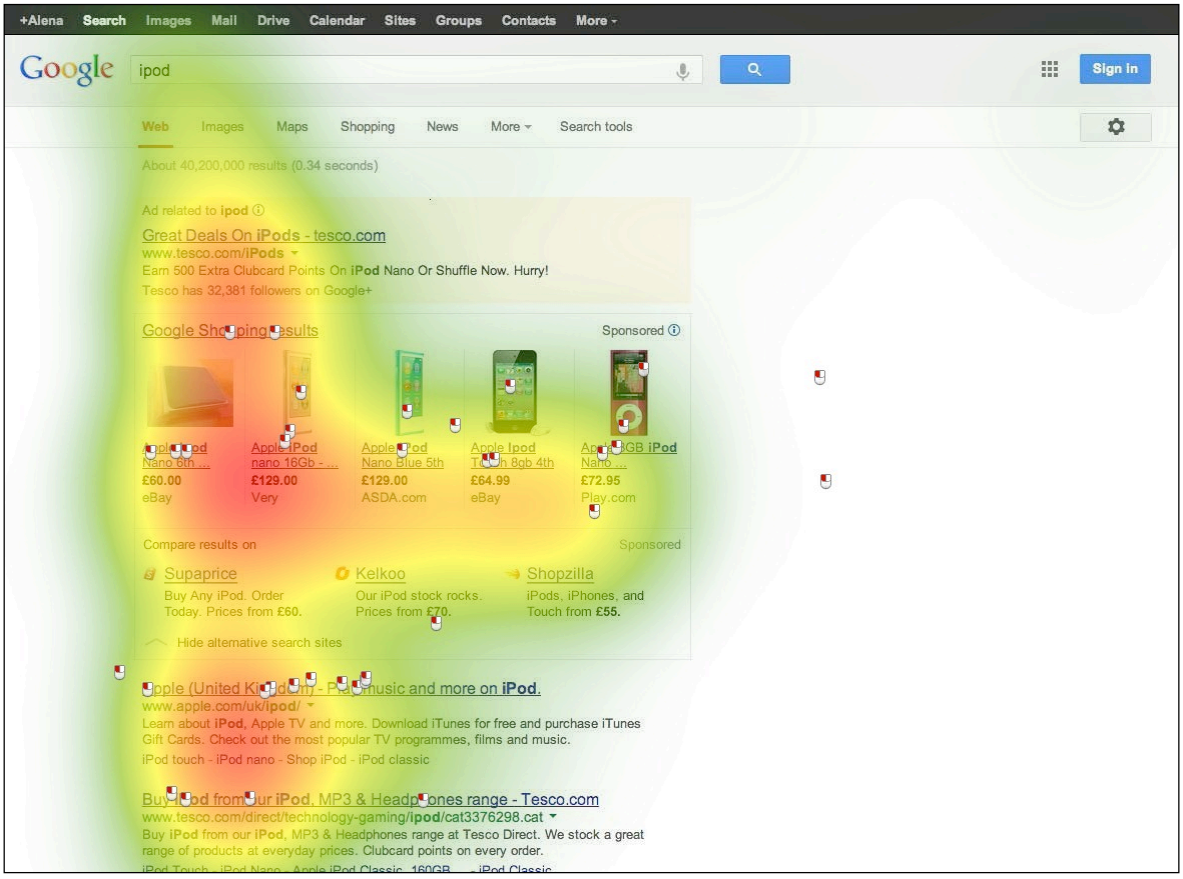

Figure 7. Mouse clicks and total visual attention on target picture "iPod shopping".

Table 1. Overview of the recorded parameters on target picture “iPod shopping” (cf. fig.7). If existing, the corresponding level of significance is indicated.

Area of interest (AOI)	**Fixation duration** (FD) H(35), X^2=61.4 ***	**Time to First Fixation** (TFF) H(35), X^2=59.0 ***	**Fixation Counts** (FC) H(35), X^2=44.0 ***	**Mouse Clicks** (MC)
Ad on top of SERP	0.54	1.08	192	0
Google	1.10	0.27	715	18

Shopping results				
“alternative sites”	0.67	3.11	311	1
Organic blue links	1.60	0.35	459	13

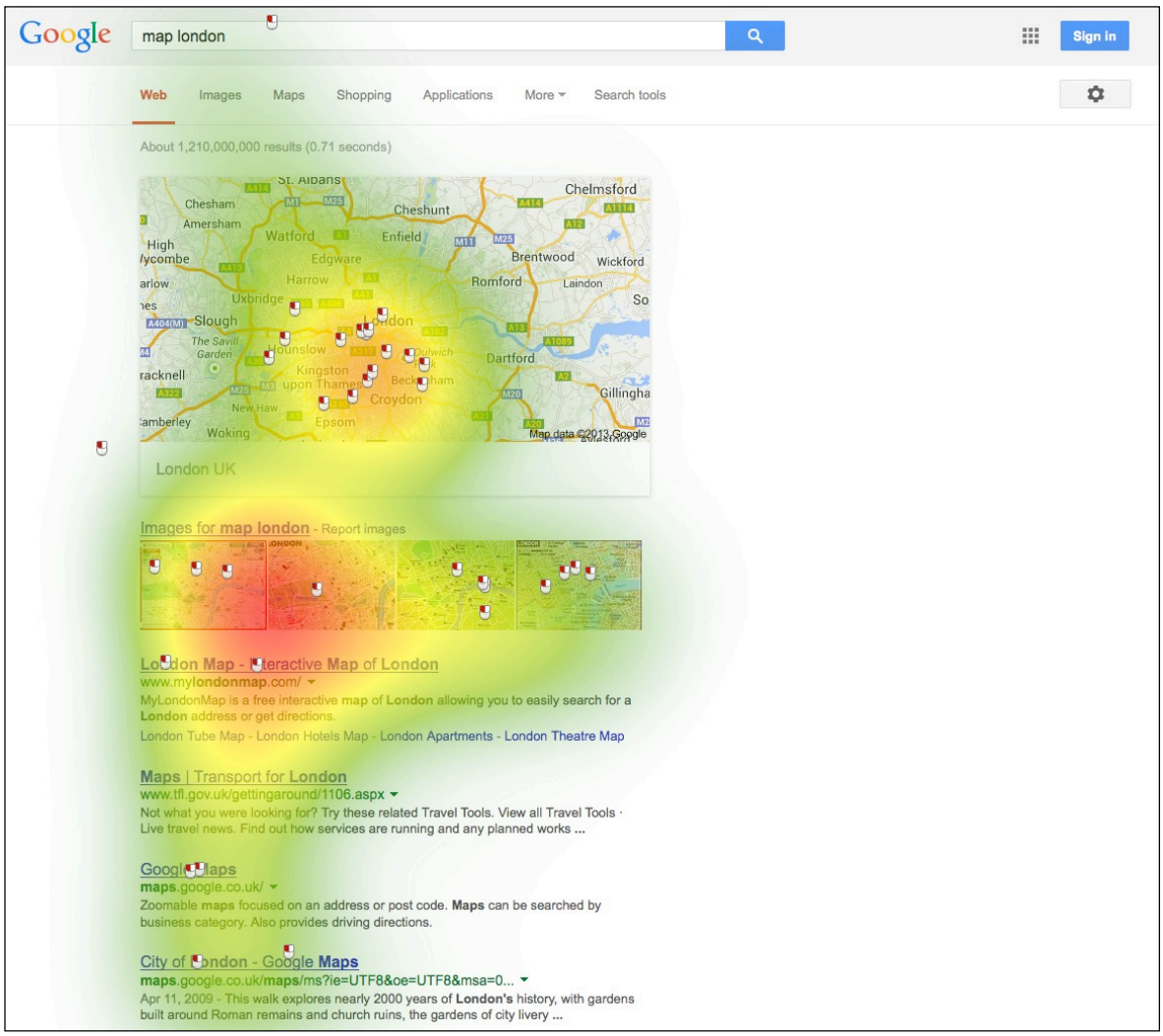

Figure 8. Mouse clicks and total visual attention on the target picture "map London"

Table 2. Overview of the recorded parameters on target picture "map London" (cf. fig.8).

Area of interest (AOI)	**Fixation duration** (FD) H(16), X^2=5.8 ns	**Time to First Fixation** (TFF) H(16), X^2=41.3 ***	**Fixation Counts** (FC) H(16), X^2=20.7 ***	**Mouse Clicks** (MC)
Google Map	0.77	0.46	286	15
Google Images	0.98	0.62	348	12
Organic blue links	1.39	2.87	322	6

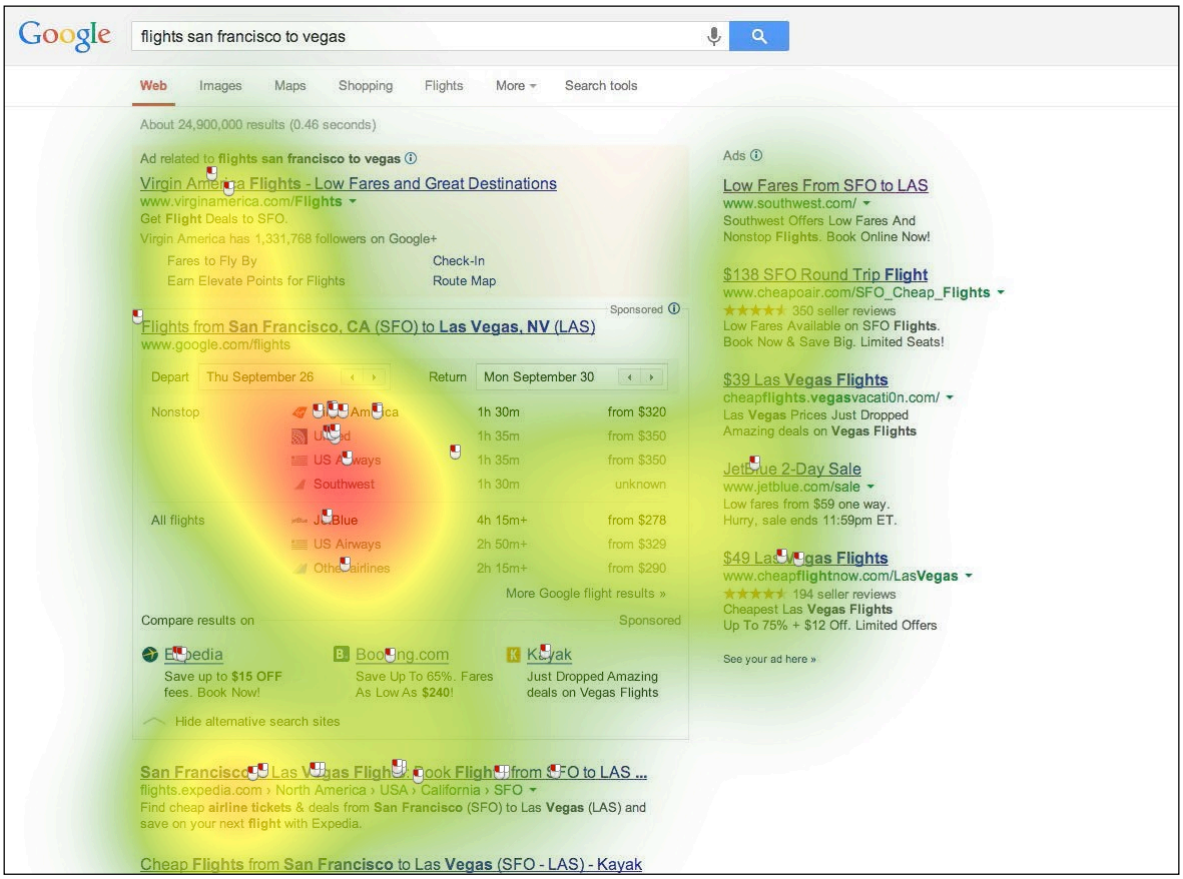

Figure 9. Mouse clicks and total visual attention on the target picture "flight search"

Table 3. Overview of the recorded parameters on target picture "flight search" (cf. fig.9).

Area of interest (AOI)	**Fixation duration** (FD) H(26), X^2=1.5 ns	**Time to First Fixation** (TFF) H(26), X^2=30.7 ***	**Fixation Counts** (FC) H(26), X^2=0.18 ns	**Mouse Clicks** (MC)
Ad on top of SERP	0.85	1.50	143	2
Google flight search results	2.03	0.10	556	15
Alternative sites	0.91	5.54	110	4
Organic blue links	1.16	3.35	196	11
Skyscraper-shaped ads	1.66	3.93	174	3

The SERP for the search term "iPod" reveals that thumbnail product pictures guide the spontaneous visual attention of users to the "Google Shopping Results". For this area the time to first fixation is least: 0.27 seconds. This concurs with the amount of mouse clicks: 56% of the participants clicked into this area with Google's own product search. The average amount of visible attention (the total fixation duration) is 1.1 seconds. The maximum total duration of fixations on the organic links is 1.6 seconds. 41% clicked one of the organic blue links, mostly the first (Apple.com). The related ad at the top of the SERP had no clicks and the

"alternative search sites" were scanned visually even less and only clicked once. Both show a very small time in fixation duration of round about half a second.

On the target SERP "map London" 46% of the participants clicked on the Google map whereas 36% clicked on the area of "Google Images" which refers to another Google service. Also the total duration of fixations for both areas is comparable (0.77 seconds for the Google map, 0.98 seconds for the "Google images"). But the Google map gets visual attention of the user faster (0.49 seconds) compared to the "Google Image" (0.62 seconds). Number one organic link “mylondonmap.com” is a site using the syndicated Google Maps API and received two clicks. The official “Transport for London” maps received no click. Further down the SERP organic links, again referring to Google Maps, received four clicks together.

The "flight search" SERP in fig. 9 is the visually most complex stimulus in the study design. Similar to the SERP "iPod shopping" only few mouse clicks are on the ad on the top of the SERP (two clicks = 6%). Most clicks are on the Google Flight Search "sponsored links" area (43%), followed by the "organic links" area (31%). The "alternative search sites" had little visual attention with correspondingly only four clicks (11%) and the ads on the right side just three clicks (9%). Next to the amount of mouse clicks, the total visual attention (2.03 seconds) as well as the very small time to first fixation (0.10 seconds) indicates that the Google Flight Search area is the most attractive one of this SERP. It is remarkable that even the organic links at the bottom of the Page get more visual attention (1.16 seconds) and faster (3.35 seconds) than the "alternative search sites" (duration 0.91 seconds; time to first fixation = 5.54 seconds). All in all H3 (cf. chapter 2) has to be rejected.

7. CONCLUSIONS

In conclusion, the first study revealed some recommendations for actions of providers of internet-based map services could be pronounced. Empirical evidence suggested that those providers should improve their position on search engine results pages. The map service by Hot Maps will be more noticed and chosen by users, the higher up it is presented on a SERP. Because the first study revealed that the users’ visual attention is massively affected by images (thumbnails included) placed on SERPs, those production design elements seem to be the right way for service providers to get on consumers’ relevant set. As shown above, the users got attended but they did also waste a lot of time during their task. These results were in line with the theoretical assumptions by Norman (1981, 2004), Vorderer and Bryant (2006) and with the theory of ‘amount of invested mental effort’ (Solomon and Leigh, 1984). So, one may say that additional visual information leads to the detriment of efficiency and subsequently also to user’s satisfaction, as long as they operated in a task mode. This kind of self promotion was currently Google's unique advertising proposition and the reason why business rivals made this a lawsuit.

Besides the main effects, the results of both studies showed some additional findings. First, and against the common expectance, the Google advertisements were not noticed by the participants at all and therefore the implementation of Google ads has to be judged as not effective. This side effect will be worth getting studied in additional experiments. The follow-up study supports this conclusion (cf. fig. 9, tab. 3), that the value of internet-ads has to be reconsidered.

Finally all target pictures in the follow-up study suggest that the implemented "Sponsored (i)" labels do not reach the beholder’s visual attention. This finding is supported by the fact that those labels were not clicked. Referring to Edelman and Gilchrist (2012) those indicators of advertising are deeply bound to linguistic processes and therefore ‘overseen’ by the user because this label is not relevant in his eyes. The effect of a clear naming of those labels found by Edelman and Gilchrist (2012) is supported by the results concerning the TFF of the three target pictures. One may see easily that Google’s own ads and own results are faster fixated and for this processed by the user. One has to highlight that the organic links on the “iPod” SERP were fixated for the first time only after 3.5 seconds in average! This is a long period, even for high-involved users (Puto & Wells, 1984; Sawyer & Howard, 1991). To adhere to Google's example, and to save time, the original mockup screenshot from their commitments paper was used, which contained Apple.com as first ranked organic blue link. Further testing on SERP examples without the very well known brand Apple leading the organic blue links, might show less attention and clicks to this position and even more in the product images. Additionally the rare clicks on any alternative content and its rare visual attention indicates that those alternatives of Google’s competitors are evoking no interest from recipients. This impression is supported by the results of the other two SERPs. Having the first study in mind one has to conclude that Google’s new style guide will not lead to a more fair competition. Maybe this is why Monique Goyens used the term “Google is becoming a gatekeeper” (Goyens, 2014, 31-July-2014) during her reply to Josquín Almunia.

But to be honest, maybe the presented results are moderated or mediated by the kind of instruction that was given to the participants. Participants tried to receive information as soon as possible. They were, as Hassenzahl (2003) called it, in a goal mode where people focus on a task. If the trigger hadn't been a goal mode but an action mode (e.g. simply having fun), maybe during the use of social net applications, subjects would have broadened their perceptual field more and spent more attention on additional information (Solomon and Leigh, 1984). The method of instruction is one of the limitations of the reported study. The limitations of this study and the follow-up, next to the method of instruction, were the small sample size and the shortened validity caused by the laboratory setting, as well as the use of static images of SERPs instead of dynamic SERPs. Finally, the sample's recruitment was not by chance and that limits the results' generalizability. For an extension of this study it will be useful to use a straight between-subjects design with parallel groups and lager sample sizes allowing a verification of the effects stated above. Additionally, more parameters in sense of a concept of stress should be used like pupil dilation (Henckens et al., 2009), galvanic skin reaction (Strasser et al., 2009) and heart rate variability (Berntson and Cacioppo, 2004), to extend the current pilot study. All in all more empirical studies facing the inferential aspects of communication with providers of internet-based services seem to be fruitful.

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