How Feature Changes of a Dominant Ad Platform Shape Advertisers' Human Agency

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Abstract

Businesses are increasingly delegating activities in the advertising process to dominant online advertising platforms. This delegation yields the ad platforms tremendous power, akin to the principal-agent dilemma discussed in economics. One of the major platforms is called Google Ads – this platform is the focal point of our study. Over the years, Google has made substantial changes to its platform's features which, in turn, govern what is possible and what is not for the advertisers. These changes impact the *advertisers' ability to act independently and make their own choices,* referred to as *human agency*. To better understand this impact, we examined 362 industry news articles reporting changes in Google Ads from 2015 to 2020. The findings indicate that while most changes increase human agency, this effect is becoming weaker over time, driven by automation. To better understand advertisers' attitudes towards automation, we surveyed 193 advertisers with Google Ads experience. Contrary to the popular belief that marketers are afraid of being replaced by algorithms, we found this to not be the case. Even though most advertisers indicated appreciation for maintaining their human agency, they did not perceive this agency being violated by the ad platform. However, we did observe interesting variability among respondents, reflected in three computational advertising attitude types: *tinkerers*, *instrumentalists*, and *shepherds*. We discuss the implications for advertisers in terms of strategizing in the face of reduced human agency and for ad platforms in terms of designing features that advertisers perceive fair.

Keywords: online advertising; advertising automation; digital marketing; human agency; Google

INTRODUCTION

Online platforms command tremendous power in the advertising industry [21; 43; 61; 64; 75]. These platforms decide which ads will be shown to what users and at what price [4; 62; 77; 82]. The structure of the online ad market is similar to many electronic markets, with intermediaries routing buy and sell orders [22; 64]. For example, in the United States (US), 86 percent of online display advertising space ('display ads' henceforth) is purchased and sold in real-time through electronic advertising exchanges or platforms [64]. Google operates the leading trading platform, Google Ads, that sells ad space on search, YouTube, other Google properties, and third-party websites [54; 61]. Through this platform, Google is the world's largest ad-space seller across all major digital ad types, including sponsored text, video, and banner ads [21; 22; 54; 64]. Google's search engine, other consumer products (e.g., YouTube, Maps), and advertising are integrated—advertisers bid for ad placements using Google Ads [40].

Because the dominant ad platforms, including Google Ads, have extensive control over the online advertising process, this position of power calls for careful scrutiny [21; 22; 77]. Theoretically, the relationship between advertisers and ad platforms is a special case of principal-agent setting [14], in which advertisers delegate multiple tasks in the advertising process (e.g., pricing, targeting, ad creation) to the platform either partially or fully. However, there is little research concerning how feature changes influence advertisers' human agency in online ad platforms [18; 40; 41] as a result of these changes. In this research, we define human agency *as the capacity of advertisers to make choices and act independently concerning the implementation of online advertising.* Examples of advertising implementation choices include aspects such as ad creation and placement, targeting, bidding, budgeting, and setting campaign parameters; parameters considered in the domain of computational advertising [79].

As of the date of this study, Google has a 29 percent share of the $137 billion digital ad market in the US[1], being a prominent player at every layer between advertisers and websites, and providing tools for buying and selling online ad space on Google's own platforms and third-party websites [22]. Google's increasing dominance of the online advertising market led to a lawsuit against the company in October 2020, accusing Google of being *"a monopoly gatekeeper for the internet"* engaging in *"anticompetitive tactics to maintain and extent its monopolies"* [69]. Despite these adamant concerns, little academic work addresses the power of advertising platforms [3; 54], such as Google.

Our research addresses this gap by analyzing whether changes in Google's ad platform limit advertisers' choices or not, specifically *analyzing how changes in the features of major advertising platforms—in the case of Google—affect advertisers' human agency*. A 'feature' is defined as *a functionality in the platform itself that is instrumental in the advertising process*. For example, adjusting click price is a central feature in online ad platforms [30]. Features govern what is possible or not within the ad platform, e.g., whether the advertisers can determine the price per ad click or whether the system does this on their behalf. Because features essentially affect all aspects of advertising within the platform, any addition, removal, or change of a feature's behavior can, at least in theory, impact advertisers' human agency. More particularly, when Google implements a feature change in its ad platform, this change is rolled to millions of advertisers nearly instantaneously [54; 61]. Therefore, any changes to the platforms have large-scale ramifications for the actual work carried out by online advertisers in their daily jobs and, in time, to the online advertising industry as a whole. In theory, several factors can lead to changes in an ad platform's features, including the platform owner's economic interests [23].

Human agency matters because of two main drivers: (a) perceiving freedom of choice as a value in itself, and (b) advertisers essentially seek to provide value in the advertising process by ensuring that

[1] https://www.statista.com/statistics/242549/digital-ad-market-share-of-major-ad-selling-companies-in-the-us-by-revenue/

the decisions are aligned with the firm's broader goals [24]. Moreover, losing human agency can also have a tangible effect on advertisers' livelihoods—when automation replaces manual work, billable working hours are reduced, forcing advertisers to seek new ways of providing value. By automation, we mean the technique of making an advertising technique or process operate automatically. This view of automation aligns with Li's (2019) evolution of digital advertising to *intelligent advertising*, whereupon human marketers and algorithms collaboratively work to achieve marketing goals.

To address the foundational elements of our research purpose, we focus on two primary research questions (RQs):

RQ1: *What are the feature changes has Google made to its ad platform over time?*

RQ2: *How are the feature changes in Google's ad platform affecting advertisers' human agency?*

Advertising research has particularly drawn attention to technological progress, including artificial intelligence (AI) and machine learning (ML). These technologies enable automated decision making [27; 39; 42] and can thus replace manual optimization work [70]. In a similar vein, the electronic marketplace has been affected by privacy and consumer rights issues [67; 71], which can influence feature changes. While legislation grants consumers more control over the personal information that businesses collect about them, how these factors influence the feature changes in ad platforms is not well understood. Thus, to generate a better understanding, we pose our third RQ:

RQ3: *How are the feature changes in Google's ad platform associated with trends of (a) AI and ML and (b) privacy?*

Finally, there is a need to understand how online advertisers perceive their human agency amidst the dominant advertising platforms and algorithms. To this end, we pose our fourth RQ:

RQ4: *How do advertisers perceive their human agency in Google's ad platform with respect to the trend in feature changes?*

We address the three first RQs by examining industry news articles from 2015 to 2020 that cover feature changes in the Google Ads platform. The analysis focuses on the addition, change, or removal of features in Google's Ad platform. The fourth RQ is addressed through a survey of industry advertising experts with 193 qualified responses. Through these findings, we generate deeper understandings within the advertising domain [9] of how changes by and in major advertisement platforms affect advertisers' human agency and how advertisers perceive their human agency amidst increasing automation, both critical but understudied topics in electronic commerce [50].

LITERATURE REVIEW

Google's Dominance of the Online Advertising Market

Google offers more than 81 different customer-facing products [19], many of which can be used to serve ads (Zenetti et al. 2014; Morton, 2020). In 2020, 80.5% of Google's revenue was derived from its various roles in the digital advertising market. In addition to search ads, a substantial portion of that revenue originates from the sale of display space by various Google properties [65]. The company owns a number of products that offer supply for display ads, including Google News, Google Maps, and Google Play [19]. Through its wide array of auxiliary services that are typically offered for free to consumers, Google leverages the so-called two-sided network effects [2]—the more consumers use Google's services, the more valuable the access to those consumers becomes for advertisers [56].

Morton and Dinielli (2020) offer deep insights into Google's dominance in the digital advertising market, showing that, together with Facebook, Google owns and operates 60% of display inventory in online advertising. As an indication of its dominance, in the United Kingdom (UK), The Competition and Markets Authority (CMA) of the UK government found that 95% of web users access at least one Google-controlled site or app each month [20]. As owner and operator of that inventory, Google ultimately chooses which ads are placed there and at what price, as well as setting standards for

the entire online ad industry. Concerning search inventory, the CMA concludes that Google Search constitutes approximately 90% of the total supply [20], rendering Google search a *de facto* natural monopoly in sponsored search ads [31].

This level of marketshare, combined with its persistence and entry barriers, are strong indicators of market power, which Google could exploit to its advantage, as the theory of monopolies suggests [6]. Another way to understand Google's dominance as a supplier is to consider the distinction between "owned and operated" supply—i.e., the ad seller both owns ad placements and controls ad delivery within those placements. Ad supply that is owned and operated is more valuable than supply that is purchased on the open market because the owner—in this case, Google—can use its platform to direct buyers to its own supply rather than to third-party owned ad supply, as well as influence the price at which the ad space is sold [50].

Against this backdrop, analyzing Google's relationship with advertisers appears a relevant, impactful, and underexplored research topic [61]. We proceed by formulating hypotheses based on previous research in human agency and automation.

Agency-Theoretic View on Online Advertising

Agency theory has been used by scholars to explain how actors strategically behave in several domains, including accounting (e.g., Morris 1987), law (e.g., Lan and Heracleous 2010), marketing (e.g., Tate et al. 2010), supply chain management (e.g., Fayezi, O'Loughlin, and Zutshi 2012), and organizational behavior (e.g., Eisenhardt 1989). The theory is concerned with the agency relationship, in which one party (the principal) delegates work to another (the agent), who then performs it [14]. A principal is someone who places a high level of trust in an agent to carry out specified financial decisions and transactions with potentially volatile outcomes [15].

Agency theory helps understand problems that can arise in agency relationships within the online advertising industry [58]—in our case, between Google (agent) and the advertisers (principals).

Agency problems occur when parties working together have different goals and divisions of labor. First, (a) the desires or goals of the principal and agent may conflict, and (b) it is difficult or expensive for the principal to verify the actual actions of the agent due to information asymmetry; that is, the agent knows more about their actions than the principal [53]. The fundamental problem is that the principal cannot verify that the agent acted appropriately. Second, there is a risk-sharing issue that arises when the principal and agent have opposing risk attitudes. The issue here is that the principal and the agent may prefer different actions due to differing risk preferences [14].

In the case at hand, the power dynamics favor Google (and most online advertising companies that offer advertising platforms) over advertisers [58], as Google controls the majority of the critical aspects of online advertising exchange, including pricing [30], ad ranking [40; 61], matching search queries for a given ad [32]. Furthermore, the agent—Google—has detailed information about the events occurring in its ad marketplace and the algorithms that govern these events. That is, Google maintains an information advantage relative to the advertisers [58]. For example, if Google aims to maximize its profit, it may develop features that conflict with a particular advertiser's interests. Google may also want to decrease the opportunity for advertisers to gain a competitive advantage by using the available features better. The more automated the ad platform becomes, the less opportunity there is for gaining a competitive advantage through manual optimization. We, therefore, formulate the following hypothesis (H):

H1: *Feature changes in the Google advertising platform generally decrease advertisers' human agency.*

The Role of Automation, Artificial Intelligence, and Privacy

Various studies and terminologies have been used to associate automation and digital advertising [3; 54; 82]. For example, using automation for advertising is sometimes referred to as computational advertising—defined as advertising activities supported or enabled by computational tools

and algorithms [79]. The automatic buying and selling of ad space is called programmatic advertising [8]. All these terminologies essentially describe the underlying, ongoing transformation in the nature of advertising—a transformation that predominantly shifts decision-making power from human actors to algorithms and "intelligent" systems, although the degree of actual intelligence in these systems remains to be determined [55]. Nonetheless, automation is a central theme that can potentially explain some of the feature developments occurring in online ad platforms. Moreover, it allows optimization activities for campaign management, including activities such as ad creation, consumer insight discovery, media planning and buying, and reporting [55]. Driven by these opportunities, we propose the following hypothesis:

H2a: *Machine learning and artificial intelligence are drivers of feature changes in the advertising platform that increase automation, which decreases advertisers' human agency.*

Along with automation, society at large is becoming increasingly concerned about privacy and consumer rights [3]. The aspect of data ownership has been put at the forefront of digital transformation [67; 71], driven by concerns about political advertising [25]. In addition, consumers are becoming increasingly aware of privacy issues [57]. The repercussions of these issues extend to online advertising platforms as well [37], evoking questions about how platforms are used for purposes that have societal ramifications [57]. Authorities have responded by enacting new legislations that provide consumers greater control over the information platforms collect. Therefore, it is logical to assume that the increasing concern of legislators and consumers regarding online platforms' use of data is associated with changing features of ad platforms, as these considerations may shape platforms' decisions about the features provided to advertisers. Therefore, we propose the following hypothesis:

H2b: *Legislation and regulation to protect privacy and consumer rights are drivers of feature changes in the advertising platform are associated decrease advertisers' human agency.*

METHODOLOGY

Overview

Inspired by previous research that focuses on analyzing the advertising industry via press coverage [48] and addressing the call for systematic analyses of interactive advertising [12], we conduct an analysis of trade press (i.e., content aimed at a specific industry and the people who work in that industry) coverage of the online advertising industry. Trade press, and news articles in particular, provide a perspective into both incremental and transformative events taking place in the online ads industry—in this case, on Google's advertising platform.

News articles provide a comprehensive coverage of changes in the ad platform. Google shares information about changes in its ad platform primarily in three ways: (a) *a webpage* that lists the main changes for the past two years[2], (b) *a blog* that explains and provides context for the major changes as well as general industry insights[3], and (c) *release notes* that are visible on the user interface. Each of these has limitations. The website has a limited history to only the past two years, making it incompatible for longitudinal analyses. The blog only covers the largest changes that are transformative, whereas we are interested in all types of feature changes. Finally, the release notes are not archived in a publicly available repository. In contrast, trade publications provide helpful information for monitoring the actions of online advertising platforms, reporting each change—whether large or small—to their readers, because the readers consist of online advertising professionals who need to be aware of the changes and immediately apply them in their profession.

Data Collection

Both incremental and transformative feature changes do matter because changes can be gradual, similar to the "slow-boiling frog" effect [13], in which, one small step at a time, the advertising industry

[2] https://support.google.com/google-ads/announcements/9048695?hl=en
[3] https://blog.google/products/ads-commerce/

can transform in a relatively short period of a few years. For this reason, we chose the examination of six years (2015-2020) and sought to locate all applicable articles regardless of the level of feature coverage. During this time, ML [51] has become more pervasive in advertising, and its emergence is likely reflected in Google's design choices for its ad platform's features. Therefore, the selected time window offers a fruitful starting point for analysis.

For data collection, we used two reputable industry news sources: *Search Engine Land*[4] and *Marketing Land*[5]. These venues have covered news in online advertising since 2006. They are published by Third Door Media, an independent media firm created by two internet marketing specialists in the US. We searched both sources for news articles dealing with changes in Google's advertising platform. We perused the news headlines for terms such as "Google Ads", "Google AdWords", "YouTube Ads", and references to advertising content (e.g., keywords, targeting, bidding, etc.) [43].

Because Google is a dominant online ads platform, it represents a relevant case for addressing our research questions, as case study literature proposes [81]. In total, we screened roughly 500 news articles. Articles not reporting a feature change in Google's online ad platform (<30%) were not included in the sample. The excluded articles did not report a change in Google's ad platform. Thus, the exclusion criteria included a mismatch between the news article's content and the purpose of the study—i.e., investigating changes to Google's online ad platform.

Furthermore, we applied two techniques to ensure data quality. First, we used the Google search engine to locate relevant news articles in sources other than the two primary sources we used, including Google's official news page for the limited history it provides. This exercise showed that the same changes were reported in other industry news sources, thus lending further credibility to the news sources we deployed. For example, Google's removal of "rotate evenly" from YouTube Ads was reported in

[4] https://searchengineland.com/
[5] https://martech.org/author/marketing-land/

multiple outlets (e.g., IN Cart Marketing 2016; MarTech 2016; The Channel Report 2016). Second, another researcher reviewed a sample of the results for a "sanity check" [5], i.e., that the screening results matched what would be expected.

Our final dataset contained 362 news articles published in the two news outlets. In Figure 1, we illustrate the number of articles per year in our dataset. After identifying the news articles, we record the whole text of each article in a text file. Simultaneously, we recorded the web address (URL), publication date, publication outlet (e.g., "Marketing Land"), and the author(s) of each article in a spreadsheet.

[Please Insert Figure 1 About Here]

Data Analysis and Reporting

To analyze the data, we first arranged the articles in chronological order. Next, we read each article to analyze and understand whether it offers an indication of a feature change on the platform concerning human agency from the perspective of the advertisers. Accordingly, against each article, we manually coded whether the reported feature changes affected the advertisers' human agency:

- **A <u>negative</u> impact on human agency refers to a loss of choice and independence**—an example would be the article "Ability To Share Ads Via AdWords Shared Library Is Going Away" (January 2015). With this change, advertisers could no longer share certain information with others.
- **A <u>positive</u> impact on human agency refers to a gain of choice and independence**—an example would be the article "AdWords Search Query Data Now Available Sooner" (March 2015). With this change, advertisers can access more timely data and therefore make more informed decisions.
- **<u>Neither</u> refers to the absence of changes to human agency**—an example would be the article "AdWords To Require Verification For Call And Location Extension Phone Numbers" (April

2015). This change does not limit the access of advertisers to a specific feature, as long as they verify their account, which is a reasonable request.

The coding procedure followed the approach of qualitative content analysis (Strauss and Corbin 1998). The coding of the material was carried out by one of the researchers. Another researcher verified the quality of the coding by reviewing the coding results. The disagreed cases were discussed until the researchers were in agreement on the final classification. All recorded events, including those coded as increasing human agency or having no effect, are made available in the supplementary material[6].

FINDINGS

H1: Features changes in the Google advertising platform generally decrease advertisers' human agency.

Our analysis shows that out of the 362 news articles (2015 to 2020) that were analyzed in this study, 75 (20.7%) indicated a negative impact on advertisers' human agency, whereas 230 (63.5%) showed a positive impact. Fifty-five articles (15.2%) did not indicate either (see Table 1). Except for 2019, the proportion of changes affecting advertisers' human agency negatively has been steadily increasing (see Figure 2). Although the years 2015 to 2019 show a greater total number of increasing human agency than decreasing or neither, the gap narrows over time (see Table 1).

[Please Insert Table 1 About Here]

[Please Insert Figure 2 About Here]

Figure 2 indicates two major findings: (a) predominantly, the changes in Google's ad platform increase advertisers' human agency through new opportunities (see the orange area in Figure 2a), but (b)

[6] https://www.dropbox.com/s/iufxv44pv5micto/supplementary%20material.xlsx?dl=0

there is a slightly decreasing trend in advertisers' human agency over the past five years (the blue area in Figure 2a). To further examine the news articles' content, we used standard dictionary terms to devise two lexicons—expansive and contractive—aiming to reflect whether the articles emphasized ad platform changes as expansive (i.e., bringing something new) or contractive (i.e., taking something away).

[Please Insert Table 2 About Here]

Results in Table **2** show that expansive terminology was much more common than contractive terminology. This supports the results in Table 1 and Figure 2, in that most features seem to give new opportunities to advertisers instead of restricting their choice. Therefore, **H1 is <u>not</u> supported: Overall, most new features in Google's ad platform <u>increase</u> advertisers' human agency rather than <u>decrease</u> it. However, advertisers' relative human agency appears to decrease over time.** In the following subsection, we present a year-by-year detailed analysis of the changes in the ad platform, with examples illustrating how specific instances increased or decreased advertisers' human agency.

Changes in 2015

During 2015, several new features were added to Google's advertising platform, with varying impacts on advertisers' human agency (see Table 3).

[Please Insert Table 3 About Here]

During 2015, advertisers lost some collaborative features, i.e., the ability to share specific data with others (**A** in Table 3). They also lost the ability to display social media follower numbers in search ads (**C** in Table 3). Finally, the conversion action shown in the reports was narrowed down to only include Google's definition of optimized conversions (**B** in Table 3). Most of the changes made by Google also benefitted advertisers, based on automation's added value, without decreasing advertisers' human agency. By expanding the availability of features—in comparison to previous features offered by the platform—advertisers gain new capabilities, thereby increasing their human agency. Such features include new types of reports and interactions (**D** in Table 3), enhancements to AdWords shopping

campaigns (**E** in Table 3), new programs for hotels and small businesses (**F** in Table 3), and the addition of flexible bidding strategies in AdWords (**G** in Table 3). Overall, most of the changes in 2015 indicate a positive impact on advertisers' human agency (n=51; 83.6%), followed by news articles that show no impact on advertisers' human agency (n=6; 9.8%). Only a few news articles (n=4; 6.6%) indicated a decline in advertisers' human agency.

Changes in 2016

The following year, 2016, saw much more changes, both in terms of frequency and their impact on advertisers' human agency, than in 2015. Example articles are presented in Table 4.

[Please Insert Table 4 About Here]

Changes decreasing advertisers' human agency included, for example, controlling how the ads look like by removing emojis as a stylistic choice from advertisers (see **A** in Table 4), automatically applying bid prices to specific campaign types (**B** in Table 4), removing metrics (**C** in Table 4), banning specific product categories from the platform (**D** in Table 4), removing market research statistics from small advertisers (**E** in Table 4), and decreasing advertisers' options to run experiments independently on the platform (**F** in Table 4). Changes increasing advertisers' human agency in 2016 included, for example, new (optional) automated bidding strategies (**G** in Table 4), improvements on usability (**H** in Table 4), and expansion of advertisers' possibilities to import customer data and target their pre-existing customers (**I** in Table 4). Further changes include new text ad format with more character space (**J** in Table 4), option to run experiments on the display network using Google's experimentation tool (**K** in Table 4), and providing more information for planning (**L** in Table 4).

Overall, most of the industry news articles published in 2016 indicated a positive impact on the human agency of the advertiser (n=66; 76.7%), followed by decreased agency (n=11, 12.8%), and news that indicates neither (n=9, 10.5%). While only a relatively small number of changes reduced advertisers' human agency, among those that did, some changes can be considered alarming, such as placing smaller

advertisers at a disadvantageous position (**E**) and limiting advertisers' ability to conduct their independent testing of platform features (**F**). The overall dynamic of the changes is interesting in that despite **E** and **F**, contrary changes improve human agency for said features (**L** and **K**, respectively).

Changes in 2017

In 2017, Google continued to increase automation features, as presented in Table 5.

[Please Insert Table 5 About Here]

Changes decreasing advertisers' human agency diminished advertisers' control over what searches their ads are targeting (**A** and **B** in Table 5), decreasing advertisers' choice for rotating ads in a campaign (**C** in Table 5), and changing how conversions are measured (**D** in Table 5). Among the changes that increased advertisers' human agency were new collaborative data analysis features for teams (**E** in Table 5), new metrics to understand customer behavior (**F** in Table 5), support for seasonal sales (**G** in Table 5), and more advanced targeting options that advertisers could configure using the platform (**H** in Table 5). Like the previous years, 2017 shows a higher positive impact on advertisers' human agency (n=41; 62.1%), followed by news articles that indicate a decline in their human agency (n=18; 27.3%), and news reporting neither (n=7; 10.6%). Important to note here is that compared to 2015 and 2016, when advertisers' human agency decreased by 6.6% and 12.8%, respectively, there was a sudden jump in 2017—as 27.3% of news articles indicated a decrease in advertisers' human agency this year.

Changes in 2018

In 2018, "Google AdWords" changed its name to "Google Ads" and rolled out several changes and automated features (see examples in Table 6).

[Please Insert Table 6 About Here]

Changes in 2018 are strongly influenced by political and societal considerations, perhaps owing to the increasing politicization of society during this period [44]. Changes that decrease advertisers' human agency focused on limiting where the ads can be seen (**A** and **D** in Table 6), and what type of

products can be advertised (**B** and **C** in Table 6). Changes that increased advertisers' human agency included, for example, easier access to campaign settings (**E** in Table 6), new information on campaign performance (**F** in Table 6), new ad formats (**G** in Table 6), and more detailed metrics on an advertiser's competitive standing in the ad auction (**H** in Table 6). Overall, the news articles published in 2018 continued the trend of a higher portion of news articles indicating positive impacts on advertisers' human agency (n=29; 44.6%). However, the percentage of news articles that showed negative impacts increased even further (32.3%; n=21) compared to 2017 (27.3%), indicating a further decline in advertisers' human agency.

Changes in 2019

The year 2019 shows a reversal in direction—as the trend of increased negative impact on advertisers' human agency reversed course for the first time. Examples are offered in Table 7.

[Please Insert Table 7 About Here]

Changes decreasing advertisers' human agency included, for example, the removal of keyword bidding options (**A** in Table 7), showing recommendations that Google perceives as useful more prominently in the ad platform's user interface (**B** in Table 7), expanding the previous change of limiting advertisers' control over the search terms they bid on (**C** in Table 7), and removing the option to use effective click price in portfolio bidding strategies (**D** in Table 7). Although **B** does not directly decrease advertisers' human agency, we classified it so because the recommendations are feasible to apply in the user interface—recommendations thus *indirectly* limit the advertiser's human agency by promoting impulsive choices. They include increasing bid prices, without a clear explanation of why Google recommends the action and the subsequent benefits for Google—e.g., recommending advertisers to bid higher on certain keywords, which would directly benefit Google's revenue.

Changes that increase advertisers' human agency included, for example, better planning tools for controlling one's budget (**E** in Table 7), enabling more options for bidding (**F** in Table 7), making it

possible to apply geographic targeting (**G** in Table 7), and improving reporting of campaign performance (**H** in Table 7). **G** and **H** signify Google's intent to go beyond the classic search campaigns. In 2019, the number of news articles that indicated a positive impact on advertisers' human agency was 31 (66%), followed by 8 (17%) articles that showed a negative impact. Eight other articles (17%) did not offer any insights on the impacts on advertisers' human agency.

Changes in 2020

Exemplary articles that indicate both negative and positive impacts on advertisers' human agency in 2020 are presented in Table 8.

[Please Insert Table 8 About Here]

Several changes in 2020 decreased advertisers' human agency. These include, for example, making "smart" campaigns the default option for new advertisers (**A** in Table 8). Other changes that reduced advertisers' human agency include prohibiting the use of demographic variables in targeting (**B** in Table 8), removing advertisers' access to long-tail search terms (**C** in Table 8), making information more difficult to locate (**D** in Table 8), and automatically applying recommendations without leaving records of such edits (**E** in Table 8). Out of these, **E** is especially alarming, as the *Change History* feature in the platform is intended to serve as a reliable record of any changes taking place in the advertiser's account. Making changes automatically to an advertiser's account and not recording them in the *Change History* could be interpreted as violating the purpose of keeping a record in the first place.

There were also changes that increased advertisers' human agency. These include, for example, giving more options for advertisers to simulate the impact of different bid strategies on their campaign results (**F** in Table 8), and making shopping campaigns available to more advertisers (**G** in Table 8). Other examples include giving advertisers access to data on trending customer behaviors (**H** in Table 8), and enabling the collection of customer information via forms on YouTube as well as integrating Google campaigns with external services (**I** in Table 8).

Starting from 2015, 2020 was the first time when the number of news articles indicating a negative impact on advertisers' human agency (n=13; 35.1%) outnumbered the ones that showed positive impacts (n=12; 32.4%), albeit the relatively smaller number of articles. Another 12 articles (32.4%) did not offer any insights on changes in advertisers' human agency.

H2a: Machine learning and artificial intelligence are drivers of feature changes in the advertising platform that increase automation, which decreases advertisers' human agency. and H2b: Legislation and regulation to protect privacy and consumer rights are drivers of feature changes in the advertising platform are associated decreased advertisers' human agency.

To address H2a, we compile two lexicons based on semantic relevance, i.e., by choosing words that reflect, on the one hand, the automation theme and, on the other hand, the privacy theme. Comparing the results in Table 9 and Table 10, we can observe that the articles mention the automation theme much more frequently than the privacy theme. For example, "automatic" is mentioned 67 times (in 18.5% of all articles), whereas "privacy" is mentioned only 13 times (in 3.6% of the articles). No article mentions "consumer rights". Interestingly, "artificial intelligence" is mentioned in only four articles (1.1%), whereas 46 articles (12.7%) mention the term "machine learning". ML and AI both refer to computational systems' human-like capabilities—intelligence and learning—but ML is seen as a more applied form of technology [34], which might explain this finding. "Feed" (n=33, 9.1%) is another central term for automation; for example, e-commerce product feeds enable automatic ad creation based on product information.

[Please Insert Table 9 About Here]

[Please Insert Table 10 About Here]

The results, therefore, support the first but not the second part of **H2a: Changes in the advertising platform are associated with (a) automation opportunities brought about by ML and AI, but much less by (b) legislation and regulation to protect privacy and consumer rights.**

HOW ADVERTISERS PERCEIVE GOOGLE'S IMPACT ON THEIR AGENCY

Approach

To complement the findings from the blog analysis, we asked advertisers about their experiences with Google Ads via an online survey (see demographics in Table 11). The sample includes participants from 26 nationalities (see Table 12). All work in the "Marketing & Sales" sector, according to the categorization of the survey platform we used for data collection (the platform's name is Prolific [52]). We only encouraged respondents to take the survey if they had experience in using Google Ads. In total, we received 210 responses, out of which we rejected 17 (8.1%). Out of these, two were due to them being internal testing, 1 being a repetitive response pattern, and 14 due to exhibiting a suspicious open-ended response to the question asking to describe one's experience with Google Ads (e.g., indicating that the participant only studied the topic or that they were only consumers of ads, not advertisers). Thus, 193 (91.9%) responses remained in the analyzed dataset.

[Please Insert Table 11 About Here]

[Please Insert Table 12 About Here]

Quantitative Results

The results indicate that human agency is generally perceived as important by online advertisers. Figure 3 illustrates that the most important aspect is targeting, followed by budgeting. The least important aspects for human agency are setting keyword bid prices and choosing which specific ad is shown among the ones the advertiser has created. The average advertising agency preference (i.e., the macro-average of the scores of the seven factors) is 4.2 out of 5, which can be considered a high number (i.e., human agency is important for online advertisers).

[Please Insert Figure 3 About Here]

[Please Insert Figure 4 About Here]

However, high standard deviations (SD) in Figures Figure 3 and Figure 4 imply there is strong dispersity among the respondents, i.e., different attitudes for these topics. Especially the fear of being replaced varies a great deal (SD = 1.33). Because all statements provided the same scale (1-5) to all respondents, SD can be directly interpreted as how much variability the statements contain. Furthermore, we can compute the coefficient of variation (CoV, also known as relative SD), which is simply the SD divided by the mean. In other words, a higher CoV value indicates the responses have more variability relative to a lower CoV value.

The results (see Table 13) indicate that advertisers are most split about their fearful reaction to being replaced by automation and their views regarding if Google has decreased human agency during the time they have worked in online advertising. In contrast, there is the least disagreement about Google Ads' recommendations; most advertisers view these in a positive light (see Figure 4).

[Please Insert Table 13 About Here]

Future work is required to investigate what conditions explain where these attitudinal differences among the advertisers stem from.

Qualitative Results

General Analysis

We asked the respondents to elaborate on their numeric answers. These elaborations reveal several interesting insights into advertisers' thinking about human agency, automation, and the role of both algorithms and humans in the advertising process. Most respondents thought it is generally important to maintain control but selectively make use of automation:

- R2: "For me it's very important to select the keywords, products and create my own ads. However, for campaign optimization sometimes I keep Bid prices Auto.";

- R3: “Well, when it comes to money, I want total control, as this affects by ROAI. Plus, if Google is going to rip me off, it would be with money. However, there are some things when Google’s algorithms could help me that I really don’t care that much about -- such as ad rotating when A/B testing.”

However, other respondents were adamant about maintaining human agency at all times:

- R8: “I believe that the user should have absolute control on what, when and how they should advertise.”;
- R11: “I honestly don’t like when Google is using algorithms to improve my campaigns because I don’t feel like I have control over actions. I like to make changes and to see how they influence on future results.”;
- R13: “For me it’s important to be able to own my ads in every sense. I don’t like when I don’t have the freedom to make my own choices (it could be the design, the budget, the sizing, the target)”.

Delegating aspects of advertising work to Google tends to focus on aspects that are considered less critical for the advertising process:

- R14: “I would like to have control over the top settings, but down to the smaller details like bids and which ads are shown, it’s more beneficial for Google to optimise these.”;
- R16: “I like having control of my ads but also don’t mind when the platform automates some tasks, like showing the right titles or descriptions to the right people or showing the ads it thinks will have the better result.”

However, the delegation can also focus on creative aspects for some advertisers:

- R10: “I want to be free to set what I want, but I am with letting google ads creating the right ads because sometimes their work is better than mine”)

Therefore, there is a broad spectrum of preferences regarding human agency in online advertising which seems to be associated, on the one hand, with advertisers' mental model of the advertising process (i.e., what they see as important aspects for human involvement) and, on the other hand, established notions of where automation can alleviate their work burden.

Targeting was considered the most important for human agency:

- R4: "Choosing ad targeting is essential in reaching the right campaign target audiences, so I'd rate it as the most important factor out of all of them listed above :)";
- R6: "Its very important to me that the ad is targeting the right audience and that the ad has the right messaging that speaks to the consumer (hence I would want to create my own ads). The more control I have the more targeted it can be.").

Besides targeting, other human agency aspects were also considered important as well, including

- *ad creation* (R7: "It is very important that google ads allow a complete customization of the advertising to be able to reach a specific objective, according to the products or services that are offered."),
- *budgeting* (R12: "when a budget is set out for me, it can sometimes be above what i planned which negatively affects me"; R34: "If numbers decide which one of my ads are shown for me to make the best profit I'm okay with that but the marketing budget is tight so it's important for me to know how much I spend beforehand"; R43: "Cost is a huge factor in our marketing, so being able to control 100% of the budget is key."),
- *campaign settings* (R17: "i like automation with bidding and ad performance but prefer setting up the campaign"), and

- *combinations thereof* (R30: “I work for small - medium sized companies and their budgets to advertising is always short, I must be sure to apply the allocated funds wisely, that means extreme importance on setting my bid prices, and target. Choosing which product/service I am pushing and when is also extremely important due to demand fluctuation.”; R42: “I like the automatedness of some things within Google, but for the most part, I want to be making the main decisions on what the ads look like and where they go”; R37: “It is important to me to have full creative control of the ad and control over my budget. My company gives me a set budget that I can work with so that is a top priority for me.”).

Particularly striking seems to be the concern that, should the algorithm be given free hands, it would end up overspending or wasting the advertiser’s budget (R1: “I like to have control over bid and budgets since Google ads tends to overspend if given a free hand.”; R51: “i have to work with the budget the clients have (usually limited), so, i need to have more micro-management, at all levels that I can.”). Therefore, fear of overspending seems to be the most common fear related to automation, which reflects the currently dominant performance-oriented view of marketing [11]. This also reflects the advertisers’ need to set optimization boundaries, i.e., being involved in the decision making at a more strategic level.

Computational Advertising Attitude Types

As mentioned in the previous section, there was a great degree of dispersion in the numerical scores obtained from the advertisers, implying the existence of segmented views. To segment the responses, some general attitudinal types, which we refer to as ‘computational advertising attitude types’ (inspired by the concept of computational advertising [79]), can be highlighted. In particular, through an inductive qualitative process, we detected three attitudinal types concerning the changing agency of advertisers, described below.

Tinkerer: One prominent type is "tinkerer," i.e., those interested in manual optimization and working with data (R9: "I like to control my campaign, because i usually run insight or data-based product campaigns."). Tinkerers tend to want to maintain human agency because they trust in their own skills (R19: "By testing and optimizing the ads, I can find the ideal way of advertising for our client"). Tinkerers also perceive automation as "boring," as they are seeking challenge from the marketing profession (R52: "I really enjoy having freedom during planning my campaign ads, as I often feel bored with standard type ads and like to change"), and select campaign types based on the level of human agency (R28: "Prefer to use standard campaigns with maximize customizability as opposed to closed campaigns like smart shopping.").

Tinkerers tend to exhibit a certain mistrust of Google's motives (R41: "google doesn't do a good job of optimzing campaigns by itself as it's only concerned with adspend so I'd rather have control to those options. the reason I chose neutral for specific ads being shown is because I have to wait to see what the data says regarding ads and landers."), while some admit to being "perfectionists" (R45: "I am a perfectionist, as a result it is important for me to make sure that all my things are going according to how i want and i have planned for them to go.).

Essentially, tinkerers see that control gives them more flexibility than if the campaigns were largely controlled by algorithms (R53: "I want to be able to control my campaigns as much as possible, to ensure I'm able to quickly flip target audiences or advertising intensity for example."; R54: "If l set my own budget and design my own campaigns it becomes easier to manage"). Furthermore, exercising human creativity also plays a role among tinkerers' reasons to maintain control (R56: "I enjoy utilizing my own originality in my ads so therefore it is very important to me to create my own ads as well as using my own campaign settings."). Consequently, tinkerers often desire total control (R29: "everything on google Ads is based on what i provide and my preference"; R44: "I like that the ads are completely

controlled by me, how long it stays up, who is target, how much I'm spending on it"; R47: "I need to have flexibility to control all settings").

Instrumentalist: The other extreme is an instrumentalist who does not care about the details and just seeks performance, whether using automation or not (R25: "I'll give google a max budget and let them split it up using their algorithm. But I want to be able to connect with the target audience of my choosing and make my own ads. But I also don't really truly care about any of this."). Instrumentalists perceive automation as a tool that helps them handle the whole advertising process (R36: "it is much easier as you set you own targets while you are being helped on how to grow your business."; R40: "It is important to have a decision about the ads we want to show, however, I think that the suggestions for our Google ads are very beneficial."), and save time (R59: "I usually use smart campaigns as everything is done for me and I don't have to spend too much time on managing the campaign. For me the most important thing is the budget we are spending on the campaign as well as targeting the right audience."). Instrumentalist is closer to a *laissez faire* type of mentality than the other two attitude types.

Shepherd: In between these two extremes, there is a type we call the shepherd that thinks that algorithms can help achieve better results but still require manual human supervision (R27: "It's important to keep some control on my campaigns, in order to optimize costs and ROIs. Google tends to push the automatic bid management system, which isn't a bad idea because the algorithm has more insights on the customers than us, but I need to keep an eye on what the AI is doing with my budget."). Shepherds use the results of automations to uncover new insights, such as completely new ads that were borne from machine "creativity" (R31: "I like the ease of use with smart/dynamic campaigns generated by google — they let us try ads and combinations of things we wouldn't have come up with ourselves. The results can be interesting!"), getting new ideas (R55: "Sometimes help with ideas is very appreciated"; R58: "I like being able to adapt the ad for my business but I also appreciate suggestions and templates provided by Google").

Because Google Ads provides automated recommendations for advertisers to improve campaign performance, using these recommendations was seen by the shepherd type as a good midpoint between automation and control (R18: "I like to use google ads because although I have a certain freedom of choice, some decisions are recommended to me by the platform and this helps me in managing my ads"; R23: "The more control I have over my campaigns, the better. Although suggestions are appreciated too."). The shepherd type tends to have a trusting attitude towards Google's automation, but they also prefer to keep the "last word," e.g., by setting boundaries that the algorithm cannot exceed (R39: "I think google will serve the best performing ads, so I'm not concerned about them showing the ones I think are the best. I also trust Google's auto bidding as long as I can set a cap.").

Overall, based on the responses, we observed that most advertisers have a very pragmatic approach to combining the strengths of humans and machines toward the optimization of the advertising process and, most importantly, the performance. Several advertisers perceived themselves as "guides" (shepherds) of algorithmic decision making, which corresponds to an interesting paradigm of computer science, namely, human-in-the-loop [26]. According to this paradigm, a domain expert contributes by setting boundary values for the system or algorithm that operates mostly autonomously, while also injecting their knowledge or expertise into the decision-making process, which, in the case of online advertising, takes place through adjusting the settings in the ad platform's user interface. It does, therefore, appear that advertisers find this form of collaboration natural already at this stage, and are mostly pleased with computer-aided facilitation of managing advertising campaigns.

DISCUSSION AND IMPLICATIONS

General Discussion

The majority of Google's changes appear to add features, but adding a feature does not always imply that the advertiser gains more decision-making power [82]. Rather, it can also mean replacing human tasks previously overseen by the advertisers. Hence, a somewhat paradoxical situation can exist

in which Google adds possibilities of the ad platform via machine capabilities while simultaneously removing agency from humans. Given that companies with an industry tend to evolve in a similar manner [35], we expect this trend to hold with other platforms in online advertising. Thus, human labor is being gradually removed from campaign management. The ramifications of this phenomenon warrant academic research on the changing role of humans in online advertising. For example, so-called smart campaigns include a high degree of automation in central campaign management activities. While Google asserts that these campaigns facilitate new advertisers' entry to the platform, new advertisers may become oblivious of the full range of options, such as manually setting the maximum bid to affect the level of click price.

Making automated options default is problematic, as novel advertisers may accept default options without informed analysis [36]. Conversely, larger corporations may have the technical know-how to exploit the full range of platform features. The effect of organization size and expertise on views of human agency is reserved for other research. To a lesser extent, changes to privacy regulations also impact advertisers' agency. Google applies changes to comply with the new regulation by restricting data processing for certain business purposes[7] and/or by acting as a controller or processor of personal data[8]. For Google, the challenge is to deliver relevant ads with the least amount of individual user datapoints possible. This may explain the rise in automated features as control shifts away from the advertiser/platform and toward the consumer, or at least why ad platforms become more reclusive with sharing their users' data with advertisers [25].

[7] https://support.google.com/google-ads/answer/9614122?hl=en-GB

[8] https://privacy.google.com/businesses/compliance/

Theoretical Implications

Our findings belong to the stream of academic studies making sense of automation in advertising. Li (2019) describes the evolution of digital advertising through three stages, going from (a) *interactive advertising* to (b) *programmatic advertising* and finally to what they term (c) *intelligent advertising*. Our study sheds light on this transition towards intelligent advertising from the perspective of changes occurring in the ad platform's features.

As a theoretical contribution, we introduce an online advertising agency framework, based on the idea that human agency is constructed by several independent work tasks (i.e., agency aspects) in online advertising that all contribute to the overall degree of advertisers' *true agency*. Moreover, there is *perceived agency*, i.e., how advertisers themselves see their freedom of choice within the conditions imposed by the ad platform. Finally, there is *agency preference* which refers to the desire to gain agency, i.e., to make one's own choices in the ad platform. All these three constructs govern the decision making of online advertisers using the ad platforms for their work. The true agency sets the overall boundaries of what *can* be done; perceived agency defines what advertisers *think* can be done; agency preference determines what the advertisers *want* to do.

This framework is illustrated in Figure 5, and each agency aspect is discussed thereafter. It is essential to observe that the advertiser's perceived agency does not perfectly align with the *true* agency; this is because, on the one hand, the advertiser is not aware of the full potential of the ad platform's features and functionalities, but only a subset of those and, on the other hand, the advertiser imagines to be in control over some factors over which they actually are not in control (hence the ellipse depicting perceived agency over the true agency in Figure 5).

[Please Insert Figure 5 About Here]

The online advertising agency comprises several aspects that determine the overall agency:

1) **Choosing keywords an advertiser's ad is targeting** (for search campaigns)—affecting *targeting agency*, i.e., advertisers' ability to choose where their ads are shown
2) **Choosing the websites where the ad is shown** (for display campaigns)—affecting *targeting agency*, i.e., advertisers' ability to choose where their ads are shown
3) **Choosing the product being advertised** (for shopping campaigns)—affecting *product agency*, i.e., advertisers' ability to choose what products are advertised to a given consumer
4) **Choosing what ad is shown among multiple alternatives**—affecting *creative agency*, i.e., advertisers' ability to choose the words, pictures, and other creative content, including how the creative elements are combined
5) **Determining the price the advertiser pays for a click**—affecting *pricing agency*, i.e., advertisers' ability to determine how much a visitor is worth to them
6) **Creating advertisements from website content or dynamic product feeds, or by combining text lines a human has written** —affecting *creative agency*, i.e., advertisers' ability to choose the words, pictures, and other creative content, including how the creative elements are combined
7) **Spending less or more budget based on demand**—affecting *spend agency*, i.e., advertisers' ability to set their own fixed budget
8) **Preventing ads about specific topics** (e.g., politics, addiction)—affecting *access agency*, i.e., advertisers' ability to run ads in the platform
9) **Changing settings in the advertiser's account**—affecting the *autonomous agency*, i.e., advertisers' chosen settings remaining independent from the platform's suggestions.

Theoretically, we contribute to the study of electronic advertising marketplaces in predominantly the following ways: (1) we suggest new concepts, including true vs. perceived agency,

agency preference (which we illustrate to vary by different advertiser types), and agency aspects which we break down to nice aspects that cover the essential activities in online advertising. We further (2) typify the concept of human agency into subtypes corresponding to these nine aspects (e.g., creative agency), which enables a more in-depth scrutiny of human agency in e-commerce for future work.

In so doing, we conceptualize and adapt the concept of human agency in a manner that matches the characteristics of the online advertising process. In our framework, there is no "one human agency" but the human agency in online advertising consists of multiple aspects of the advertising process. Because advertisers tend to hold different paradigmatic views to the advertising process (i.e., the importance of different activities and their added value in those activities), feature changes are met with high degree of attitudinal variation (see Figure 6 for an elaboration). This is a theoretically novel way of analyzing agency in online advertising that can be further expanded and utilized in follow-up work.

[Please Insert Figure 6 About Here]

Implications for Advertisers and the Electronic Commerce Industry as a Whole

To advertisers, many of the platforms' changes are *opaque* and lack transparency [16]—i.e., the reasoning behind their implementation is missing, leaving the advertisers powerless to contest any changes in case these would harm their interests. Perhaps the most influential implication for advertisers is that creativity, the advantage traditionally associated with human capability [63], is being appropriated by algorithms. As noted by Vakratsas and Wang, *"creativity is not an elite privilege but rather a systematic process which can be aided by data and computation"* [72] (p. 39). A general principle is that, ultimately, *tasks will be divided based on efficiency.* In the long run, humans are unable to retain control of tasks where machines excel, even when the former would like to [33]. These two considerations—that (a) creative capabilities may not be enough for humans to maintain their unique advantage relative to algorithms and that (b) the regression of task division to the most efficient option in the long run—imply that both ignoring and resisting automation would be futile strategies. Apart from forming coalitions to

exert collective influence [59], advertisers have little effective means to affect ad platforms' feature development agenda.

Ultimately, advertisers need to navigate the environment provided by the ad platform and the wider institutional framework. One approach is to focus on the positive sources of value from automation—such as amplifying the impact of advertisers' decisions and reallocating time previously spent on routine tasks to analysis and strategic decision making. Another approach is to concentrate on areas of the advertising process where a human can add value, for example, campaign configuration, supervision, and structural changes, as opposed to micro-level optimization.

Feature changes in the dominant ad platforms have a striking impact on the exchange mechanisms within the entire industry—to the extent that market practices are shaped around the dominant platforms. A practical example is the education of marketing students using Google Ads [29], through which students become immersed in Google's advertising ecosystem early in their careers. This process of indoctrination shapes how young professionals perceive online advertising and their own agency within the ecosystem. For instance, the metrics Google chooses to include in its platform become targets for optimization, even though these metrics may not perfectly align with the advertiser's interests [47]. This is the case of *customer lifetime value*, a vital marketing metric [7; 74] that is unavailable in Google's ad platform and, therefore, advertisers dependent on Google's ecosystem may ignore this metric when making decisions.

AI-enabled advertising can, paradoxically, also be viewed as dumbing down of advertising for humans—more automation means human expertise is no longer needed to run the campaigns to the same extent as previously. This means that human advertisers need to find new sources of value to remain relevant and necessary in the online ad ecosystem. Such sources of value need to complement automated systems rather than compete with them. In other words, advertisers should adapt and shift their mindsets

during this transformational period, viewing digital advertising as a collaborative effort between humans and machines rather than as a source of competition.

Implications for Ad Platforms

Ad platforms are encouraged to consider advertisers' perceptions of fair treatment when designing new features and changing existing ones. When changes are unilateral and implemented automatically without the consent of advertisers, advertisers may perceive them as invasive[9]. In contrast, advertisers feel more secure about long-term investments in the ad platform when the relationship is built on dialogue and trust [45]. Although advertisers and platforms may be viewed as adversaries in online advertising, this is not always the case. Ultimately, both parties desire the same: a flourishing online ads marketplace. Thus, it is extremely important to ensure the quality of the ad market. In the case of Google, the ad auction mechanism itself has a built-in mechanism—"Quality Score" [31]—that rewards higher quality advertisers with lower click prices. The success of this form of quality-enhancing market mechanism [73] could encourage Google to increase automated features in its ad platform.

To this end, we suggest some design principles for the fair treatment of advertisers that concerns human agency:

- **Engage in dialogue about changes in the ad platform**—ask for advertisers' feedback before, during, and after the implementation.
- **Make accepting changes optional when they affect the agency of advertisers**—this is to alleviate advertisers' feelings of coercion into accepting a change that disrupts their established work routines.

[9] "Google's Auto Applied Recommendations catch advertisers, agencies off guard" – November, 2020: https://searchengineland.com/googles-auto-applied-recommendations-catch-advertisers-agencies-off-guard-343867

- **Grant independence for conducting own experiments to compare the performance of different features**—some advertisers might want to corroborate the effectiveness of the changes with their own data.
- **Help make more informed decisions**—give advertisers access to relevant metrics and accurate data across different campaign management tasks.

An example of a new feature that uses automation while giving more agency for planning and being optional is the addition of dynamic callout extensions in 2015. Advertisers now had the option of continuing to use manually created callout extensions or allowing Google to infer callout extensions from website content. When features are made optional, advertisers can experiment and make informed decisions based on their own conclusions. A feature change becomes problematic when its adoption is not optional—i.e., advertisers are denied the chance to continue their previous work practices. Therefore, *optional automation* could be considered as a design guideline for fair platform development.

Overall, dominant online ad platforms may be tempted by a vision of a *perfect market*, in which human advertisers' fallibility is eliminated using algorithms and big data. This vision, however, is hampered by the fact that algorithms make mistakes, too [76]. Another limiting factor is that changes removing access to data[10] or specific metrics[11] signify a step backward from data availability to data scarcity, at least for advertisers. This highlights fragility in the digital advertising ecosystem governed by ad platforms, in that data useful for human advertisers' decision making can be taken away or hidden behind the scenes by a platform that does not pursue transparency.

[10] https://searchengineland.com/googles-search-terms-move-will-make-millions-in-ad-spend-invisible-to-advertisers-340182 (June 2020)
[11] https://searchengineland.com/how-google-ads-impact-bids-pricing-adwords-auctions-269153 (February 2019)

Limitations and Suggestions for Future Research

Our study has some limitations. First, our analysis relies on trade news articles. Other sources of information, for example, legal documents related to the antitrust investigation against Google by the EU [60], could offer further insights into the area. *We suggest future investigations based on these various sources of data.* Also, Google Ads' functionalities somewhat vary by country or market region, which can make some of the findings not applicable to a specific market. While Google Ads generally operates in a homogeneous fashion, so that most features and functionalities are identical in different locations, cultural and geographic factors might play a role in how computational advertising attitudes are formed.

Second, changes in online ad platforms also have implications for consumers. For example, some of the changes that decrease advertisers' agency *increase* consumers' agency, such as their ability to maintain privacy[12]. Therefore, a follow-up study could investigate how changes in ad platforms affect consumers' agency. We could, in this regard, classify the platform change into different types and study how consumers' reactions differ. Third, there may be many reasons behind why Google makes changes in its ad platform. Ultimately, this analysis only reports an *external* view of the changes, without including Google's view of things. Hence, involving decision makers from Google would afford a multi-sided perspective on balancing human agency and engineering requirements.

Fourth, we focused on Google's industry leading platform, so other platforms, such as Twitter, Snapchat, and Facebook Ads, and other methods of advertising [10] could be investigated to establish a broader picture of changes taking place in the online ad industry. Fifth, our analysis is limited by what is publicly known about the changes taking place in Google Ads—hidden changes in Google's ad algorithms is an issue, as not all changes are made public due to strategic reasons. Future research could focus on mechanisms for alleviating this information asymmetry while connecting it to the notion of trust

[12] Google to prohibit demographic, zip code targeting for housing, employment, credit ads" – June, 2020: https://marketingland.com/google-to-prohibit-demographic-zip-code-targeting-for-housing-employment-credit-ads-279901

in electronic marketplaces [80], e.g., by deploying third-party auditors to fully understand the effects of opaque algorithms in online advertising.

Sixth, other forms of agency relationships in online advertising should also be explored, such as the middleman effect of the ad platform cutting off intermediaries (e.g., digital ad agencies) and human-computer interaction in computational advertising. Such studies can yield a broader view of human agency issues, especially since the continuing removal of intermediaries is likely to have a pertinent structural effect on the e-commerce landscape. On the other hand, new intermediaries and business models might be born out of the new features that Google adds. For example, it is possible for a single freelancer advertiser to manage dozens of ad accounts single-handedly, which has a clear connection to the *gig economy* [78] and *digital nomadism* [1], two important social changes influencing the knowledge work among advertisers.

Finally, while our findings revealed that advertisers' attitudes about human agency, automation, and Google's role vary, we were not able to explain where these differences stem from. Conceptually, we refer to *human agency preference* that encompasses the valence of attitudes pertaining to the hybrid work inputs by humans and algorithms in computational advertising. Future research should explore this concept further, in an attempt to establish how it is connected to other variables such as advertisers' satisfaction of using different ad platforms, technical aptitude, as well as performance- and control-orientation. For example, the observed shepherd type would not care about human agency *per se*, as long as the campaign performance remains satisfactory (to ensure it does, he needs to supervise the algorithm). The paradox of human agency is that while most advertisers rate the need for human agency very high; they tend to prioritize ad performance (which does not necessarily require human agency).

CONCLUSION

Our study emphasizes the importance of human agency in the face of evolving online advertising platforms. From targeting to ad creation, central advertising activities either have been or are becoming automated within the online ad platforms, which involves both pros and cons from advertisers' point of view. Advertisers generally want control over various aspects of campaign management, but at the same time, they are willing to enjoy performance improvements that can be attributed to automation and algorithmic decision making. This dualism necessitates further academic research and discussion regarding the role of human agency in the contemporary shift of the advertising landscape.

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TABLES

Table 1: News articles indicating impact on the advertisers' agency.

	Negative Impact	Percentage	Positive Impact	Percentage	No Impact	Percentage	Total
2015	4	6.6%	51	83.6%	6	9.8%	61
2016	11	12.8%	66	76.7%	9	10.5%	86
2017	18	27.3%	41	62.1%	7	10.6%	66
2018	21	32.3%	29	44.6%	15	23.1%	65
2019	8	17.0%	31	66.0%	8	17.0%	47
2020	13	35.1%	12	32.4%	12	32.4%	37
Total	**75**	**20.7%**	**230**	**63.5%**	**57**	**15.7%**	**362**

Table 2: The use of expansive and contractive terms in the news articles. The frequencies indicate how many news articles used the term at least once.

Expansive term	Frequency of articles mentioning the term (%)	Contractive term	Frequency of articles mentioning the term (%)
rolling out	94 (26.0%)	removing	13 (3.6%)
adding	54 (14.9%)	limiting	11 (3.0%)
adds	48 (13.3%)	limits	8 (2.2%)
launches	33 (9.1%)	retiring	10 (2.8%)
introducing	25 (6.9%)	removes	7 (1.9%)
rolls out	25 (6.9%)	sunsetting	7 (1.9%)
launching	21 (5.8%)	drops	2 (0.6%)
enables	20 (5.5%)	sunsets	1 (0.3%)
introduces	12 (3.3%)	dropping	1 (0.3%)
enabling	12 (3.3%)	disabling	1 (0.3%)
		retires	0 (0.0%)
		disables	0 (0.0%)

Table 3: Examples of how Google's changes impact advertisers' agency.

	Title of News Article	Description
	Decreasing agency	
A	Ability To Share Ads Via AdWords Shared Library Is Going Away	AdWords is retiring the ability to share ads via shared libraries. **January 2015**.
B	AdWords Changes The Definition Of	AdWords changes the conversions and reporting

	Title of News Article	Description
	Decreasing agency	
	Conversions For Reporting & Columns	columns to only include optimized conversion actions. **September 2015**.
C	Google+ Follower Counts In Search Ads Sunset	Google removes ad extensions in AdWords text ads. **December 2015**.
	Increasing agency	
D	AdWords Dimensions Tab Now Features Both Ad Group & Campaign Detail Reports	AdWords now offers reports for ad group and campaign details. **May 2015**.
E	AdWords Adds Bulk Uploads For Shopping Campaigns	AdWords rolls out bulk uploads for shopping campaigns. **August 2015**.
F	Google Expands Commission-Based Hotel Ads Program	Google expands hotel ad programs to desktop in the US. **September 2015**.
G	Google Adds Reporting Features For AdWords Flexible Bid Strategies	AdWords adds reporting features for flexible bid strategies. **December 2015**.

Table 4: Examples of how Google's changes impact advertisers' agency

	Title of News Article	Description
	Decreasing agency	
A	Sorry, No Emoji Allowed In Google PLAs (Frown Face)	Emojis are no longer allowed in product listing ads. **February 2016**.
B	AdWords now applies recommended bids to new DSA categories automatically	AdWords adds recommended automatic bids for dynamic search ad categories. **March 2016**.
C	Google sunsetting AdWords Converted Clicks in September	Google retires converted clicks as a tracking method. **July 2016**.
D	Google's ban on payday & high-interest loan ads going into effect now	Google bans payday and high-interest loan ads. **July 2016**.
E	Google officially throttling Keyword Planner data for low spending AdWords accounts	Google officially removes keyword planner data for accounts with low spending. **August 2016**.
F	Google restricts TrueView video ad rotation settings to "Optimize for views" only	Advertisers can no longer optimize for rotations or rotate evenly. All campaigns will be automatically changed to the new setting. Particularly impacts video campaigns that generate conversions and users running A/B tests. **December 2016**.
	Increasing agency	
G	AdWords Automated Bidding Gets An Overhaul: Welcome,	AdWords revamps automated bidding to add flexible strategies and conversion optimizers. **February 2016**.

	Title of News Article	Description
	Portfolio Bid Strategies	
H	Google is completely redesigning AdWords: Offers first peek	Google redesigns AdWords for better navigation and use (for the first time since 2018). **March 2016**.
I	Google opens Customer Match to Shopping Campaigns	Google allows advertisers to retarget customers with shopping product listing ads. **June 2016**.
J	Google expanded text ads are live, and device bidding & responsive ads for native roll out	Google replaces standard text ads with expanded and responsive ones. **July 2016**.
K	Google extends Drafts and Experiments to Display Network campaigns	Google rolls out new features for Drafts & Experiments. **August 2016**.
L	Google adds forecasting and trend data for existing keywords in Keyword Planner	Google adds a new tool to see bid scaling's impact on selected keywords. **October 2016**.

Table 5: Examples of how Google's changes impact advertisers' agency.

	Title of News Article	Description
	Decreasing agency	
A	Google to further dilute exact match in AdWords; will ignore word order & function words	Google adds the word-order and function-words to close variants for each match. Exact match keywords can trigger queries with different word order and function words. **March 2017**.
B	Google gradually limiting search ads on addiction treatment queries	Google limits search ads on addiction treatments. **September 2017**.
C	AdWords ad rotation settings to get trimmed: Optimize or don't	Google implements an automatic ad rotation setting for AdWords. **August 2017**.
D	Google is shrinking AdWords' view-through conversion window default	Google is shrinking the window for view-through conversions from 30 days to one (because ad views are more likely to lead to a purchase within one day). **March 2017**.
	Increasing agency	
E	Customizable, collaborative dashboards to arrive within AdWords	Google adds dashboards to slice and share data in AdWords. **September 2017**.
F	AdWords adds 'Days to Conversion' segmentation for sales cycle insights	Google adds segmentation to check conversion times after clicks. **October 2017**.
G	Google beefs up mobile shopping results for the holidays, adds more	Google improves mobile shopping experiences and releases search queries trends for Black Friday and Cyber Monday.

	Title of News Article	Description
	product info & buying guides	**November 2017**.
H	Google's new custom intent audiences and you	An analysis about new customer audiences and how to use them. **December 2017**.

Table 6: Examples of how Google's changes impact advertisers' agency.

	Title of News Article	Description
	Decreasing agency	
A	YouTube sets stricter rules on videos that can carry ads	Google sets stricter rules for videos with ads over safety concerns. **January 2018**.
B	Google removes addiction treatment ads from UK search results	Google removes ads about addiction treatment for the UK. **January 2018**.
C	Google axes political ads in Washington state, LinkedIn does it globally	Google bans political ads in Washington in response to a new finance law. **June 2018**.
D	Google to yank advertisers' option to exclude all mobile apps from display campaigns	Advertisers can no longer choose to not display ads on all apps. **August 2018**.
	Increasing agency	
E	Now you can make edits to keywords, ads, campaigns, bids right from the Google Ads Overview page	Google allows edits to keywords, ads, campaigns and bids from the Google Ads overview page. **August 2018**.
F	Google now shows dynamic search ad performance aggregated by landing page	Google adds dynamic ad performance aggregated by landing page (interface). **September 2018**.
G	Google debuts Shoppable Image ads, video in Shopping Showcase ads	Google introduces new shoppable image ads and video showcase ads. **September 2018**.
H	4 new search metrics in Google Ads to give you what you really wanted out of average position	Google rolls out new search metrics for auction results. **November 2018**.

Table 7: Examples of how Google's changes impact advertisers' agency.

	Title of News Article	Description
	Decreasing agency	
A	Google sunsetting two bidding strategies in June	Google retires Target Search Page Location and Target Outranking Share automated bidding. They are replaced by Target Impression Share, a portfolio of automated bidding strategies. **May 2019**.
B	You might start seeing Google Ads' automated recommendations in more	Automated recommendations now show in more places. **May 2019**.

	Title of News Article	Description
	places	
C	Google extends same-meaning close variants to phrase match, broad match modifiers	Google extends same-meaning close variants to phrase match and broad match modifier, and changes its preferences to prevent keywords from competing against each other. **July 2019**.
D	Google Ads portfolio bid strategy changes: Removing eCPC, average daily budget replacing target spend	Google changes the bid strategy to automatically work with average daily budgets of campaigns. **June 2019**.
	Increasing agency	
E	Google Ads rolling out Budget Planner forecasting tool	Google Ads rolls out a budget planning tool for campaigns. Users can create budget plans based on clicks or conversions. **March 2019**.
F	Google Ads unveils several fine-tuning controls for bidding strategies	Google unveils several new controls such as conversions at campaign level (manual), seasonality adjustments (manual) and new smart bidding strategies (automated). **May 2019**.
G	Location targeting available in Google Smart Shopping campaigns	Google is automatically optimizing machine learning-driven campaigns for products ads. Before, campaigns targeted all countries and territories. Now, they can be narrowed and set radiuses. **October 2019**.
H	Google extends optimization score to Display campaigns	Google adds optimization scores for Display and Shopping campaigns. **December 2019**.

Table 8: Examples of how Google's changes impact advertisers' agency.

	Title of News Article	Description
	Decreasing agency	
A	Google introduces Smart Campaigns for small businesses — the first new solution to launch under the Google Ads brand	Google launches Smart Campaigns, which are designed for small and local businesses that do not have dedicated marketing staff. They become the Default now for new users. The campaigns are almost entirely automated. **June 2020**.
B	Google to prohibit demographic, zip code targeting for housing, employment, credit ads	Employment, housing, and credit advertisers are no longer permitted to target or exclude their ads from being shown based on demographics. **June 2020**.
C	Google's search terms move will make millions in ad spend invisible to advertisers	Google limits reports to terms that only include searches by a significant number of users - supposedly to maintain privacy. "For every $100K you spend on Google search, you get search term data for $71,000 of it." **July 2020**.
D	What's changed in Google Ads Locations reporting and why you	Google rolls out simplified location reports and consolidates two reports into one. Functionality is similar but more difficult to access

	Title of News Article	Description
	need a custom report	than before. **October 2020**.
E	Google's Auto Applied Recommendations catch advertisers, agencies off guard	A program implemented in 2019 by Google caused unexpected changes to keywords that don't show in Change History. **November 2020**.
	Increasing agency	
F	Google Ads enables bid simulator for Target ROAS, budget simulator for Maximize clicks, conversions	Google extends the availability of bid and budget simulators to more "smart bidding" strategies. **January 2020**.
G	In major shift, Google Shopping opens up to free product listings	Google makes Shopping results listings free. Merchants who want more prominence will still have to pay. Increased agency because there are more channels to advertise. **April 2020**.
H	New Google 'Rising Retail Categories' tool exposes fast-growing product searches	Google offers a tool that provides advertisers with more insight into fluctuations in consumer demand (US, UK, and Australia). This increases agency by providing more information. **May 2020**.
I	Google extends lead forms to YouTube, Discovery campaigns	Google includes several extensions for collecting users' information and add questions to forms. They also automate offline data imports from CRM and Zapier—although this is an automation feature, it gives advertisers possibilities to link their Google campaigns with other systems. **July 2020**.

Table 9: The use of automation terms in the news articles. The frequencies indicate how many news articles used the term at least once.

Term	Frequency (n) of articles mentioning	Frequency (%) of articles mentioning
automatic	67	18.5%
automated	60	16.6%
machine learning	46	12.7%
automation	19	5.2%
feed	33	9.1%
artificial intelligence	4	1.1%
	229	63.20%

Table 10: The use of privacy terms in the news articles. The frequencies indicate how many news articles used the term at least once.

Term	Frequency (n) of articles mentioning	Frequency (%) of articles mentioning
privacy	13	3.6%
regulation	6	1.7%
protection	6	1.7%
GDPR	5	1.4%
CCPA	2	0.6%
legislation	1	0.3%

Term	Frequency (n) of articles mentioning	Frequency (%) of articles mentioning
consumer rights	0	0.0%
	33	9.30%

Table 11: Respondent information. We received 193 qualified responses of which 186 (96.4%) gave their demographic information.

Male	Female	Age (M, years)	Age (SD, years)
79	107	28.2	6.0
42.5 %	57.5 %		

Table 12: Respondents' nationalities. We received 193 qualified responses, of which 186 (96.4%) gave their demographic information.

Nationality	N	%
United States	36	19.4 %
South Africa	28	15.1 %
United Kingdom	27	14.5 %
Mexico	20	10.8 %
Poland	18	9.7 %
Other	57	30.6 %

Table 13: Variability of the responses. The values are sorted from highest to lowest. A higher value indicates more variability or disagreement about the statement.

Statement	CoV
I fear the possibility that algorithms and automation will replace my work as an online advertiser.	0.469
During my time working in online advertising, Google has decreased the choices available to me in Google Ads.	0.402
I feel Google is constantly taking away decision power from advertisers concerning how to run campaigns in Google Ads.	0.371
I generally appreciate Google Ads making decisions automatically on my behalf.	0.339
I generally prefer Google Ads giving me recommendations.	0.265

FIGURES

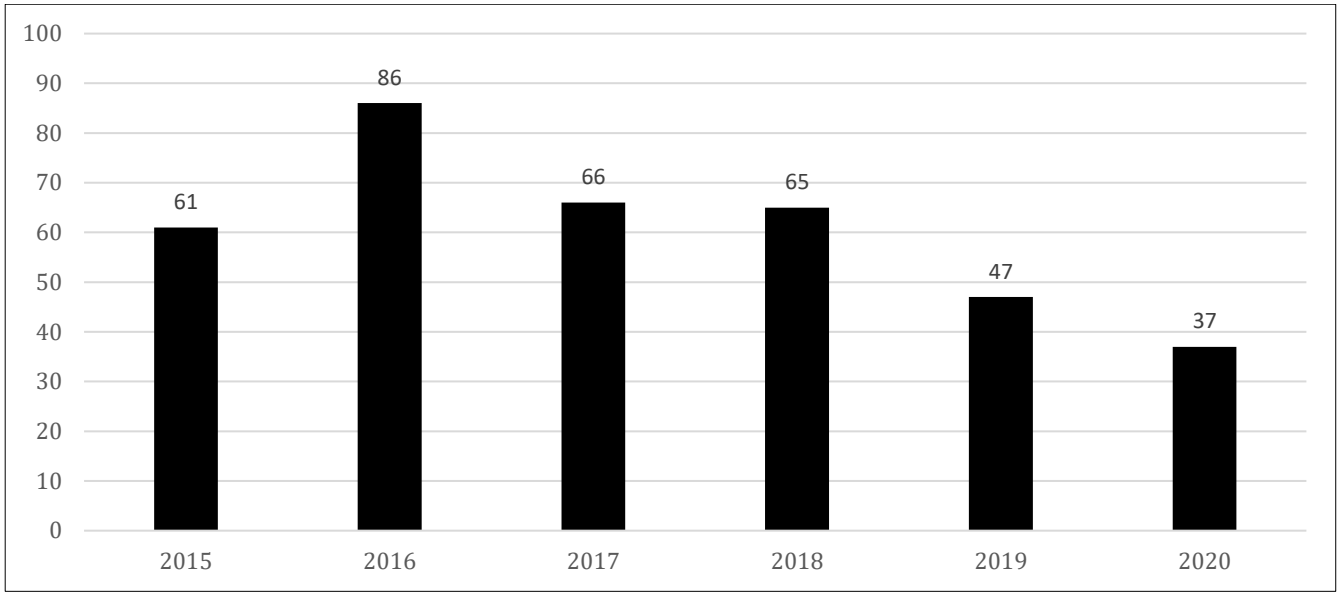

Figure 1: Number of analyzed news articles.

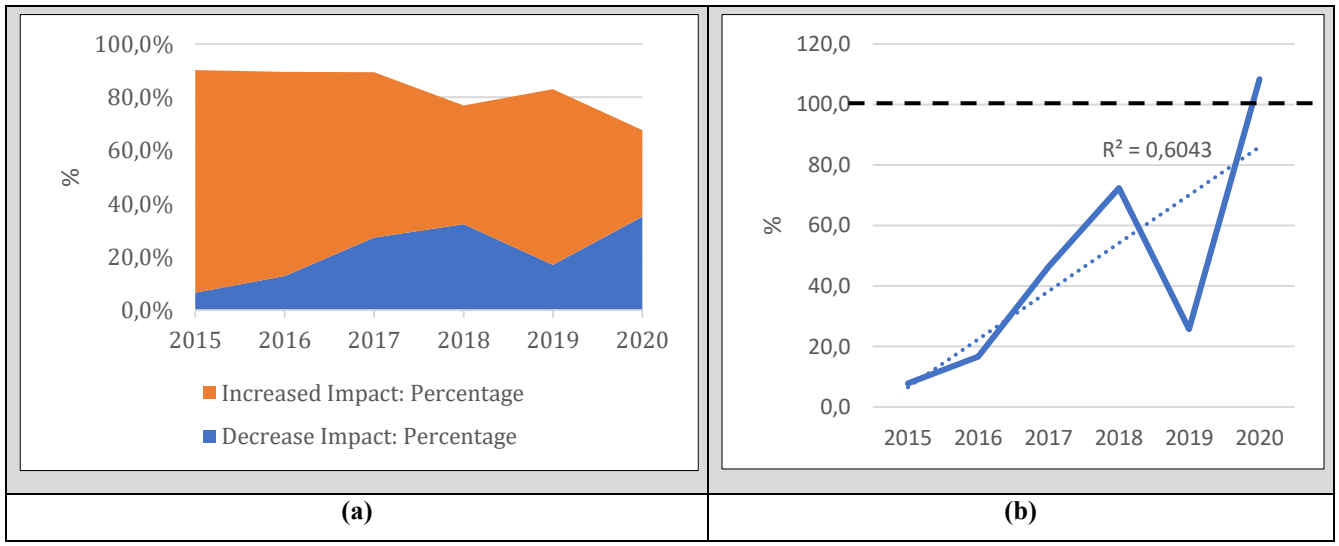

Figure 2: Change in advertisers' human agency in response to Google's changes: **(a)** shows the number of changes with increasing (orange area) and decreasing (blue area) impact. The increasing and decreasing approach each other over time, an effect that is also observed in **(b)** the ratio of *decreasing* changes to *increasing* changes. Year 2020 was the first time in the examination period where there were more decreasing than increasing changes.

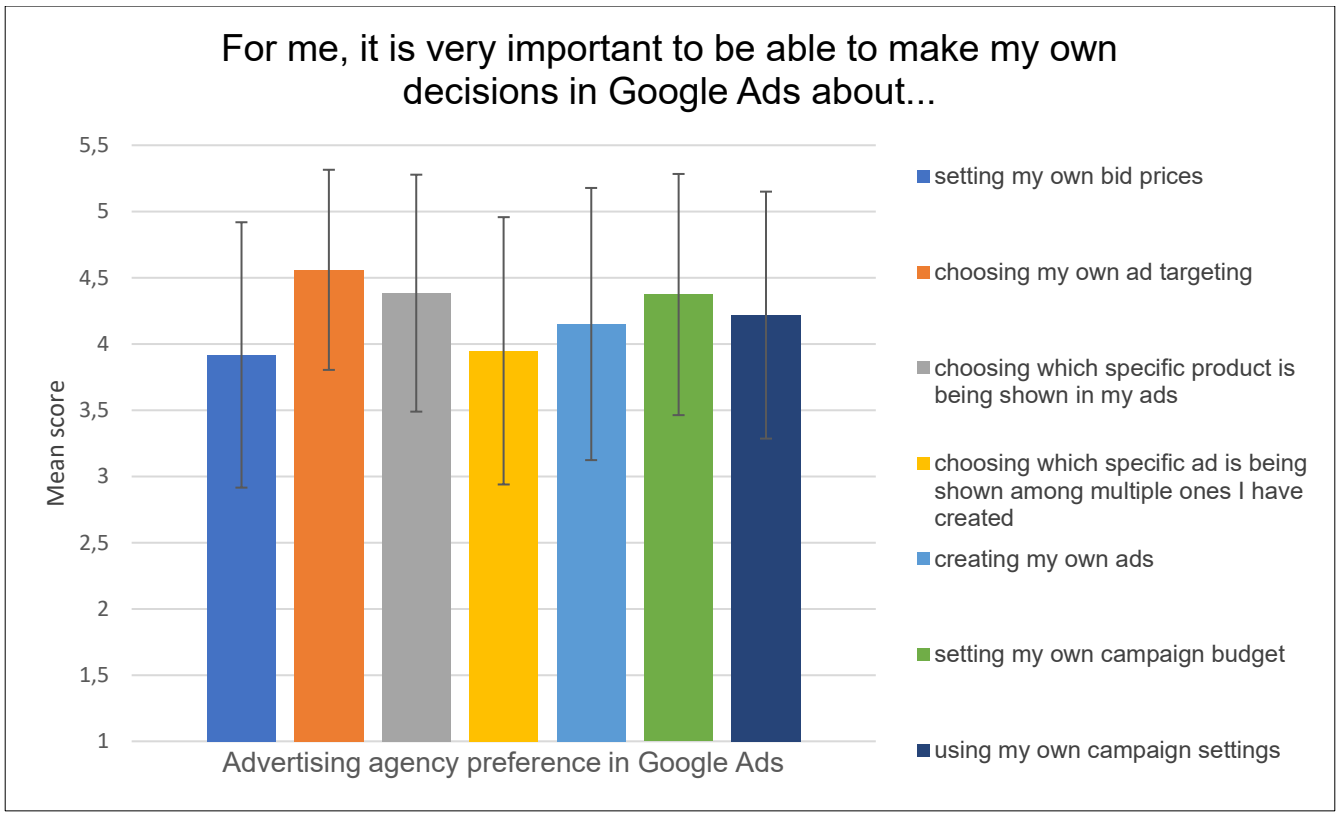

Figure 3: Facets of advertising agency preference in Google Ads. The error bars indicate standard deviations.

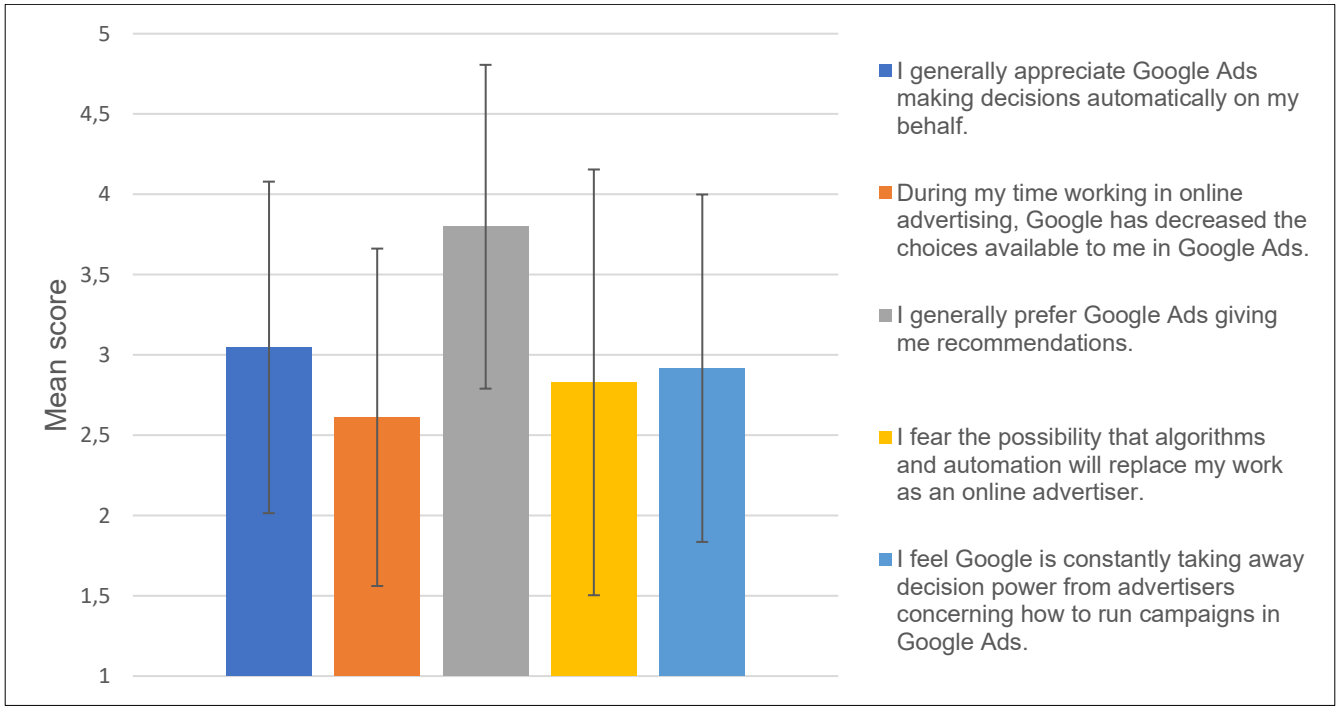

Figure 4: Online advertisers' attitudes towards automation.

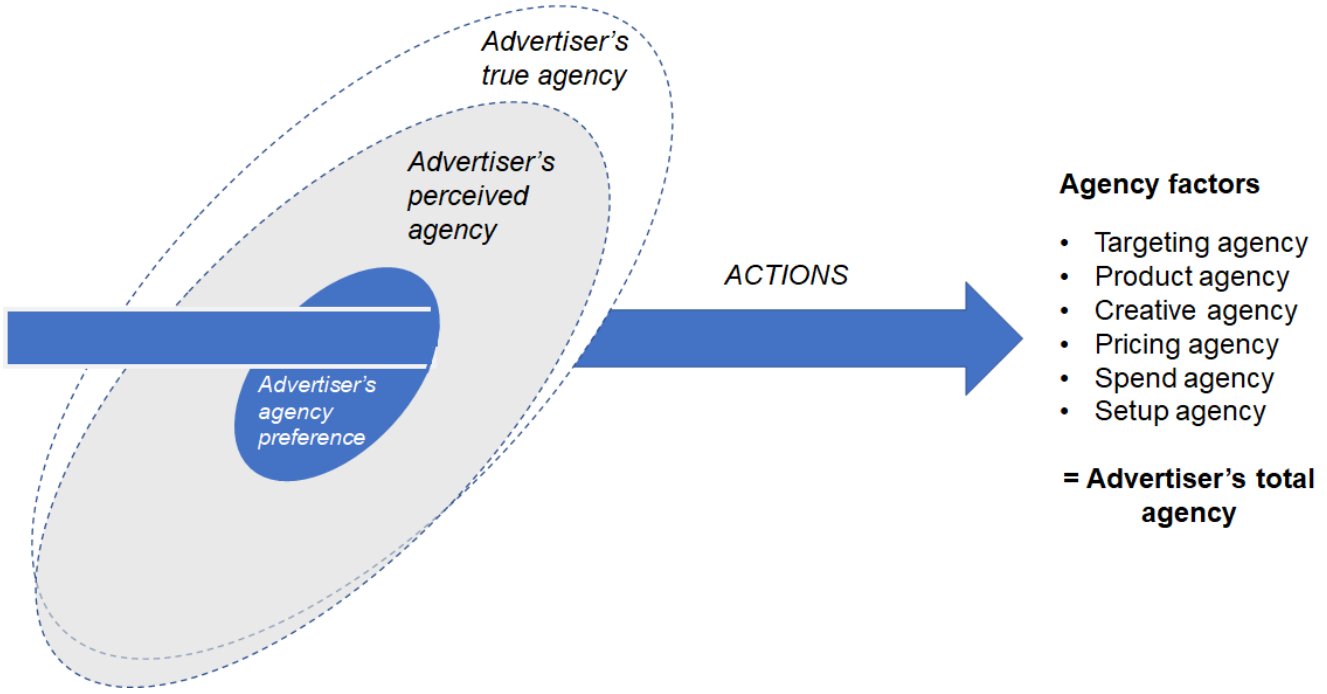

Figure 5: *The Online Advertising Human Agency Framework*. The framework consists of advertiser's human agency preferences, perceived human agency, and true human agency. These views of agency are based on several aspects that equate to the total human advertiser agency.

Control orientation / Performance orientation	High	Low
High	Tinkerer	Shepherd, Instrumentalist
Low	(Brand-focused)	(N/A)

Figure 6: Computational advertising attitude types. All types we observed emphasized performance orientation (i.e., the goal is to achieve quantitative goals), but the envisioned means to reaching the performance goals differ. Tinkerers believe the goals are best met by their own human efforts and

expertise (thus the high control dimension). In contrast, the control orientation is lower for shepherds and instrumentalists - their conceptual difference is that shepherds emphasize the need to supervise ad algorithms, whereas instrumentalists have more trusting beliefs about those algorithms. We also note that, although we did not observe this attitude type, it is possible that there are advertisers who wish to remain in control over advertising process include ad creation and targeting, while being less concerned about direct performance in terms of conversions. We refer to these as “brand-focused advertisers”.