

Research Article

Age and Gender Stereotypes Reflected in Google's "Autocomplete" Function: The Portrayal and Possible Spread of Societal Stereotypes

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Received: August 29, 2019; Editorial Decision Date: November 7, 2019

Decision Editor: Barbara J. Bowers, PhD

Abstract

Background and Objectives: Google's autocomplete function provides "predictors" to enable quick completion of intended search terms. The predictors reflect the search trends of a population; they capture societal beliefs and perceptions about a variety of subjects. This study explores the predictors provided by Google United States when searching for information about older men and women.

Research Design and Methods: The Google search engine of the United States was used to record predictors in response to 720 search terms. Inductive content analysis method was used to categorize and interpret the results.

Results: There was prevalence of age and gender stereotypes in the predictors offered by Google. Queries about older men were primarily associated with romance and sexuality whereas those for older women centered on changes in the body as well as sexual and reproductive health.

Discussion and Implications: The appearance of such predictors in response to a potential search query may lead to the spread of harmful stereotypes about older adults.

Key words: Agism, Sexism, Incidental learning, Media

A fairly large proportion of an individual's learning occurs from the consumption of various forms of media (Zukin & Snyder, 1984). Whereas some learning experiences may be intentional and require active involvement, such as watching a documentary, others may be unintentional and passive, requiring neither interest nor motive, such as learning about new products and services through television or billboard advertisements (Zukin & Snyder, 1984). The process of unconscious, unplanned absorption of contextual information about a topic is termed "incidental learning" or "natural learning" that people "pick up" without meaning to (Stanton, 1971). Incidental learning is usually a byproduct of planned and intentional learning in different environments/contexts, such as schools, work-

places, hospitals, museums, and life events, to name a few. It is a continuous, on-going process even when people are unaware of such learning taking place (Marsick & Watkins, 2001). Incidental learning generally occurs "by chance." Hence, it is also called "random learning" (United Nations Educational, Scientific and Cultural Organisation, 2019).

Today, one of the most widely used forms of media is the information gathering and generation tool—the Google search engine (Clement, 2019). Google processes billions of search requests per day. An important function of the search engine is to provide "predictors," similar to prompts, to automatically complete a search term that a user begins to type. The goal of this autocomplete function is to help people to complete a phrase or a sentence that they were intending to type, thereby

reducing typing time by almost 25%. The predictors capture the most commonly searched information about a topic by a population; they are based on one's location, previous searches, current trends, and common searches (Sullivan, 2018).

As Google's autocomplete algorithms are based on real-world search activities, they are influenced by searches carried out by a population at different times, during specific events (such as the worldwide Women's March or the FIFA World Cup), in different languages, and in different countries. Consequently, Google autocomplete serves as a reflection of societal beliefs and perceptions about a variety of subjects; it captures people's interests and queries about a range of topics (Sullivan, 2018).

Although the predictors are meant to help people save time, the various options or possibilities generated by the autocomplete function may inadvertently influence an individual's thought process, knowledge, or curiosity surrounding certain topics. For example, typing "New York" in the Google search bar may yield a range of predictors, such as "Yankees," "Times," "weather," "MET," and "Post," even though the user's initial interest may have been to learn about the city's subway system or Central Park. Exposure to these various predictors, however, may compel the user to consciously or unconsciously register five different aspects related to New York that may not be relevant to their current interest. Subsequently, they may use the information to digress from their current search to explore one or all of these predictors further; they may store the information for a future search; they may retain the information without feeling the need to explore further; or they may ignore the information altogether. In all four instances, however, the user is likely to be influenced by the information in the short- or long-run. Over time, such unsolicited information, even though irrelevant to current needs and interests, may impact a user's understanding and beliefs about different subjects (Zukin & Snyder, 1984).

This study uses the autocomplete function of Google United States to explore common queries that it handles about older men and women. Importantly, it rests upon the layperson's perception and interaction with the Google autocomplete function. An overview of this information is important for two primary reasons: (a) an understanding of what people are thinking or wish to know about older adults can help stakeholders, such as policy-makers, who shape public opinion and influence narratives surrounding old age. Such stakeholders might use this information to create information materials, awareness programs, or policies that address the information gap identified by this study; and (b) an examination of these could add a new dimension to the existing literature on the potentially far-reaching role of the media in the promotion and perpetuation of age and gender stereotypes.

Age Stereotypes

Decades of research have explored societal perceptions of older adults. Rowe and Kahn (1998) list six common myths associated with aging: (a) old age means sickness,

(b) old people cannot learn new things, (c) it is too late for old people to adopt healthy lifestyles, (d) genes are responsible for how an individual's old age plays out, (e) old people have low sex drive and lower ability to perform sexually, and (f) old people are dependent on society. The media portrays older adults in stereotypical fashion as well: from underrepresentation and marginalization of older characters in cinema, primetime television, and magazine advertisements (Raman, Harwood, Weis, Anderson, & Miller, 2008; Robinson, Callister, & Magoffin, 2009; Signorielli, 2004) to negative characters such as villains and witches in Disney films (Robinson, Callister, Magoffin, & Moore, 2007; Robinson et al., 2009) to customers of cosmetic and anti-aging products and services (Smirnova, 2012). Social media platforms, such as Facebook groups, have also been found to be overwhelmingly negative in their portrayal of older adults (B. R. Levy, Chung, Bedford, & Navrazhina, 2014).

Common negative stereotypes include older adults being frail, weak, wrinkled, slow, nagging, grumpy, useless, disabled, lonely, senile, a threat to society, and so on (Palmore, 1999; Robinson et al., 2009). Positive stereotypes, on the other hand, imbue older persons with kindness, wisdom, political clout, wealth, dependability, freedom, eternal youth, and happiness (Palmore, 1999). Whereas age stereotypes held by individuals or groups have the capacity to permeate social structures such as bureaucracy or public institutions and affect legislations, policies, and scientific research impacting older people (Angus & Reeve, 2006), internalized age stereotypes or stereotype embodiment—both positive and negative—can have far-reaching effects on older adults' own well-being, functioning, health, and longevity (Allen, 2016; B. Levy, 2009; B. Levy, Ashman, & Dror, 2000). Age stereotypes, therefore, positive and negative, internal and external, greatly influence societal perceptions surrounding older adults.

Gender Stereotypes

In addition to being age stereotyped, older adults may be further stereotyped based on gender. Whereas most older adults experience some form of devaluation as they age, women bear a heavier burden of age and gender stereotyping as they live longer than men, and therefore, experience losses greater in number and intensity than their male counterparts (Barrett & von Rohr, 2008). In addition to experiencing major life changes, such as widowhood, poverty, institutionalization, and disability, women also lose their social asset—their physical attractiveness—as they age (Barrett & von Rohr, 2008; Sontag, 2018). Researchers have argued that women, for almost the entirety of their lives, are judged by their appearance and their ability to attract and retain the male gaze. The aging process in women is construed as a moral failure, a gradual loss of femininity, and "sexual disqualification"; a woman's sustained sexual desire and interest as she ages is deemed inappropriate (Smirnova, 2012; Sontag, 2018).

Older women are also associated with prototypes such as the “wicked old witch,” “old bad mother,” and “little old lady” to symbolize unnatural powers, neuroticism, neediness, and powerlessness (Copper, 1990 in Cruikshank, 2013). They are further viewed as old hags, shrews, and crones; frumpy, sexless, bitter, mean, complaining, eccentric, and numerous other such unflattering, demeaning, humiliating, and insulting stereotypes (Cruikshank, 2013). In fact, so burdensome is the experience of aging for a woman, that Copper (1990) mentioned the festering of a “primal loathing” reserved for older women just for existing (in Cruikshank, 2013).

Similar to women, older men are also subjected to age bias and devaluation as they age. However, being an older man is not fraught with the same complexities associated with being an older woman. Unlike women, who are believed to lose their valuable social asset of physical attractiveness as they age, men are considered to gain social resources such as higher earning potential and public achievement as they grow older (Sontag, 2018). And although older men may be typecast as “old fart,” “dirty old man,” “geezer,” “grumpy old man” and similar stereotypes, there exists no equivalent of “primal loathing” directed especially toward older men in society (Cruikshank, 2013).

The comparatively lower amounts of pressure on men to maintain youth and beauty is evident in the anti-aging industry’s efforts to inundate women with products, procedures, and devices to slow/arrest/reverse the aging process. Men have largely been spared the intense scrutiny, pressure, and negative reactions of “blame, shame, and moral failure” for “letting themselves go” and not pursuing available options to be their “best self” (Smirnova, 2012). In recent decades, however, men have increasingly been targeted by the anti-aging industry and by the pharmaceutical industries to maintain active sex lives. Importantly, the focus of the messaging for men is different from those used to market such products to women. Whereas women are mostly promised youthful skin and younger bodies designed to transform them into models that will attract men, men are lured by promises of increased energy, libido, sexual potency, endurance, strength, force, and competitiveness to enable peak performance in their private (“bedroom”) as well as professional (“boardroom”) lives (Calasanti, 2007).

The aging male body and sexual function are increasingly medicalized (as opposed to the acceptance of decline in body and sexual function with age); masculinity is equated with power; and older men are encouraged to “play hard” (through consumption of expensive leisure and travel activities) and “stay hard” (with medical product-enabled sexual functioning) if they wish to reclaim their masculinity (Calasanti & King, 2005; Marshall, 2006). The promise that the aging male body can be “forever functional” has led to the rapid growth of the Viagra industry, pharmaceutical/sex hormone therapies and various health and lifestyle measures aimed at rejuvenating and restoring vigor, vitality, and virility in the aging male (Marshall, 2006, 2009).

The Present Study

It is in the context of this juxtaposition of age and gender stereotypes that this study aims to explore what Google users in the United States want to know about older men and women, through the predictors that they receive from the autocomplete function employed by the search engine. As perceptions about older men and women are primarily driven by generalizations arising from limited interactions with older adults, lack of information/misinformation about older adults, and stereotypical representations by the media (Robinson & Anderson, 2006; Russell, 2007; Sedick & Roos, 2011), this study seeks to understand how Google fulfills the role of information provider for those who use the search engine to explore information about the older population. Importantly, in addition to providing information, Google autocomplete may also play a powerful role in the portrayal and subsequent spread of age and gender stereotypes. Therefore, it is important to examine Google’s current autocomplete trends.

The autocomplete function is, among other factors, at least partially influenced by past searches. Hence, it captures relevant societal discourse about various topics, such as the intersection of age and gender. In keeping with past research findings about societal perceptions surrounding older adults, we expected queries about older women to primarily revolve around their appearance, body image, make-up/clothing, and decline in sexual appeal. For older men, we expected references related to sexual functioning. For both genders, we expected the results to touch upon stereotypes such as “little old lady” or “grumpy old man.”

Design and Methods

Data Collection

This study was conducted using the Google United States website in the months of January–March 2019. Data collection was undertaken using a combination of search terms that included six question words: “what,” “why,” “when,” “where,” “who,” and “how.” These were combined with “is an,” “are,” “does an,” and “do.” They were further combined with “old,” “older,” and “elderly.” Finally, gender was added using “woman,” “woman’s,” “women,” “women’s,” “lady,” “lady’s,” “ladies,” and “ladies” for females; and “man,” “man’s,” “men,” “men’s,” “gentleman,” “gentleman’s,” “gentlemen,” and “gentlemen’s” for males. The researchers had initially commenced the data collection process for men using only the terms mentioned above. However, as the search process progressed, Google autocomplete began to display “similar results” that used the term “guys” in place of the original terms. Therefore, to include all possible data, the search for older males was undertaken a second time with the inclusion of the terms “guy,” “guy’s,” “guys,” and “guys’.” Examples of final search terms are: “What does an older man. . .,” “Why are elderly women’s. . .,” “How do old gentlemen. . .,” and

“When is an older lady’s. . .” Eventually, a total of 720 search terms were used to collect data—288 for females and 432 for males (Supplementary Table 1).

The study had two selection criteria for data inclusion: First, only complete queries with clarity of message would be collected. Therefore, vague and unclear queries such as “Who do elderly ladies get paid?” or “Why do old gentlemen’s haircut barbershop” were not selected. Second, only queries that represented the general population would be included. Therefore, queries that referred to older adults/characters in literature, cinema, history, or politics, such as “Why does an elderly Lady Macbeth faint?” or “What is The Old Man and the Sea?” were excluded from the data collection process. Also of note is the fact that not every search term yielded results (or queries). For example, there was no result for “Where is an old lady’s. . .” or “How do elderly men’s. . .,” and a few other search terms.

The entire data collection process was conducted on one computer. Subsequently, 10 selected search terms (five each for men and women) were tested on eight different computers to see if and how results varied depending upon the users’ search history (Supplementary Table 2). All searches were conducted in the same geographical location, but computers belonged to people originating from North America, Europe, the Middle East, and the Far East.

Data Analysis

The data analysis process was driven by an inductive content analysis approach (Elo & Kyngas, 2008). Content analysis provides the means to describe and quantify phenomena through a systematic analysis of written, visual, or verbal communicative data. It is especially helpful in bridging the gap between qualitative and quantitative data analysis as it allows for the distillation and classification of words into fewer categories with the assumption that the contents listed under each category share the same meaning. Inductive content analysis allows the researcher to move from the specific to the general thereby enabling the creation of broad, general statements about a phenomenon. This method is particularly useful when there exists limited research on a topic (Elo & Kyngas, 2008).

In this study, all queries that met the selection criteria were extracted and compiled in an Excel file with separate pages for each of the six question words and corresponding gender. Each listed query was subsequently coded, and recurrent, similar queries were grouped into categories (Elo & Kyngas, 2008). Next, all duplicate queries were removed from the coded and categorized data set. For example, “How does an old man walk” and “How does an older gentleman walk” were treated as a single query and retained as such in the data set. At this stage, it was decided that if a category did not have more than one piece of datum, it would be filed under “general queries” and excluded from further analysis due to the difficulty in categorizing such data. Finally, the contents of each broad category were

counted to make comparisons between categories, and the data within and between categories were interpreted to gain a broad, holistic understanding of the results.

Trustworthiness

As mentioned earlier, the data collection process was undertaken on one computer to maintain consistency. However, the researchers wanted to test the variability of the content generated when the same search terms were typed into a browser that had a different search history. Consequently, eight other computers belonging to colleagues were used to run the search for 10 selected search terms that included both men and women. This process was undertaken in the same geographical location in early April 2019 (though the computers belonged to individuals who had previously resided in different geographic areas, as detailed above). It was found that irrespective of user history, more than 87% of autocomplete predictions offered by Google were the same across computers. The data for this study were coded and categorized by the first author. However, they were subsequently refined based on feedback from an international group of researchers.

Results

Six broad categories comprised the results for both genders. These included: (a) “relationship,” (b) “sex,” (c) “body,” (d) “health,” (e) “appearance,” and (f) “attire.” These categories captured the most common, recurrent, and repetitive questions about older men and women. Both genders also had a “general queries” category which covered a wider range of topics and included questions such as “What do older gentlemen drink?” or “What do old ladies carry in their purse?” This category included queries that did not meet our inclusion criteria of each category containing more than one piece of datum. Therefore, although interesting, this category was excluded from the primary results of the study for having too many fragmented subcategories to allow for a comprehensive understanding of larger overall trends.

A list of the categories for both genders, along with the number and percentage of queries pertaining to each, is presented in Table 1. The last column for each gender lists two examples for each category for illustrative purposes. For men, most queries were related to “relationship” (45.09%), followed by “body” (15.68%), “sex” (13.72%), “attire” (11.76%), “health” (7.84%), and finally, “appearance” (5.88%). For women, the largest number of queries surrounded “health” (31.25%), followed by “body” (23.43%), “relationship” (18.75%), “appearance” (15.62%), “sex” (7.81%), and “attire” (3.12%).

Although the headings of categories were the same for both men and women, the thrust of the messages varied between the genders and the six categories. For example, the first category, “relationship,” was made up of queries

Table 1. Categories of Queries^a Related to Older Men and Women, With Examples

Categories	Men			Women		
	No. of queries	% of queries	Examples	No. of queries	% of queries	Examples
Relationship	23	45.09	“How does an older gentleman flirt?” “What does an older man want in a relationship?”	12	18.75	“How does an older woman attract a younger man?” “Why are older ladies called cougars?”
Body	8	15.68	“Why do old men’s noses drip?” “Why do old men have big ears?”	15	23.43	“Why do old women’s breasts sag?” “Why do older women’s arms get flabby?”
Sex	7	13.72	“What does an older man want in bed?” “How does an elderly guy last long in bed?”	5	7.81	“What does an old lady taste like?” “When does an elderly woman reach climax?”
Attire	6	11.76	“Why do old guys wear white sneakers?” “Why do old guys wear Speedos?”	2	3.12	“How do old ladies dress?” “What does an older woman wear to a wedding?”
Health	4	7.84	“When does an elderly man stop producing sperm?” “How does an elderly guy get UTI?”	20	31.25	“When does an elderly woman go through menopause?” “Why does an elderly woman need protein?”
Appearance	3	5.88	“Why do old men’s pants fall down?” “How does an old man walk?”	10	15.62	“Why do older ladies grow facial hair?” “Why do old ladies have blue hair?”

^aQueries refers to the predictors generated by the autocomplete function of Google in response to the entered search terms.

related to romantic interest, flirtation, and primarily heterosexual relationship-oriented topics. It registered the highest number of queries for men (45.09%), and included content such as “What is an older man with a younger woman called?”, “What does an older man want from/look for in a woman/girl/relationship?”, “Why are older men into me/interested in me/attracted to me?”, “Why do old gentlemen prefer blondes?”, “When does an elderly man fall in love/start to miss you/come back?”, and “How do older guys show interest?” For women, this category recorded the third-highest number of queries (18.75%) and included only two main types of messages: (a) “What does an older woman see in/want from/look for in a man/younger man/younger guys?” and (b) “Why/when is an older woman called a ‘cougar?’” This category included a wider range of curiosities about men compared with women. Men were also portrayed as more active in their pursuance of romance and relationships whereas women were portrayed as passive objects.

The second category, “body,” included queries related to natural physical characteristics of older men and women. These pertain specifically to body structures or bodily changes related to advancing age. This category had the second-highest number of queries for both men (15.68%) and women (23.43%). For men, queries included, “Why are old men’s stomachs hard?”, “Why do old guys fart so much/have big ears?”, and “Why do old men’s hands shake/noses turn purple/stomachs stick out/noses drip?” For women, queries in this category included, “Why do old women’s stomachs get big/breasts sag/ankles swell/arms get flabby?”, “How does an older woman lose weight/belly fat?”, and “What does an elderly woman weigh/smell like?” As evidenced from the examples, most queries about

both older men and women tended to be negative in nature and focused on the loss of attractiveness. Moreover, some of these queries showed interests and curiosities that reflect distance and limited familiarity with older men and women.

The third category was termed “sex” due to the nature of the queries that primarily revolved around sexual preference, performance, and satisfaction. For men, this category recorded 13.72% queries. Some examples include: “How do older guys feel about virgins?”, “What does an older man want in bed?”, “Why are older guys better in bed?”, and “How does an elderly guy last long in bed/finger you/feel when he comes?” For women, the number of queries was fewer (7.81%) than those for men. They were also less explicit in nature. They included, “When does an elderly woman get turned on/come/reach climax?”, and “What do older women like in bed/ taste like?” Like the category “relationship,” this category also recorded greater numbers and range of queries for men compared with those for women. Also, similar to the category “relationship,” men were portrayed as more active in their sexual roles and preferences than were women.

The fourth category was called “attire.” This category had higher numbers of queries for men (11.76%) than women (3.12%) for whom it had the fewest queries of the six categories. For men, queries included, “What do older gentlemen wear/wear in the summer/wear at home” and “Why do old guys wear white sneakers/Speedos/New Balance.” For women, this category included, “How do old ladies dress” and “What does an older woman wear to a wedding?” This category only had questions about older men and women’s sartorial habits and preferences.

The fifth category, “health,” recorded some of the fewest queries for men (7.84%) and the highest (31.25%)

for women. This category included content related to reproductive capacities, sexual health, nutritional needs, and nonsexual infections/diseases. There were only two types of queries for men: “When does an elderly man stop producing sperm” and “How does an elderly guy get UTI/yeast infection?” For women, on the other hand, 50% of the queries were related to reproductive and sexual health: “When does an elderly woman ovulate/get pregnant/go through menopause/start producing milk/stop producing eggs/have periods?” Some queries were related to health issues such as, “How does an elderly woman get yeast infection/HPV/UTI?”, and others referred to nutritional needs such as, “Why does an elderly woman need iron/protein?” This category, like the category “body,” also focused on negative aspects of growing older, especially those related to the decline in reproductive capabilities.

The sixth, and final, category was termed “appearance.” It centers on queries related to how older men and women appear on the outside. Although this category includes some visible changes that take place in the body with age, most of the content in this category is related to aspects about physical appearance over which an individual is able to exercise control. Similar to the previous category “health,” this category recorded the lowest numbers of queries for men (5.88%) and a much higher number for women (15.62%). Queries for men included, “Why do old men’s pants fall down?”, “How does an older man walk?”, and “What are elderly gentlemen’s haircuts?” For women, queries ranged from “What does an elderly woman look like?” to “Why do older women have blue hair/purple hair/short hair/curly hair?”, “Why do old ladies get perms?”, “Why do older women’s hair thin out?”, “Why do older ladies grow facial hair?”, and “How are older ladies’ hair/make up?” The content within this category focused heavily on women’s appearance, especially with regard to their hairstyle preferences.

Although the data primarily recorded differences in the focus of the queries related to the two genders, there were a handful of similarities. For example, the category “sex,” for both men and women, included queries related to what they liked or wanted in bed. Similarly, the “health” category included queries about how older men and women get urinary tract infection (UTI) or yeast infection, and the category “attire” had queries about how older men and women dress. These examples displayed commonalities in people’s curiosities for which they turned to Google. However, these were the only areas that had overlapping queries for men and women. The rest of the data showed far more differences than similarities in the queries relating to the two genders even though the broad, overarching categories had similar headings. Importantly, the focus of the queries for the two genders differed greatly. Whereas most queries for men revolved around “relationship,” “body,” “sex,” and “attire,” in descending order, for women, queries centered on “health,” “body,” “relationship,” and “appearance.”

An important aspect of the overall findings of the study was that most queries seemed either neutral (neither

negative not positive) or negative in nature. For example, “What do old men wear?” may be considered a neutral query as it does not convey either positive or negative connotations. On the other hand, “Why do older women’s arms get flabby?” may seem negative considering prevalent societal discourse surrounding body weight issues, especially among women. Very few positive characteristics, such as “How do older gentlemen flirt?” were present in the data. Otherwise, there was very little that cast a pleasant or optimistic light on older men and women. Many queries related to loss, decline, or the end of biological functioning (“When does an elderly woman stop producing eggs?”), loss of physical capability/control (“Why do old men’s hands shake?”), or even a general lack of attention to one’s appearance (“Why do old men’s pants fall down?”). Finally, there were some vague and abstract queries, such as, “What does an old gentleman do?” or “What do old ladies say?” that have no easy or straightforward answers.

Discussion and Implications

This study was conceptualized as a way to delve into the minds of people when they have the freedom to ask questions in an anonymous setting. Google was chosen as the data collection tool as it is one of the primary search engines used around the world, especially in the United States (Clement, 2019). In addition to addressing people’s curiosities, however, Google may also play an important role in the spread of age and gender stereotypes via its autocomplete function.

The results of the study emphasize society’s preoccupation with older women’s bodies, biological functioning, and physical attractiveness, and older men’s interests with respect to romantic/sexual partners. This was evident not only from the largest number of queries related to “health” and “body” for women versus “relationship” for men, but also from the nature of the content in these two categories. Women were depicted as “cougars” who had also experienced losses in physical attractiveness, desirability, and reproductive functioning. In addition, they were portrayed as seeking potential ways to regain what they had lost with age—tighter, leaner bodies of their younger years. These findings corroborate the arguments of Sontag (2018) that women experience greater losses than men in old age, especially with regard to their physical attractiveness. The reference to older women as “cougars,” a derogatory term that portrays older women in the role of sexual predators, is consistent with the argument that an older woman’s sexual desire is considered inappropriate, especially when directed toward younger men (Alarie, 2019).

Men, on the other hand, were portrayed as having power and agency in relation to what they wanted from a (younger) woman/wanted in a relationship/wanted in bed. Additionally, they were represented as being in a position to make advances toward women rather than the other way around. For older men, there were no labels that belittled

them for being interested in younger women even though a large number of queries were related to older men's interest in/preference for younger women. This shows that men, unlike women, are more likely to gain power, status, and influence as they grow older, and therefore able to arrange their lives to suit their needs and wants. These findings support the argument of Sontag (2018) that men experience gains despite inevitable losses that accompany the aging process. In other words, the social costs of aging may be significantly lower for men than for women.

The one unexpected finding of this study was the higher number of queries regarding men's attire. This was surprising as the sartorial choices of women generally tend to receive greater attention than those of men who typically do not invite the intense scrutiny and judgment that women must undergo for all aspects of their appearance—hair, skin, makeup, and, of course, clothing. Considering that queries for men also included unflattering aspects such as “Why do old men's pants fall down?” (in the “appearance” category), it is interesting to see this curiosity about men's attire.

The results of the present study may be interpreted in two ways: First, Google autocomplete displays predictors based on actual searches carried out by a population, with some variations owing to a user's personal search history, current events, language, and geographical location. Therefore, Google is a mere reflection of what people wish to know in the first place. The second way to interpret the results is to both acknowledge that Google simply collects, analyses, and reflects people's search interests, and also recognize its potential to influence opinions, views, thoughts, and beliefs. It is for this reason that Google autocomplete policies prevent their algorithms from displaying predictions that are “violent or gory,” “sexually explicit, vulgar, or profane,” “hateful against groups,” “sensitive and disparaging terms associated with named individuals,” and “dangerous” (Google, 2019). The powerful nature of the autocomplete function, therefore, is well-recognized for its potential to cause harm if misused.

Research has already established that age and gender stereotypes, even though they may have some recognized adaptive functions, are generally more harmful than helpful to society as they discriminate against groups of people (Allen, 2016; Chrisler, Barney, & Palatino, 2016; B. Levy, 2009; B. Levy et al., 2000). In this study, this refers to older men and women. Whereas both men and women experience devaluation and discrimination as they age, women are often victims of “double jeopardy” for being old and female (Chepngeno-Langat & Hosegood, 2012). For decades, extensive efforts have been made to fight sexism; in recent times, efforts to counter agism are gaining momentum (Officer & de la Fuente-Núñez, 2018). The battle to change deep-rooted social perceptions cannot be won by academics and activists alone. Only large-scale, far-reaching inter-sectoral collaboration can hope to make a significant difference globally while smaller actions can

sustain such efforts locally. Google, with its wide reach and influence, can certainly make efforts to remove age and gender stereotypes from its autocomplete function under its zero-tolerance policy related to predictors that are “hateful against groups.” Although such actions may not prevent people from searching information that is stereotypical, it could at least reduce instances of “incidental learning” of stereotypes, especially the negative and harmful types. Because it is important not to restrict people's thinking or ability to search for information, a fine balance should be in place.

As mentioned earlier, this study was undertaken from the perspective of the lay user of the Google search engine. Therefore, although Google allowed us a glimpse into what people of a country were searching related to a specific topic, it was not possible to find out which age and gender groups (or other population characteristics) were involved in conducting a particular search. This is especially important for this study because it is impossible to determine who is considered “old” or “elderly” and in relation to whom. For example, a query such as “When does an elderly woman go through menopause?”, when the average age of menopause in the United States is 51 years (Mayo Clinic, 2019), may raise questions about who is performing the Google search and what age is considered “elderly” for them. Similarly, it is not possible to find out the gender of the searchers to help determine what types of searches are performed by whom.

Another observation pertains to the meanings attributed to the terms “man,” “woman,” “gentleman,” “lady,” and “guy” by the searchers. For example, in this study, it was unclear whether “guys” are considered to be a specific age group. Queries like “Why do old guys have big ears?” were consistent with similar queries related to older men (“Why do old men have big ears?”, “Why do old men's ears get bigger?”, “Why are old men's ears big?”). However, other queries with the term “guys” (“When do elderly guys lose their virginity?” or “When do old guys stop growing/mature mentally?”) raise questions about both the age group that is searching for the information and the age group about which information is being sought. Similar ambiguity was also experienced with the term “girls.” Although this was not a search term and was generated by the autocomplete function, it was unclear whether “What do older guys look for in a girl/like in a girl/want from a girl?” could be considered equivalent to “What do older gentlemen look for in a woman/in a lady?”

The lack of demographic information about the searchers may be considered a limitation that may impact the interpretation of the results of the present study. Pertinent details about the searchers could help make the data richer and the results more meaningful. However, since this study uses a layperson's perspective of user–Google interaction, this limitation is embedded in the study design itself and, therefore, unavoidable. Even then, it is important to acknowledge that the results of this same study may

vary over time, in different circumstances, or even between searchers looking up the same term simultaneously.

In this regard, it is important to note that testing ten search terms on eight computers resulted in an 87% overlap in results. This means that it may be correctly assumed, for example, that the search term “When does an elderly woman. . .” would result in the predictor “. . .go through menopause?” for most users even after accounting for their personal search history. Therefore, it may be determined that the findings of this study, most of which portray negative age and gender stereotypes, may potentially lead to the spread of such stereotypes associated with older adults.

The dual role played by Google—that of storing information indicative of preexisting attitudes as well as generating/reflecting information that may further reinforce such attitudes—is noteworthy as users of the search engine are not only influenced by search results but also influence them in turn. This cycle, repeated over multiple instances and long periods of time, may serve to engender as well as strengthen existing negative attitudes toward older men and women. Moreover, the combined recurrence of messages about older adults presented by Google and other forms of popular media, such as television, magazines, films, and Facebook, may create a formidable wall of stereotypical information that might prove increasingly difficult to breach.

This study sheds light on the general discourse surrounding older men and women in a particular type of media. The results reiterate the arguments put forth by past research about the devaluation of older female bodies, their sexuality, and reproductive functions. Conversely, it highlights the success experienced by men in maintaining, or even improving, their sexual and romantic lives irrespective of the losses that they also experience with age. Such messages, when viewed and absorbed repeatedly, may create perceptions about older adults that may determine how they are treated in society. Today, a significant amount of people’s knowledge and understanding about older adults is a result of generalized information that they pick up from media, prevalent sociocultural norms, hearsay, assumptions, or stereotypes. Often, the Internet is considered a safe place to ask questions that people refrain from asking in public. When that happens, it is worth considering how the information that people glean from the Internet could impact their knowledge about older adults.

It is important to note that this study can easily be replicated or adapted to different contexts and search engines. A cross-cultural study using these same methods can help to understand and compare trends across countries and societies. Findings from this and similar studies may be used to create aging-related communication and dissemination materials to counter commonly believed age and gender stereotypes. A study such as this has the ability to capture population-related data using an unconventional method, the findings of which can inform further research and practice.

Supplementary Material

Supplementary data are available at *The Gerontologist* online.

Funding

The work was supported by MascAge Gendering Age: Representations of Masculinities and Ageing in Contemporary European Literatures and Cinemas. GENDER-NET Plus has received funding from the European Union’s Horizon 2020 research and innovation program under grant agreement no [741874].

Conflict of Interest

None declared.

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