University of Alberta

Monitor of the Beholder: Identification of Personal Characteristics in Online Text

by

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A thesis submitted to the Faculty of Graduate Studies and Research
in partial fulfillment of the requirements for the degree of

Master of Science

Department of Psychology

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Fall 2013
Edmonton, Alberta

I dedicate this paper to my beloved family, who are no doubt relieved to see

that I have actually written it, and have not been living an elaborate lie.

Abstract

Online communication has spread into myriad forms in the new millennium, providing more opportunity for misinformation and deceit. In this study, Web users were asked for their personal estimates of authorial age, gender, and veracity for several examples of Web media, as well as on what media elements the participants used to reach their estimates. In a follow-up study, these elements experimentally manipulated. These manipulations changed participant estimates of authorial age and gender, but not authorial veracity, suggesting that participants cannot accurately identify cues in Web content that indicate veracity. Poorly appraising Web media on its veracity is consistent with previous research, suggesting that Web users do not pay much attention to aspects of Web content that suggest the content is informative or honest – relevant to psychologists, educators, and Web content creators.

Keywords: critical appraisal, information literacy, online identity, online reviews, online how-to, online dating, heuristic judgment

Acknowledgements

I would like to acknowledge and thank my supervisor, Dr. Connie Varnhagen,

for her impeccable advice, assistance, and patience.

I would also like to acknowledge Dr. Kelly Arbeau, Tom Johnson and Fred

Boyko for their aid in getting the project online and allowing participation to

move forward.

I would also like to acknowledge the members of the Applied Development and

Instructional Technology Lab for their feedback and support for the project from

its inception.

I would also like to thank Dr. Chris Westbury, Dr. Maureen Engel, and Dr.

Michael Dawson for their editorial assistance and participation in my graduate

committee.

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Chapter 1 – Introduction: Information and the Internet

In 1969, "LO" – the first two letters sent over a telephone line between computers – traveled between Los Angeles and Stanford. Unfortunately, the connection broke before the entirety of "LOGIN" could be sent. This ignominious start was the first recorded usage of ARPANET, the inter-university communications and resource-sharing project established by the Advanced Research Projects Agency in 1969 (Norberg & Herzfeld, 1990). Joseph Licklider, computer networking visionary, first articulated the concept of a distance-spanning information network as:

> "A network of such centers, connected to one-another by wide-band communication lines and to individual users by leased-wire services…that will incorporate the functions of present-day libraries together with anticipated advances in information storage and retrieval." (1960, p.7)

When it was commissioned by the Department of Justice, ARPANET was intended to simplify information transfer and rapid communication over long distances. Licklider imagined a greater system: a central nexus of information that individuals connected by a global network could interact with. ARPANET's revolutionary effect on communication between researchers in labs and universities eventually realized Licklider's vision, evolving from a professional research network into the Internet that we have today.

The modern consumer Internet maintains the information-seeking orientation of the historical ARPANET. Information online and information-

seeking behaviour by Web users has historically been one of the most dynamic

areas of research by psychologists interested in online behaviour. Early Web

research focused on Usenet, the UNIX information-trading system that predated

modern message boards. Usenet, like our boards today, provides an electronic

platform for asynchronous, archived discussion, organized by topic – a platform

that predated the commercial Web by almost a decade (Pfaffenberger, 1996).

Originally, Usenet was meant to provide easy and free access to UNIX

computing methods and applications, but, despite its original technical focus,

Usenet administrators (and the then-parallel ARPANET) found that its users were

more interested in discussing science-fiction than operating systems

(Pfaffenberger, 1996). As it grew, Usenet also provided an increasingly

accessible platform for marginalized or niche topics, such as a newsgroup for

same-sex dating (Pfaffenberger, 1990). Due to its historical primacy, Usenet was

the origin for many of the lasting traits of modern web usage: peculiar computing

terminology such as 'daemon', 'bootstrap', or 'finger', but also online

colloquialisms and shorthand, egalitarian sharing of information and tools, and a

great tolerance of free speech and open discussion, a philosophy that eventually

fell under the blanket neologism of 'netiquette' (Hardy, 1993).

Though computing has advanced considerably from the times when

maintaining a bulletin board required a university to pay for your phone line,

much of the Usenet philosophy remains. The debate over net neutrality, for

example, continues in the present day, as Web users, content providers,

politicians, and even academic researchers debate the relative worth of different

pieces of data on the Internet (see, e.g., Economides & Tag, 2012, and the

response by Caves, 2012). Though the form of the Internet is undoubtedly

different, its spirit of rapid, accessible, and egalitarian creation and collaboration

remains – a spirit that is currently referred to as the social web, participative web,

or, most ubiquitously, Web 2.0 (Coyne, 2010).

Web 2.0: Wisdom & Conceit

Web 2.0 has undoubtedly become one of the most well-worn buzzwords

ever defined since its initial coining by Tim O'Reilly (2005). Though the

definition of Web 2.0 has been the topic of occasionally pointed debate (e.g.,

Laningham & Berners-Lee, 2006), it generally refers to a move from the static

webpages of the 90s towards the dynamic, user-generated Web content of today's

blogs, Wikis, and social media (Slotta & Najafi, 2013). The hallmarks of Web

2.0 content are collaboration, interactivity, multimedia richness, and real-time

communication, which may be for practical applications (e.g., *Wikipedia*, the

Huffington Post) or for entertainment and the joy of use (e.g., *Facebook*, *The

Onion*). This paradigm shift has been assisted by the continuous improvement of

computing technology and the spreading availability of broadband Internet,

enabling more bandwidth-intensive Web applications such as podcasting, video

streaming, teleconferencing, and collaborative online workspaces such as Google

Docs (O'Reilly, 2005).

A great deal of research has gone on throughout the last decade on Web

2.0 and its sweep of modern online computing. Though much of that research

focuses on Web 2.0's business and marketing opportunities to 'mine' aggregate

online data for consumer trends and advertising opportunities (e.g., Joshi et al.,

2008), many more benign applications of Web 2.0 have been studied, such as

applications in chronic disease management (Stellefson et al., 2013), classroom

collaboration (Peters & Slotta, 2010), and informing learners in developing

nations (Heeks, 2008). Such applied research builds on the thorough basic

research of knowledge-sharing online: research on portals for user-generated

content (e.g., blogs, Wikis), comparing collaborative online projects (e.g., the

Linux operating system) to traditional methods for producing both general

information and in specific fields (Giles, 2005; Thomas, Eng, Wolff, & Grover,

2013), the motivations of Web 2.0 creators and users (Paroutis & Al Saleh, 2009),

and the demographics of Web 2.0 acceptance and use (Huang, Hood, & Yoo,

2013).

These analyses have not always been positive. There have been many

criticisms leveled at Web 2.0 platforms for degrading expertise and providing a

platform for potentially harmful misinformation (Kata, 2013). Additionally, Web

2.0 platforms have been attacked for economically exploiting the ostensibly free

labour of, for example, online moderators (Margonelli, 1999) or amateur

journalists (Walker, 2011). The most common criticism of Web 2.0, however, is

its lack of reliability. Given a platform where anyone can publish anything, the

quality of information available drops to the lowest common denominator,

making it tragically easy to post inaccurate, misleading, or biased information to

the Internet – a medium that did not have a stellar reputation for accuracy to begin

with (Cline & Haynes, 2001).

That said, Web 2.0, despite its flaws, has integrated itself as part of both individual knowledge-seeking (Golovchinsky, Pickens, & Back, 2009) and professional pedagogical methods (Grosseck, 2009). The convenience and accessibility of user-created content has, in many ways, rendered the Internet the point of initial investigation for research and informal learning (Polkinghorne & Wilton, 2010), leaving researchers to develop epistemological models for how Web users apply online resources to teaching and learning (Rowlands et al., 2008).

Additional research has been aimed at improving knowledge-seeking and information literacy skills (Walton & Hepworth, 2011) and encouraging critical analysis of online content by the reader (Varnhagen, 2005). Given the general unreliability of online content, such research is of particular importance for high-impact issues such as health research and self-diagnosis (White & Horvitz, 2009), financial advice (Stanford, Tauber, Fogg, & Marable, 2002), or political action (Kreiss & Howard, 2010), where information and misinformation alike can have serious consequences for an individual or wide-ranging impact on society.

However, even relatively everyday sources of online information can contain poor or even deceptive information disseminated by Web users. For example, instructions found on the Internet could either simplify or greatly complicate household tasks and decisions; an online review of a local restaurant might have secretly been penned by its owner; attempts at online dating lead to disappointment in a lying date. These Web 2.0 applications are commonplace, but technological progress and expanded user bases have not made them more

reliable than the Web content for higher-stakes topics such as health, investments,

or politics – in fact, they may be even more unreliable, which prompts further

research on the why and how of deception and identity online.

Online How-To Articles: So You Left Your iPhone in the Washing Machine

A natural evolution of Web 2.0 information-seeking is the online how-to

site: procedures and instructions, often step-by-step, for tasks as simple as doing

your laundry to scenarios as arcane or as obscure as repairing a soaked electronic

device. These step-by-step websites can be compared to similar resources that

preceded it, such as do-it-yourself manuals or instructional videos, with several

major additions. Firstly, using computers allows for a richer experience,

incorporating user input (e.g., automatic grocery lists for recipes you've selected),

multimedia (e.g., accompanying pictures or video clips for each step of a home

repair), or simulation (e.g., a virtual recreation of a microscope for laboratory

training). Secondly, the wide user base of the Internet means that users who

cannot find solutions for the problems they are struggling with can ask for a

custom solution on an a knowledge-sharing site and have other users create the

content reactively. The popular *Yahoo! Answers* site uses this model – users can

ask open questions that anyone can answer, and the answers are vetted by other

users and/or the original questioner on how well it addresses the problem before it

is archived for later reference (Adamic, Zhang, Bakshy, & Ackerman, 2008).

This model would have been impossible before the Internet provided a broad and

easily accessible network of knowledge, which leads to the third major difference:

size. Online how-to sites provide detailed and step-by-step instructions for

problems so specific or context-sensitive that they may never have been viable for

the traditional how-to manual format: how to shop for a big-screen TV, how to

prevent jewelry from tangling when stored, or even how to handle airsickness.

This breadth of content is especially useful given the rise of Internet accessibility

– most websites are now made to be fully compatible with modern mobile

browsing tools such as smartphones, allowing users to look up context-specific

advice with a level of mobility and accessibility beyond laptops or other previous

forms of mobile computing.

   Online how-to sites have become extremely popular as web access

expands and becomes more mobile – the highly popular how-to site *eHow.com* is

estimated to have 110 million unique visitors a month, with 8% of all American

internet users accessing *eHow* at least once a month (Alexa, 2013). However,

despite their impressive reach and the extensive amount of Web 2.0 research

occurring throughout the literature, online how-to sites have been the subject of

relatively little scientific analysis. Though much of the current Web 2.0 literature

is very relevant to online how-to sites, these sites differ from other user-generated

content such as Wikipedia in that they offer a list of applied knowledge with the

explicit purpose of walking the user through a particular procedure. This

procedural focus has a particular consequence – if the information is poor, the

consequences will be more obvious than being misled. Laundry will be stained, a

soaked iPod will short circuit, and so on. Indeed, since many such procedures are

not reversible, strong critical thinking skills are doubly important for users of

online how-tos.

Studies have analyzed how online how-to information is vetted by users – the mechanics of trust and mistrust in online communication. Researchers have examined both formal currencies of trust, such as voted ratings (Guha, Kumar, Raghavan, & Tomkins, 2004), or informal vetting, such as community reputation (Adamic, Zhang, Bakshy, & Ackerman, 2008), often as a theoretical basis for coding algorithmic models to automatically identify accurate instructions on how-to sites (Agichtein et al., 2008). Both manual and algorithmic vetting of online how-to instructions may have a considerable impact on the development of future Web applications and pedagogical tools. Online how-to sites have been a point of some research for providing context-aware instruction – how-to instructions that could adjust themselves by ontologically sorting and analyzing the current goals, resources, and environment of the user (Jung et al., 2010). By accepting several high-level goals from the user, Web users may one day be able to use a Web tool to pull together complex procedures that efficiently complete many tasks at once (Liu & Agah, 2009). Such a challenge requires not only a thorough database of procedural information (a task that websites like *eHow* and *WikiHow* are only just beginning to complete), but also a comprehensive vetting system to ensure that the combined procedures are, in fact, efficient and correct.

There are several issues confronting both researchers and users who want to find accurate how-to information online. One of the most challenging issues is breadth – though the great appeal of online how-to articles is that many topics are covered by the combined expertise of many people, this coverage can often be relatively shallow and error-prone, particularly for more esoteric topics. This can

lead to frequent cross-referencing and propagation of errors, amplifying mistakes

and leading to potentially costly fixes later on (a particularly common problem in

computing and information technology). This problem is further compounded by

the nature of online participation in such how-to websites: the majority of content

is submitted by a relatively small population of highly prolific creators, frequently

contracted freelancing journalists who often have no particular expertise in the

topic (Roth, 2009). How-to websites often direct their contracted writers to fill

out many articles in order to capitalize on frequent searches in search engines

(and thus accrue ad revenue), a phenomenon known as *content farming* or *social*

spam (Markines, Cattuto, & Menczer, 2009). Content farms dilute search engine

results and makes it more difficult for users to find quality information online,

presenting both a technical challenge as well as an information literacy task.

Search engine quality has been a topic of considerable research in recent years

(Castillo & Davidson, 2011), as well as the creation of high-quality, high-

moderation instructional sites such as *WikiHow*. Even so, it currently falls to the

user to determine which authors have produced helpful and informative

procedural information – a critical thinking task similar to that faced by readers of

other online content (Hogan & Varnhagen, 2013).

As mentioned, online how-to articles have enjoyed enormous popularity in

the do-it-yourself atmosphere encouraged by Web 2.0. As Web 2.0 divides itself

into new media and tools for interpersonal communication, its users increasingly

support these tools to spread the wisdom of the crowd, leading the newer concept

of distributed labour, or *crowdsourcing,* difficult or enormous tasks to the greater

body of Web users (e.g., Chandler & Kapelner, 2013). Another form of this

crowdsourcing phenomenon has been the growing community of online reviewers

and review Web sites – an attempt, perhaps, to challenge the task of providing

informed opinions on all the products and services available around the globe.

Online Word-of-mouth: the Online Review

Online reviews have become one of the most prolific forms of user-

generated content in modern Web usage. Where once consumers received

product information from advertisements or the occasional print article, the

takeoff of Web 2.0 produced a wealth of accessible user-created information and

opinions. Users have taken to these reviews to an incredible degree, even to the

point of trusting them beyond corporate product information or print reviews

(Chatterjee, 2001).

Online reviews are one of the most ubiquitous forms of *electronic word-*

of-mouth, a broad research classification that includes online reviews, informal

descriptions of user experiences or 'trip reports', and informal opinion statements

on media such as message boards or social networks (Bailey, 2005). Electronic

word of mouth's defining characteristic in the literature is that the consumer and

producer of the information do not typically know each other and have nothing in

common besides their mutual interest in the product or service (Kawakami,

Kishiya, & Parry, 2012). Original research into online word-of-mouth focused on

internal sources, such as a vendor website's review sections, but as research into

online word-of-mouth has expanded, researchers have expanded their scope to

include external sources of online word-of-mouth, such as independent weblogs, external review websites, and social media (Gu, Park, & Konana, 2013).

Online review sources are a common and popular destination for Web users. The popular review site *Yelp!* averages over 86 million unique visitors per month (2012). Though online review users are overwhelmingly using these Web tools to seek information, they also provide entertainment, convenience, and utility to their users through additional information such as restaurant menus, pricing options at hotels, driving directions, related products, and a host of other Web conveniences (Hicks et al., 2012). These websites benefit by providing a platform for writers of online reviews and other electronic word-of-mouth content, who are themselves driven by factors such as online reputation, a sense of social belonging, and enjoyment of helping others (Cheung & Lee, 2012).

Though product and service reviews such as *Yelp!* are the online reviews most familiar to consumers, online reviews have even reached the higher echelons of the economy – stock investments, for example, have online review systems and message boards, and high volumes of discussion about particular firms are associated with increased market volatility for that firm the following day (Antweiler & Frank, 2005; Wysocki, 1999). Antweiler and Frank (2005) suggest the increased posting and its subsequent volatility is linked to a lack of information on the part of the stock brokers and investors interested in the firm, resulting in their increased Web usage in an attempt to improve their understanding of the situation.

Even academics have found themselves as the object of scrutiny with teaching review sites, such as the popular *RateMyProfessor.com*. The website has been the subject of considerable controversy, with categories such as 'sexiness' and 'easiness' being associated with overall higher positive ratings of teaching quality (Felton, Mitchell, & Stinson, 2004). Feeley (2002) linked student ratings of professors to the well-known halo effect, suggesting that students rating their professors are more likely to score them highly on pedagogy due to charisma, personality, or physical attractiveness than the professor's actual teaching skills or how much the student learned from the class. A later study by Otto, Sandford, & Ross (2008) addressed this concern by demonstrating that student ratings of professors in different categories do not singularly co-vary with one another – in other words, that students produced independent ratings for professors on each criteria, rather than rating everything about the professor as high or low based on the professor's personality, as the halo effect predicts. Though Otto and colleagues' paper notes that *RateMyProfessor*'s ratings system is subject to considerable skepticism due to its easy-to-abuse anonymous ratings and ample anecdotal evidence of poor reviews, they also suggest that a properly researched and designed *RateMyProfessor* could provide professors with a transparent and accessible database of constructive feedback while also providing students with a way to enroll under professors who suit their learning styles.

Modern research on online product reviews often takes the form of *opinion mining* or *sentiment analysis*, a form of market-driven research designed to broadly analyze online content to sample public opinion on a product or service

(Liu, 2012). Some opinion mining focuses on the author's description of

particular aspects, functions, or applications of a product or service, while other

research measures the author's emotional attitude towards the product or service,

such as positive/negative or recommended/not recommended (Atzmueller, 2012).

The combined applications of this research include such projects as Wang, Zhu,

and Li's (2012) SumView application, an online review parser that condenses all

reviews for a particular product into a summary that encompasses the majority of

features and sentiments expressed by the review authors. Combining tools like

SumView with the rapid content generation of online word-of-mouth sources

allows consumer decisions, brand performance, and other business metrics to be

analyzed and adjusted for much faster than the standard focus group and user

questionnaire techniques commonly used in marketing today (e.g., Atzmueller,

2012; Luo, Zhang, & Duan, 2013). Additionally, the ability to condense the

often-massive review index for a product into a comprehensive and clear

summary would provide a powerful tool for consumers faced with the

overwhelming volume of information that most online review sources provide,

which can often lead user frustration due to information overload (Otterbacher,

2009).

However, even as research into the popularity and characteristics of online

reviews expands, an additional consideration has emerged from the explosive

popularity of these reviews – fraudulent reviews. As users increasingly turn to

online reviews as a source of ostensibly user-generated unbiased information,

authors, marketers, and vendors have likewise turned to writing these reviews to

ensure that the information is, in fact, biased towards the product. Hu, Lu,

Sambamurthy(2011) named this behaviour *reviews manipulation* – when

"…vendors, publishers, writers, or any third-party [are] consistently monitoring

the online reviews and posting non-authentic online reviews on behalf of

customers when needed with the goal of boosting the sales of their products."

Though ratings manipulation is a relatively new marketing technique, it

has proliferated throughout many different aspects of online commerce. Hu,

Bose, Koh, & Hu (2012) found that, when the Canadian branch of the immensely

popular e-commerce website *Amazon.com* accidentally leaked the identities of

anonymous book reviewers, many user reviews were written by the same few

people unanimously praising the product, even to the point of plagiarizing other

users' positive reviews. Their research suggests that upwards of 10% of *all* online

reviews are manipulations. Though this particular finding was recent, the

phenomenon has been readily noticeable and studied for much longer – frankly,

for nearly the entire existence of user-created product reviews (e.g., David &

Pinch, 2005).

The well-known travel guide author Arthur Frommer (2009) summarized

this phenomenon while discussing the vacationing review site *TripAdvisor.com*

and its decision to warn its users that the *TripAdvisor* review database was

compromised by fraudulent reviews:

> "Why *wouldn't* a hotel submit a flurry of positive comments
>
> penned by employees or friends? If you were a hotel owner,
>
> wouldn't you take steps to make sure that TripAdvisor contained

numerous favorable write-ups of your property? Who would fail to

do this?"

Though Frommer's comments are specific to the travel industry, the same

insight applies to virtually any other product or service. Reviews manipulation is

a low-cost, demonstrably effective method of improving business performance,

but, unfortunately, that very same business practice undermines the credibility of

the website that marketers are trying to use, and, thus, the credibility of their own

reviews. Recent research on fraud detection by consumers of online reviews finds

that consumers reading reviews do partially compensate for inflated review scores

due to reviews manipulation, but not enough to bring their appraisal of a product

or service to the level it was appraised at before the manipulation took place (Hu,

Liu, & Sambamurthy, 2011). Consumers, when faced with this manipulation

while shopping, often discard the online reviews in favor of other information,

such as the brand or price, when making their purchasing decisions (Hu, Liu, &

Sambamurthy, 2011).

Of particular note in reviews manipulation is creating credible online

personae. Much like the online how-to sites, a reviewer's user account on an

online review platform such as *Amazon* or *Yelp!* is itself reviewed by their peers

on traits such as 'helpful' or 'informative'. The largest example of such online

credibility is *eBay*'s complex 'karma' system, where users review each other upon

successful or unsuccessful transactions, thus endorsing (or condemning) their

further trading (e.g., Guha, Kumar, Raghavan, & Tomkins, 2004). Professionals

in reviews manipulations, sometimes nicknamed *guerrilla marketers*, often

maintain dozens of such user accounts, establishing online identities and

accumulating credibility well in advance of a particular project to market

(Mayzlin, 2006). These online deceptions are further encouraged by the gender

and age divides that split utilization of online resources. For example, male

consumers are more likely to use online reviews written by an anonymous author

than a female consumer, but female consumers show a large increase in their

acceptance of an online review if it comes from a trusted source (Gabarino &

Strahilevitz, 2004). Such deceptions have taken a central position in the

ubiquitous 'buzz marketing' that accompanies products and services in a wide

range of categories, from musical releases to tourist destinations (Thomas Jr.,

2006). Though the concept of marketing via word-of-mouth is not new by any

means, the ease by which marketers can deceive consumers online, in addition to

the volume of content that a devoted online marketer can create, regulators such

as the Federal Trade Commission face a unique challenge in identifying,

regulating, and, if necessary, silencing these guerrilla marketers if they mislead

consumers under false pretenses using false identities (Sprague & Wells, 2010).

Though guerrilla marketers are quickly becoming an omnipresent hassle in

Web communication, a slick PR firm is hardly the first thing that comes to mind

when considering false identities online. Instead, the stereotype of online

deception is something closer to a lonely or dysfunctional man with a computer

pretending to be a maiden or an elf. Though the integration of the Web into

modern life has lessened this stigma, the stereotype still colours modern attitudes

towards meeting people online, such as the now-extensive online dating scene (which, admittedly, lacks any opportunity to be an elf).

Online Dating: New Frontiers in Confusion

As any glance at a Google advertisement sidebar demonstrates, online dating websites have become entrenched in both the social system of the Internet and in the modern dating scene. Though mediated matchmaking methods are not new (consider newspaper personals or the brief fad of video dating in the 1980s, for example; see Woll & Young, 1989), nor are they even new to the Internet (several Usenet newsgroups were devoted to dating and matchmaking; see Pfaffenberger, 1996). However, online dating dwarfs previous methods in popularity due to its large user base, ease of use, and rich multimedia format. Since ascending in the last decade, online dating and matchmaking has shown a considerable diversification in both size and scope, from general dating sites such as *OKCupid* or *eHarmony* to dating websites specialized for particular ethnicities, locales, or shared interests (Sullivan, 2008). The expansion and specialization of online dating, increased media and popular exposure, and vastly improved Internet connectivity of the modern era created a critical mass of online dating users that makes it a viable source of potential partners for many demographics (Hogan, Li, & Dutton, 2011). An exploratory study by Mascaro, Magee, and Goggins (2012) has also shown growing diversity in online dating goals and accomplishments, with the users of some websites focusing on marriage while the users of other websites focus on dating or platonic relationship. The explosive

growth of online dating services has even generated a significant economic impact, recording multi-billion dollar revenues in 2012 (IBISWorld, 2013).

However, even as its popularity grows, online dating has also been criticized on a variety of fronts in the media – for example, that the websites are ineffective for finding partners, or that the users of online dating sites are less attractive (e.g., Kayawe, 2011). Though there are certainly many concerns for both new and experienced users of online dating, these stereotypes are often demonstrably wrong, as users of online dating websites report satisfaction with partners they meet online, considerable long-term relationships starting on online dating sites, and success in relationship goals achieved at least partially via online dating (see Schmitz et al., 2012, for a review).   The stigma associated with online daters as being desperate, philandering, or scamming has faded in recent history, particularly with the popularity of online dating with younger users looking for more relaxed relationships (St. John, 2002).

However, this stereotype hints at the much more complex issue of deception in online dating – the belief that the users of online dating profiles are older, shorter, poorer, and more married than their dating profiles suggest (e.g., Seal, 2013). When asked, online dating users identify deception as the #1 concern with online dating (Brym & Lenton, 2001). Users' concerns are well-founded; many aspects of online dating lend themselves to increased deception, such as its asynchronicity, ease of editing, and relatively low investment compared to traditional dating methods (Cornwell & Lundgren, 2001).

Considerable research has examined disclosure versus deception in dating profiles, the different methods by which users present themselves, and the preferences and interactions of users who browse these profiles. Both deception and honesty in online dating profiles has often been studied as an aspect of *impression management*, the well-researched theory about the adjustments and compensations we make to achieve our social goals and maintain our standing with others. Goffman (1959), in his seminal book on impression management, describes impression management as when someone is, "...influencing the definition of the situation which others come to formulate, and influencing this definition by expressing [oneself] in such a way as to give [others] the kind of impression that will lead them to act voluntarily in accordance with his own plan" (p. 4). The social forces that drive us to seek acceptance and cooperation through impression management are exceptionally strong; people have been shown to engage in selective behaviour and self-promotion even with total strangers (Schlenker & Pontari, 2000). Impression management has become a growing aspect of online communication, from issues as minor as maintaining aesthetics and privacy in an online journal (Hodkinson & Lincoln, 2008) to problems as serious as job eligibility, or even continued employment, being compromised by undesirable photos or messages from a user's online history – a notoriously difficult error to erase from the Internet (Hill, 2011).

That said, impression management is of particular importance in dating, where both participants interact with each other to confirm whether or not their date is worth pursuing a relationship, while simultaneously attempting to project

(or "give off" in Goffman's parlance) what they hope their date is looking for,

even if it is only loosely or not at all true (e.g., Rowatt, Cunningham, & Druen,

1998). Online dating is no exception, and research on impression management

and deception in online dating may show more potent effects than in offline

dating (Ellison, Heino, & Gibbs, 2006). Deception is perceived as the "main

disadvantage of online dating" by users (Brym & Lenton 2001), and for good

reason – recent research on tracking deception in dating profiles suggests that as

much as 80% of dating profiles on larger dating websites are at least somewhat

deceptive (Toma, Hancock, & Ellison, 2007). Research on deceptive dating

profiles suggests that lying profiles tend to be of shorter length, tend to be edited

more frequently, and tend to avoid discussing the topic that was lied about, such

as avoiding talking about work if the author lied about their income (Toma &

Hancock, 2012).

Unfortunately, users asked to report on the trustworthiness of these

profiles perform poorly, basing their decision on ineffective deception cues such

as sentence length or grammatical clarity (Toma & Hancock, 2012). Previous

literature also shows that participants generally perform poorly on any deception-

detection task, and the single greatest predictor of a deception judgment is the

credibility of the liar – a non-factor in online dating (for a meta-analytic review,

see Bond & DePaulo, 2008). Participant errors were not random, however –

generally, participants asked to judge dating profiles will rate all or nearly all

profiles as at least somewhat trustworthy (Toma & Hancock, 2012). This is

similar to other forms of deception detection research, particularly in its *truth bias*

– the tendency for participants to err on the side of trust, rather than mistrust (Levine, Park, & McCornack, 1999). This is also consistent with other deception-detection tasks online; the cues that people use to try and detect falsehoods are not at all effective at actually finding liars online (e.g., Hancock et al., 2008).

Internal statistics from dating websites illustrate how common impression management is while dating online. *OKCupid.com*, one of the largest free dating sites, publicly publishes considerable internal statistics about their users, including common deceptions in their dating profiles. For example: the distribution of heights of all *OKCupid* profiles in the United States is approximately 2 inches higher than the actual distribution of heights in the U.S.; the stated income is about 20% higher; and 77% of users who list themselves as bisexual exclusively contact users of a single gender (Rudder, 2010). Even photographs can be a source of considerable deception – metadata tags show that photographs other users rated as 'hot' were much more likely to have been taken longer ago than less attractive photographs (Rudder, 2010).

However, these same statistics also indicate that the numbers people lie about when creating a dating profile may also have a significant impact on the user's success rates. For example, users of *OKCupid* who reported a higher income received a much higher volume of propositions from other users, particularly for profiles of older male users (Rudder, 2010). This is consistent with both research findings about impression management and related findings about deception detection – though users know that dating profile incomes are

often deceptive, there isn't a strong enough correction by readers to shift towards other criteria for selecting potential matches.

Though there are certainly many petty reasons to lie on a dating profile, there are also serious ethical considerations about the use of deception and selective disclosure in online dating. Users with disabilities (Saltes, 2013), sexually-transmitted diseases such as HIV (Mazanderani, 2012), or who have not yet disclosed a sexual identity to their relatives or peers (McKenna & Bargh, 1998) may find online dating as a powerful tool due to its accessibility, relative anonymity, large user base, and its many niche sites for members of smaller groups. However, these users are also under heavy pressure to conceal information that they may wish to keep private or that they feel might discourage partners from ever contacting them, even though that information may very well have an impact on how a relationship might develop – if at all.

Online dating is, by definition, a vulnerable endeavor, where users have to reveal their personal preferences and habits for scrutiny by potential partners. It is no surprise that users often hide or distort personal information that they consider to be embarrassing or otherwise short of the ideal. However, though deceptive online dating profiles are so common as to be a stereotype among Web users, they are not the online deceptions that commonly receive the most attention from the media or from Web users at large. This attention is not necessarily in the form of exposing the deception – in fact, it is often the opposite.

Chapter 2: Deception, Identity, & the Internet: a Web of Deceit

The Internet is an extraordinarily flexible tool – the applications described in the previous chapter encompass only a small part of modern online interactions. However, these disparate applications face a common challenge of reliability. The untrustworthy nature of anonymous online communication has literally become a cliché – "on the Internet, no one knows you're a dog" (Christopherson, 2007). Simply put, the anonymous and unregulated nature of the Internet means that the end user must be on guard for being misled by other users: a bad review, an inaccurate how-to, or the dating profile of an apparently tall and single man.

Motivations for such deceptions span the entire spectrum of the human condition. Consider, for example, the debacle of *A Gay Girl in Damascus*, a weblog ostensibly written by a Syrian lesbian in a puritan Muslim state. The mass media exemplified her in the most literal sense, making frequent citation and reference to the blog; CNN even held an e-mail interview with Amina, the blog's author, about her life in a state that frequently prosecutes homosexuals (Davies, 2011). When her blog announced that Amina had been seized by Syrian authorities, the international LGBT community was outraged.

Not long afterward, the abduction, and, indeed, the entire blog was exposed as a hoax perpetrated by a graduate student in Edinburgh, Scotland. Though Tom MacMaster, the actual author of the blog, defended himself as illuminating homosexual issues in Syria, actual LGBT writers reviled his

presumption, and he was censured by the University of Edinburgh for misusing

computing resources (Ryan, 2011; University of Edinburgh, 2011).

Though the blog and its subsequent unmasking was both highly visible

and highly costly in terms of time wasted and money spent, MacMaster was by no

means the first fake blogger, or even the first fake lesbian blogger talking about

LGBT rights (Flock & Bell, 2011). It certainly did not help that his hoax

occurred in the midst of a political uprising that many at least partially credit to

social media (Communello & Anzera, 2012), but the main issue remains – even

journalists and political analysts, who we would expect to be highly critical of a

sensational political story like MacMaster's blog, were still fooled, damaging

their credibility and wasting both their own resources and the resources of their

news networks.

Donath (1999) noted how obscurity and lack of cues make deception

online easier, lower-stakes, and harder to detect than real-world deception,

allowing for users to experiment with alternate identities as a form of

entertainment, roleplaying, reputation-building, or simply as a prank. Though the

added richness of modern Web applications has made this more difficult in some

ways, it has also added new avenues for deceiving others, only some of which

have been described here.

In addition to these personal factors in online deceit, economic

exploitation via false identity has plagued the Internet for nearly its entire

lifespan. Most forms of online exploitation, such as the infamous Nigerian 419

scam (a scam that convinces a user that they will be rewarded with riches if they

provide money to the scammer now) rely on the anonymity of the Internet to forge false identities as part of their scams. Besides inflicting significant economic damage on their own (Rosenberg, 2006), these scams require legal regulation, law enforcement, and technological safeguards to defend users – often leading to a technological 'arms race' between spammers and Web security, a considerable economic drain in and of itself (Guerra et al., 2010).

Economic exploitation of false identity and misrepresentation on the Internet is not limited to direct scams such as advance fee fraud. As mentioned earlier, stealth marketing via ratings manipulation via blogs, message board posts, YouTube clips, and so on are becoming endemic to social media, poisoning the quality of these sites and reducing their usability. Even experienced users cannot accurately identify such manipulations (Ott, Choi, Cardie, & Hancock, 2011; Hu, Liu, & Sambamurthy, 2011), much like any other deception-detection task (Bond & DePaulo, 2006; Bond & DePaulo, 2008). Though algorithmic solutions for filtering out false reviews from review sites are being developed (Ott et al., 2011), stealth marketing continues on more personal levels, such as message boards or social media.

In addition to the formidable challenge of exploitative online deception, there is still the all-too-likely possibility that the information simply being wrong. There are considerable economic benefits to online content that does not hinge on accuracy. For example, *eHow*, which relies on having information on a very broad base of topics to propel their website into high rankings in search engines, made $200 million in advertising revenues in 2009 (Roth, 2009). This income is

not reliant on providing *accurate* information; simply viewing the ads

accompanying the how-to generates revenue. Many less formal online

information sites assert false information without any specific malicious intent,

even if those movements are a great threat to public health, finances, or legal

standing. Highly researched examples include the anti-vaccine movement (Kata,

2012) or HIV-AIDS denialism (Smith & Novella, 2007). These movements rely

on a falsely assumed mien of medical authority, in addition to the Web 2.0

movement of personal empowerment and active self-diagnosis, to put lives at risk

due to completely preventable diseases. Financial speculation – and ruin – based

on online assurances of profitability are also common among Web users – for

example, the Bitcoin 'cryptocurrency' that briefly ballooned in 2011 before

bottoming out in 2012 was created by a Japanese programmer named Satoshi

Nakamoto. Ironically, Nakamoto has since been revealed as a pseudonym, and

the real programmer remains unidentified (Wired, 2011). Even the most banal of

online situations or facts can be deceptive – a high-profile academic professor and

prolific Wikipedia editor was exposed as completely unqualified, leading to all

the Wikipedia articles he worked on having to be re-validated (Schiff, 2006).

A more local example of an online identity and its political consequences

was the @Vikileaks Twitter account, where an anonymous user posted the

divorce affidavit of Public Safety Minister Vic Toews in response to the

minister's proposed electronic surveillance bill (Fitzpatrick, 2012). The Twitter

account was originally thought to be authored by a member of the Official

Opposition, leading to several fiery attacks by Conservative Members of

Parliament on the New Democratic Party before the true identity of the author

was exposed to be a Liberal Party staffer, later fired for his indiscretions.

Minister Toews's Bill C-30, *The Protecting Children from Internet Predators Act*,

was itself a legislative attempt to combat online deception and child predation by

allowing law enforcement and government officials widespread access to user

data from internet service providers without judicial approval (2012).

   Of all online deceptions, online child predation has seen the most attention

from mass media and the most political action. Surging media and public interest,

including dramatic TV exposés such as the *To Catch a Predator* series, has driven

law enforcement to act, nearly tripling the amount of arrests for online child

exploitation in America between 2000 and 2006 (Mitchell, Wolak, & Finkelhor,

2011). Police themselves use false online identities, pretending to be youths in

order to lure and identify online predators or acting as collaborators to collect

evidence (Mitchell, Wolak, & Finkelhor, 2010). Likewise, educating children

about staying safe online has become an educational mandate for computer

literacy in schools, as well as charitable groups such as the Canadian Centre for

Child Protection (2012).

   These examples have all had serious impacts on finances, public health,

politics, academia, and, more generally, our day-to-day usage of the Internet.

Given the overwhelming amount of information available on the Internet, Web

users have to selectively utilize the resources accessible online – either by

choosing the resources that provide accurate and unbiased information, or

otherwise. These issues of appraisal – Bitcoins or vaccine denial alike – are a

problem of critical thinking and information literacy, an educational goal adopted by many modern curricula, including undergraduate education (American Library Association, 2000), medical updating (Reynolds et al., 2012), and Canadian public school boards (e.g., Edmonton Public School Board, 2013). Critical thinking skills allow users to discriminate between different information sources and strategically apply such sources to their own work, education, and lives (Fisher, 2001). Research on critical thinking is not unique to the Internet by any means, but given the uncited, anonymous nature of most online information (Levine, 2005) and the rarity of disclosed commercial interests or contact information (Greer, 2003), critical thinking skills have quickly become a necessity for learning from the Internet effectively.

Modern Web users, especially younger users, have been in many ways treated as qualitatively different from previous information seekers. Terms such as 'digital natives', 'the Google generation', or 'Wiki fledglings' have all been used to suggest that the learning and critical thinking styles of Web 2.0 are divorced from the skills of reading books and attending lectures, and that educational and research methods must adjust to match (Lea & Jones, 2011). How users discriminate between Web resources has been a topic of considerable research – how Web users seek information online, under what circumstances users apply different search strategies, and whether or not those strategies are effective (Biddix, Chung, & Park, 2011). Strategies can be as simple as using the first resource that comes to hand (Bar-Ilan, Keenoy, Levene, & Yaari, 2009), judging based off website aesthetics, or preferring easy-of-use websites (Flanagin

& Metzger, 2007), or as complex as vetting the author's credentials, considering potential sources of bias (such as ad sponsors) and cross-referencing with other reliable sources (Varnhagen, 2005). These strategies further vary in their application – users frequently admit to not always using the criteria they consider important in vetting online information (Walraven, Brand-Gruwel, & Boshuizen, 2009), and their measured application of online critical appraisal skills varies along with their previous domain knowledge, motivation to acquire accurate information, and general understanding of computing and Web technology (Daniels, 2007).

Though there is considerable research in strategies Web users apply during focused information-seeking, particularly in an academic context, there is a corresponding lack of research on the day-to-day critical appraisal strategies of Web users during casual browsing (if any). In some situations, such as online dating, users apply uncertainty reduction techniques such as running a user's picture through a search engine or looking them up on separate social media websites (Gibbs, Ellison, & Lai, 2011). When asked to directly appraise websites, however, Web users generally show little to no discrimination based on the quality of the information (Hogan & Varnhagen, 2013).

When a Web user tries to identify a Web author's characteristics and quality, the user is essentially engaging in a heuristic judgment task, where the Web user must use the inconclusive information provided by a Web artefact to decide whether or not the artefact is valuable, or even if the author of the Web artefact is presenting themselves truthfully. Even before the existence of the

Internet, similar judgment tasks have been the centerpiece of research on how people make decisions under uncertainty, make errors or show biases, and otherwise operate without complete information. Tversky and Kahneman's (1973, 1974) seminal works on judgment under uncertainty have shown that participants asked to make decisions without incomplete information do not act randomly, but instead apply systematic and nuanced heuristics to their conclusions. These heuristics, they note, are not inherently poor, but carry flaws that manifest as specific errors to produce poor or illogical conclusions (Kahneman & Tversky, 1986). The same could be said of the modern Web user confronted with online information – heuristics developed offline or in different online contexts may be serviceable in many situations, but may occasionally, or even frequently, lead users to accept poor information at face value. The question for the modern day is whether or not these systematic heuristic biases can be identified in Web users' judgments of different online contexts, manipulated by authors or psychologists, or explicated by the Web users themselves.

These heuristic judgments are of particular importance for how users identify their fellow users, especially when they are relying on those users for information. Authorial credentials are an important part of critically analyzing advice and information for accuracy and bias. Furthermore, source attributions during online social interaction impact user response and acceptance of errors in and of themselves, such as mistakenly believing information comes from an expert or a scientist (Sundar & Nass, 2000). User identity is often central to many social media interactions, such as online dating. Kahneman and Tversky's (1973)

classical study was actually a very similar task, where participants were asked to read tracts describing different unknown individuals and then asked to identify each individual's profession. Even when the participants were provided with the job demographics of the unknown participants, their judgments were based wholly on their readings, using stereotypes and group representativeness to make their decisions. Participants judged heuristically even when the tracts were wholly uninformative, suggesting that heuristics replaced, rather than working alongside, prior information about the descriptive tracts, such as base rates and probability.

The task of finding high-quality Web content is a challenge faced every day by many users. However, due to the complexity and volume of Web content, the usage of heuristics and systematically biased judgments in acquiring Web information has greatly influenced modern Web research, leading to our research topic: identification of authors online. This can be expressed as a form of Kahneman and Miller's norm theory (1986), where people identify and classify new objects by how strongly the object's attributes evoke particular elements of a previously learned category. Similarly, a Web user's analysis of the content they read is based on their internal normative understanding of which specific attributes of Web content make up the elements of a highly convincing post. Like the heuristic biases in Kahneman and Tversky's (1986) work, these internal norms and representations are not inherently poor, but can have specific weaknesses or flaws that, for example, may lead to consistent overestimation of a Web artefact's quality due to a particular element such as high-quality Web design (aesthetics) or

the ease of finding the artefact on a search engine (availability). These attributes

may very well contribute to a Web user's normative representation of a good or

accurate Web artefact, and indeed may serve to find many high-quality Web sites,

but they are not necessary nor sufficient for a Web artefact to be accurate or

useful, and so provide a backdoor for deceptive or inaccurate Web information to

be accepted by users (Hogan & Varnhagen, 2013).

By basing our concerns about Web content and identity online in the form

of heuristics and norms, we focused on the following issues:

1. How do Web users identify each other, particularly in casual and brief

   interactions? Do users accurately identify a Web author's age, gender,

   and level of knowledge about a topic from the writings of that author? If

   the author is being deceptive or uninformative, can a Web user detect it?

2. What heuristics, attributes, or cues do Web users examine when asked to

   identify another user's age, gender, and veracity during these brief

   interactions? Are these cues superficial factors such as user avatar or user

   name, linguistic cues such as grammar or spelling, or semantic cues such

   as the user's style of writing or the content thereof? Are these cues

   systematic? How strongly do they determine a participant's judgment of

   an author?

3. Can those cues be successfully manipulated to experimentally change

   Web users' perceptions of age, gender, and veracity? In other words, can

   we experimentally examine whether or not the cues participants *say* they

   use in appraising a Web author are the cues they are *actually* using?

Study 1: Initial Appraisals & Identification of Key Characteristics

Experimental Summary

In order to analyze both how users identify each other online and the efficacy of manipulating those identifications, our study was divided into an initial observational study, then a larger follow-up experimental study.

Our initial <u>Study 1</u> was an observational questionnaire that asked a sample of Web users to appraise a series of Web artefacts – online reviews, online how-to articles, or online dating profiles – then estimate each author's age, gender, and veracity in terms of knowledge of the topic or honesty displayed. These results were then compiled into their descriptive statistics for summary of how participants categorized the authors of different Web artefacts, as well as how confident the participants were in their estimates (<u>Research Question 1</u>). The participants were then asked to identify what factors or cues had led them to make their appraisals – such as presented identifiers like username or user avatar, linguistic considerations such as grammar or vocabulary, or changes in the content, accuracy, or style of the artifact, which were then counted and ordered by frequency of use (<u>Research Question 2</u>). Users were also asked for their demographic information and patterns of Web tool usage in order to analyze any possible individual factors in the appraisal of Web artefacts.

Participants

Both studies were undertaken using the University of Alberta's Research Participation Program, where undergraduates assist in psychological research as part of their introductory psychology curricula. Participants were awarded partial

course credit in exchange for assisting for approximately 45 minutes to 1 hour.

Participants assisted in the study by completing an online questionnaire presented

via Google Forms (forms.google.com). Participants were also given the option of

instead completing a short research assignment on identification and deception

detection in online dating for their course credit instead (no participants chose this

option). Participation in this study was approved by the University of Alberta

Research Ethics Board, as well as the administration of the Research Participation

Program within the Department of Psychology.

Demographics

Study 1 sampled 30 undergraduate participants from the undergraduate

research pool, as described above. Of these participants, 3 were excluded due to

blank or mostly incomplete forms (n=27), with 7 males and 20 females. Data

collected about the participants included their age, their self-reported computing

experience (in years) and self-reported Web experience (in years), and their self-

appraised computing and Web expertise (on a Likert scale of 1-5). These

demographics are summarized in Table 1.

	Minimum	Maximum	Mean ± (Standard Deviation)
Age	18	25	21.30 ± (1.82)
Computing Experience (years)	7	18	11.74 ± (2.84)
Computing Expertise (1-5)	2	5	3.37 ± (0.74)
Web Experience (years)	5	15	10.26 ± (2.64)
Web Expertise (1-5)	3	5	3.78 ± (0.64)

Table 1: Summary of participant demographics from Study 1.

Participants were also asked to report their relative usage for different Web tools on a Likert scale of 1-5: how-to websites, online forums, weblogs, online news sites, online dating sites, online review sites, and social media websites. These demographics are summarized in Table 2.

	Never used	Used rarely	Used sometimes	Used frequently	Used constantly
Self-help/How-to	3	6	6	11	1
Online reviews	3	5	11	6	2
Online dating	19	5	1	1	1
Blogs	4	7	10	3	3
Forums	1	6	11	7	2
Online news	2	5	11	8	1
Social media	0	0	6	8	13

Table 2: Summary of participant self-reported usage of several Web tools from

Study 1.

Questionnaire Characteristics

After demographic collection, participants were given a 12-section questionnaire, with each section concerning a particular Web artefact: 4 online reviews, 4 online how-to articles, and 4 online dating profiles. These artefacts varied greatly in their length, accuracy, writing style, and so on – the artefacts can be found at http://www.ualberta.ca/~jsaleh/v2, and in Appendix I. Participants were asked to read over each presented artefact and asked for:

- Their personal estimates of:
  - the author's age (in years)
  - the author's gender

- o the author's level of knowledge of the topic (for online reviews

     and online how-to articles) or the author's level of honesty (for

     online dating profiles) on a Likert scale of 1-5, collectively

     referred to as veracity

- The cues the participants used to make their conclusions about the

  author's age, gender, and level of knowledge, either selected from a

  checklist of potential cues, by free-writing, or both

- Their confidence in each estimate on a Likert scale of 1-5, with 5 being

  most confident

Figure 1: An example of the Web artefacts used in Study 1 – in this case, an

online review of a Chicago hotel.

After all participants had completed the questionnaire, the data was collected

and coded for the following analyses:

- The relative levels of estimation and confidence in estimates of age, gender, and veracity between different artefacts of the same type of Web content

- The self-reported cues used by participants in their estimations of the author's age, gender, and veracity

- Differences in cues used by participants, both between different artefacts of the same Web content and between different types of Web content

- Potential demographic influences on participant estimates or confidence in their estimates

The Study 1 questionnaire had two major goals. Firstly, the questionnaire provided an overview of what participants think of different Web artefacts and how particular aspects of Web content play on their personal biases and experiences with Web content. In other words, Study 1 was meant to identify the potential heuristics used by participants when asked to make judgments using incomplete information. Secondly, the questionnaire provided concrete, quantitative examples of what manipulations to perform on each artefact in order to convert the artefact to having an author of a particular age, gender, or level of veracity. The factors identified allowed for the direct experimental manipulations in Study 2, where we tested the accuracy of participants' stated thought processes about their analyses of Web content.

Results & Discussion

Study 1 demographic analyses. Gender had no significant impact on participant

confidence levels in their estimates ($F(1, 19)=2.100$, p=0.95). Participant

confidence level was likewise not affected by computing expertise (F(3, 17)=2.22,

p=0.13) or web expertise (F(2, 18)=0.43, p=0.66). However, note that, as the

degrees of freedom suggest, there was a floor on participant responses – no

participants rated themselves below a 2 out of 5 on computing expertise, or below

a 3 out of 5 on Web expertise.

The final demographic analysis was to check if previous experience with

the studied Web tools (online reviews, online how-tos, or online dating) had an

effect on a user's confidence in their responses. However, none of online review

experience (F(4, 19)=0.44, p=0.78), online how-to experience (F(4, 21)=1.02,

p=0.42), nor online dating experience (F(4, 20)=0.75, p=0.57) had an effect on a

user's confidence in his or her estimates.

Online reviews: age estimates. Participants were asked to estimate age of the

author for four different online reviews, as well as their confidence in the

estimates; their estimates are summarized in Table 3.

	Minimum	Maximum	Mean ± (Std. Dev)	Confidence Mean ± (Std. Dev)
Online Review 1: Chicago Hotel	18	60	31.46 ± (9.68)	2.89 ± (0.93)
Online Review 2: Edmonton Diner	23	45	32.46 ± (5.19)	3.42 ± (0.76)
Online Review 3: Montreal Diner	16	45	26.63 ± (6.61)	3.31 ± (0.84)
Online Review 4: Penticton Pub	25	40	30.78 ± (4.58)	3.48 ± (0.89)

Table 3: Participant age estimates and confidence for unmanipulated online

reviews.

Online reviews: age estimates & cues commentary. Artefacts with higher

participant confidence and lower variance in estimated age also used fewer cues –

Case #1, a review for a Chicago hotel, had the most ambiguous case in terms of

cues used, had the widest estimate variance, and lowest estimate confidence.

Case #4, a very short review of a Canadian pub, had the lowest variance in

estimates and highest confidence. This suggests that participants either find a

sufficiently strong indicator of the author's age and decisively come to a

conclusion, or consider many cues to come to a conclusion more ambivalently. In

the pub review, participants' conclusions about age were almost always based

only on the author mentioning her husband in the review.

Another informative comparison is between Case #2 and #3 – both

reviews for urban restaurants. Both cases included a photo of the author, their

real name, and their description of eating once at the restaurant. Neither review

directly mentioned the author's age. In the second case, the participants almost

all based their age estimate at least partially on the author's user picture (81%). In

the third case, however, many participants cited other factors to determine the

author's age, such as her grammar, vocabulary, and especially the aggressive

writing style of the post (74%). This suggests that different cues can take

precedence over one another – in this comparison, the photo of the user in the first

restaurant review was the strongest cue to the author's age, but in the second

review it was overtaken by the text of the review.

The most frequently used cues by participants were the style of the post

(64% of participant responses), the author's user avatar (44%), and the vocabulary

of the author (40%).

Online reviews: gender estimates. Participants were also asked to estimate the

gender of the author for four different online reviews, as well as their confidence

in the estimates; their estimates are summarized in Table 4.

	Sum Male Estimates	Sum Female Estimates	Confidence ± (Std. Dev.)
Online Review 1: Chicago Hotel	8	19	3.26 ± (1.06)
Online Review 2: Edmonton Diner	27	0	4.26 ± (0.94)
Online Review 3: Montreal Restaurant	1	26	3.81 ± (0.83)
Online Review 4: Penticton Pub	2	25	4.37 ± (0.97)

Table 4: Participant gender estimates and confidence for unmanipulated online

reviews.

Online reviews: gender estimates and cues commentary. Similarly to the age

estimates, the most ambiguous case for gender was also Case #1, the review of the

Chicago hotel, with the most split in gender estimates, lowest confidence in

estimates, and most variation in cues used. Case #4, the short review of a

Penticton pub, had the highest overall confidence in estimated gender, even

though Cases #2 and #3 had photos for user avatars while Case #4 did not. Again,

this suggests that a sufficiently strong gender indicator leads participants to ignore

other cues and confidently reach a conclusion – also, in this case, that the author

mentioned her husband in Case #4.

Case #2 and Case #3, the two restaurant reviews, both had almost total

agreement on the gender of the authors, likely because of the photo of the author

and the author's first name, both included in each review. The one dissenting

participant in Case #3 did not cite either cue in their response, suggesting that

they were not convinced or did not notice the author's profile. However, even

though the author's name and picture were explicitly stated in the third case,

participants were still not as confident in the author's gender as they were in Case

#4, where the author did not have a self-portrait for a user avatar.

The most frequently used cues for gender were username (54% of

participant responses), writing style (50%), and user avatar (44%).

Online reviews: veracity estimates. Participants were asked to estimate the

knowledge of the author about the topic for the four online reviews, as well as

their confidence in the estimates; their estimates are summarized in Table 5.

	Mean Knowledge ± (Std. Dev.)	Confidence Mean ± (Std. Dev.)
Online Review 1: Chicago Hotel	3.04 ± (0.79)	3.00 ± (0.78)
Online Review 2: Edmonton Diner	3.70 ± (0.61)	3.65 ± (0.89)
Online Review 3: Montreal Restaurant	2.89 ± (0.89)	3.38 ± (0.94)
Online Review 4: Penticton Pub	3.07 ± (0.68)	3.41 ± (0.84)

Table 5: Participant estimates of knowledge and confidence for unmanipulated online reviews.

Online reviews: veracity estimates and cues commentary. In the free-written section, no participants mentioned the star rating (of the reviewed service) or the trust ratings (the author's ranking or number of written reviews) of any review as part of their appraisal of the author's veracity. Free-written commentary on how participants appraised authorial knowledge mentioned criteria such as "detailed, lots of observations"; "descriptive without being wordy"; and "concrete experience". Participants valued examples and being well-written – Case #2, a review of an Edmonton restaurant, was reviewed much higher than Case #3, a review of a Montreal restaurant, due to its more dignified writing style and more concrete focus, even though the reviews were of comparable length and covered similar aspects of both restaurants.

The most commonly used cues from the checklist were the author's writing style (59% of participant responses), accuracy of the post (46%), and the topic of the post (37%).

Online how-to articles: age estimates. Participants were asked to estimate age

of the author for four different online how-to articles, as well as their confidence

in the estimates; their estimates are summarized in Table 6.

	Minimum	Maximum	Mean ± (Std. Dev.)	Confidence Mean ± (Std. Dev.)
Online How-to 1: Diaper Changing	25	50	31.46 ± (6.28)	3.22 ± (0.85)
Online How-to 2: Frying Eggs	26	65	46.30 ± (12.22)	3.63 ± (0.84)
Online How-to 3: Repairing iPods	18	35	25.41 ± (3.73)	3.63 ± (0.84)
Online How-to 4: Cleaning Showers	20	70	38.26 ± (9.00)	3.00 ± (1.00)

Table 6: Participant estimates of age and confidence for unmanipulated online

how-tos.

Online how-to articles: age estimates & cues commentary. Case #5,

concerning changing diapers, had low variance in age estimates despite having no

author bio – suggesting that the parenting context alone was sufficient for

participants to place the author around parenting age (range of 25-50 years old).

Case #6, a how-to article about frying an egg, had a very large estimate

variance. This can be explained by the author's bio, which mentioned the author's

career as a writer began 37 years ago. Many participants took this to be the

author's actual age, while other participants added approximately 20 years to that

to estimate her age when she began her career. This may have been further

compounded by the author using an old picture for a user avatar. This is

supported by Case #7, about repairing an iPod, which had a similar bio (stated

author's career starting date, but not the author's actual age) but had very low

variance, in contrast, because it used a more recent user picture and because the

author in Case #7 had a shorter career (and thus less room for arithmetic error).

This further suggests that participants zero in on strong cues and use them to the

exclusion of other cues that might contradict their conclusion – even when a more

critical reading of the artefact would make it relatively easy to make a more

accurate estimate. In Case #8, about cleaning a showerhead, there was

considerable variation – more so than Case #5, about diaper changing – likely due

to the lack of any direct indicator of the author's age. Most participants (81%)

cited the topic of the post as a reason for their age conclusions, with many

participants (48%) citing *only* the topic of the artefact as the reason for their

conclusion, further indicating the lack of cues in the artefact for participants to

analyze.

The most frequently used cues by participants were the topic of the post

(69% of participant responses), the style of the post (39%), and the user avatar of

the author (32%).

Online how-to articles: gender estimates. Participants were also asked to

estimate the gender of the author for four different online reviews, as well as their

confidence in the estimates; their estimates are summarized in Table 7.

	Sum Male Estimates	Sum Female Estimates	Confidence ± (Std. Dev.)
Online How-to 1: Diaper Changing	1	26	3.63 ± (1.04)
Online How-to 2: Frying Eggs	0	27	4.19 ± (0.87)
Online How-to 3: Repairing iPods	1	26	4.15 ± (1.03)
Online How-to 4: Cleaning Showers	16	11	2.89 ± (1.22)

Table 7: Participant gender estimates and confidence for unmanipulated online

how-tos.

Online how-to articles: gender estimates and cues commentary. Case #5, the

how-to article for changing diapers, had no authorial information at all, but was

still overwhelmingly rated as a female author's work, again suggesting the

contextual cue of parenting (in this case, a stereotypically maternal task) was

sufficient for participants. However, rated confidence was not as high as the

profiles with gendered user avatars. Case #8, which provided instructions for

cleaning a showerhead, likewise had no authorial bio, but was a less gendered

task, and thus had much more variance in estimated gender and low estimate

confidence. Furthermore, users who rated the profile with a high level of

confidence often described the task as a gendered activity (i.e., handyman versus

housekeeping) in their free-written explanation. In the cases with authorial bios

(Cases #6 and #7), participants almost unanimously accepted the authorial bio

with very high confidence.

The most frequently used cues for gender were the topic of the post (67%

of participant responses), the user avatar (39%), and the user name (31%).

Veracity estimates. Participants were asked to estimate the knowledge of the

author about the topic for the four online how-tos, as well as their confidence in

the estimates; their estimates are summarized in Table 8.

	Mean Knowledge ± (Std. Dev.)	Confidence Mean ± (Std. Dev.)
Online How-to 1: Cloth Diaper Changing	3.93 ± (0.91)	3.78 ± (0.64)
Online How-to 2: Frying Eggs	4.15 ± (0.73)	3.73 ± (0.92)
Online How-to 3: Repairing iPods	3.74 ± (0.76)	3.56 ± (0.93)
Online How-to 4: Cleaning Showerheads	3.85 ± (0.81)	3.41 ± (0.93)

Table 8: Participant estimates of knowledge and confidence for unmanipulated

online how-tos.

Online how-to articles veracity estimates and cues commentary. There is very

little variation in knowledge ratings between the four how-tos, even though they

do vary in their ability to instruct on their goals (for example, Case #5, about

changing diapers, cuts off halfway through the instructions). Similarly, there was

a great deal of poor critical thinking demonstrated by participants when rating

authors – participants often directly cited the experience of the author in Case #6,

a how-to article about frying an egg, even though her career is in writing, rather

than cooking. Even relatively outlandish propositions, like immersing an iPod in

a bowl of rice based on the advice of a drama graduate (Case #7), still had a high

veracity rating. Though some participants did cite personal or anecdotal

experience about the procedure (which does work), most participants did not,

suggesting that they did not critically consider the instructions before accepting them.

The most commonly used cues from the checklist were the accuracy of the post (69% of participant responses), the topic of the post (60%), and the author's writing style (52%).

Online dating profiles. Due to the personal nature of dating profiles, veracity ratings concern the honesty of the author, rather than the knowledge the author professes about the subject matter (though, semantically speaking, these are the same thing). In order to vary the veracity of the profiles, the first two dating profiles are sincere profiles created by actual users, and the last two dating profiles are fake profiles that do not represent their author in any way.

Online dating profiles: age estimates. Participants were asked to estimate age of the author for four different online dating profiles, as well as their confidence in the estimates; their estimates are summarized in Table 9.

	Minimum	Maximum	Mean ± (Std. Dev.)	Confidence Mean ± (Std. Dev.)
Dating Profile 1: Sincere Male Profile	20	33	26.68 ± (1.98)	4.11 ± (0.93)
Dating Profile 2: Sincere Female Profile	20	30	26.00 ± (1.64)	3.96 ± (1.06)
Dating Profile 3: Deceptive Female Profile	14	35	23.44 ± (5.42)	3.78 ± (1.01)
Dating Profile 4: Deceptive Male Profile	25	38	27.26 ± (2.96)	3.89 ± (0.97)

Table 9: Participant estimates of age and confidence for unmanipulated online

dating profiles.

Online dating profiles: age estimates & cues commentary. Many participants separately noted that the profiles stated the author's age directly, suggesting they didn't think it fell into any of the listed criteria.

For Case #9, the sincere male profile, only varied downward (nobody rated him as older than he said he was). Similarly, Case #10, the sincere female profile, had very little variation, with most dissenting participants rating the author as only slightly younger or older.

Case #11, the fake female profile, had the highest variation by far, mostly erring towards estimates younger than the author's stated age. Many participants specifically stated that it sounded like a fake profile or a joke profile based on its internal contradictions and hyperbolic tone. Other participants who did take the profile at face value said that the author sounded uneducated, and therefore younger. Note, however, that many participants still simply reported the profile's stated age. Inversely in Case #12, the fake male profile, many participants estimated the author as being older than stated, usually based on his user picture. The majority of participants still reported the author's stated age. Overall, when asked, participants seem to look first at the stated age, cross-check it against the picture and possibly their profile, and then internally check to see if they are sufficiently matching, and, if they do, accept the stated age.

The most frequently used cues by participants were the user avatar (63% of participant responses), writing style (36%), and username (29%), in addition to the stated age of the author (from the free-written answers).

Online dating profiles: gender estimates. Participants were also asked to

estimate the gender of the author for the four dating profiles, as well as their

confidence in the estimates; their estimates are summarized in Table 10.

	Sum Male Estimates	Sum Female Estimates	Confidence ± (Std. Dev.)
Dating Profile 1: Sincere Male Profile	26	1	$4.41 \pm (0.84)$
Dating Profile 2: Sincere Female Profile	1	26	$4.54 \pm (0.71)$
Dating Profile 3: Deceptive Female Profile	3	24	$3.89 \pm (1.01)$
Dating Profile 4: Deceptive Male Profile	26	1	$4.33 \pm (0.78)$

Table 10: Participant gender estimates and confidence for unmanipulated online

dating profiles.

Online dating profiles: gender estimates and cues commentary. Overall,

participants agreed with the author's explicitly stated gender and user photo, but

the fake profiles did have slightly lower confidence than the real profiles. Again,

users specifically mentioned the author's reported gender from the profile as

being a separate criterion from the ones provided in the checklist.

When the participants disagreed with the posted gender, they often noted

that the author seemed untrustworthy – for example, for Case #11, the fake female

profile, "Because the author is not serious about describing himself in a trustful

way, even though he is pretending to be a female, chances are he is a male."

The most frequently used cues were the user avatar (76% of participant

responses), user name (52%), and writing style (25%), in addition to the author's

self-reported gender.

Online dating profiles: veracity estimates. Participants were asked to estimate

how honest the author was being in their dating profile, as well as their

confidence in the estimates; their estimates are summarized in Table 11.

	Mean Honesty ± (Std. Dev.)	Confidence Mean ± (Std. Dev.)
Dating Profile 1: Sincere Male Profile	3.27 ± (0.87)	3.26 ± (0.81)
Dating Profile 2: Sincere Female Profile	3.56 ± (1.09)	3.56 ± (0.85)
Dating Profile 3: Deceptive Female Profile	2.35 ± (1.02)	3.81 ± (0.94)
Dating Profile 4: Deceptive Male Profile	3.15 ± (1.10)	3.48 ± (0.94)

Table 11: Participant honesty estimates and confidence for unmanipulated online

dating profiles.

Online dating profiles: veracity estimates and cues commentary. Honesty

ratings for the true profiles were higher than the dishonest profiles. In Case #11,

the fake female profile, users mentioned internal contradictions (such as claiming

to both have and not have drinking and smoking habits), as well as the hyperbolic

writing style. Case #12, the fake male dating profile, did not have these internal

contradictions, but rather contained very little personal detail about the author at

all. Case #12 showed the largest variation in its rated honesty – many participants

found the author to be highly honest and consistent, while others found the author

very evasive – for example, "He's definitely selling himself, and leaves out a lot of information on the side questionnaire. Car salesman vibes.".

In the cases where participants rated the sincere profiles as dishonest, participants mentioned perceived discrepancies between stated age and other aspects of the profile or a lack of personality flaws or negatives disclosed by the author.

The most frequently used cues for dating profile honesty were the accuracy of the profile (69% of participant responses), topic of the profile (60%), and the author's writing style (52%).

Study 1: discussion of overall results. The initial questionnaire provided several interesting results in addition to the cues that will later be used in Study 2.

First, participants were usually very confident in their estimates – only in two estimates was average participant confidence below 3.0. In cases where there were only subtle or implicit cues to the author's identity, participants were comparably confident to when the cues were explicit and direct (even cases as direct as directly stating the author's age and gender). This extreme confidence is consistent with previous research – Kahneman and Tversky (1973) found that participants, when asked to make appraisals of content such as student teacher performance or stock market appraisals based on relatively small or even unimportant samples of the content, participants were highly confident in the validity of their predictions if the content was representative of their estimates, which they referred to as the illusion of validity.

This illusion is particularly peculiar because participants rarely gave low ratings of author veracity – only two cases (#3, a review of a Montreal restaurant, and #11, a fake female dating profile) had average ratings below 3.0. Of particular note here are the how-to articles – though some of the how-to articles are incomplete (such as #5, about diaper-changing) or outlandish (#7, about putting an iPod into a bowl of rice), participants still rated the author as being fairly or highly knowledgeable overall. This is consistent with previous research showing the credulousness of Web users – even when Web users know the principles of information literacy online, they often do not apply them (Hogan & Varnhagen, 2013; Daniels, 2007). Since the content was apparently valid (though objectively poor), participants were willing to take the path of least resistance in their appraisals, a well-known heuristic used by online information seekers (Varnhagen, 2004).

Participants also showed other indications of poor critical analysis – for example, they often misinterpreted the start of an author's career for their birth year in Case #6, the egg-frying instruction that indirectly stated the author's age. In cases with a very direct cue, such as a photo of the author or a stated age, users often exclusively or nearly exclusively cited that cue in their estimate, often with very high confidence, even without any corroborating evidence, or even contradictory evidence. When participants were critical of an author's claims, it was often for surface factors, such as grammar, vocabulary, or tone. This is most noticeable by comparing the two fake dating profiles (Cases #11 and #12). Case #11 was very poorly written and was ranked very low in terms of author honesty,

but Case #12 was rated fairly high, even though it was also fake and provided

very little information about the imaginary dating profile author. Web users have

also been shown to use these superficial characteristics in other aspects of Web

use, such as information-seeking with a search engine (Bar-Ilan, Keenoy, Levene,

& Yaari, 2009) or when researching a school project (Walraven, Brand-Gruwel,

& Boushuizen, 2009).

   This was compounded by participants often resorting to stereotypes to

make their decisions, particularly when there was relatively little direct

information about the author. Case #1, for example, had many participants

specifically cite the author's comments about the noise levels in the hotel as

evidence that the author was older, though presumably most people, not just older

people, prefer a quiet hotel room. Stereotypes were even used when they could

have easily been attributed to either gender, for example – in Case #8, about

cleaning a showerhead, some participants suggested that cleaning advice was

associated with female authors, while household repair advice was associated

with male authors. Other researchers have noted this tendency towards

stereotyping and heuristic processing of other Web agents, even to the point of

developing computational models to represent the process (Liu, Datta, & Rzadca,

2013). Stereotypes as a basis for heuristic judgment, however, have been studied

for longer than computers have – biases of representativeness have been

thoroughly analyzed as part of behavioural modeling of judgment and biases

(Tversky & Kahneman, 1974). These biases wipe out the more credible aspects

of judgment and decision making, such as prior information about base rates (of deception and poor information, in this case).

Study 2: Experimental Manipulation of Cues

Experimental Summary

Our initial questionnaire examined what conclusions Web users draw about the authors of different Web artefacts, as well as what cues those participants believe they are using when they make those conclusions. However, previous research, including research done in our own lab, has shown that Web users often draw very wrong conclusions about what guides their appraisals of Web content (e.g., Daniels, 2007). Furthermore, as shown in our initial questionnaire, participants were frequently reaching conclusions that were wrong or poorly supported (such as arguing that a background in drama provides credibility in repairing a damaged iPod), suggesting that participants are not thinking critically about the conclusions they draw when estimating the author characteristics of Web content.

Therefore, in order to experimentally validate the findings about the cues participants suggested were the driving factors in their estimations for our initial study, our initial findings were followed up by a larger, experimental Study 2 where the factors participants in Study 1 identified important in appraising Web authors identified by the initial study were manipulated experimentally to validate their influence on participant estimation of authorial age, gender, and veracity. A new group of participants in Study 2 were sampled and given the same style of questionnaire as Study 1, but were divided between several edited versions of the

same Web artefacts from Study 1, digitally altered to change the cues Study 1

participants noted as important in their estimates of the author's age, gender, and

veracity. If the factors identified by users in the initial study actually are part of

the common methods used for identifying an author's age, gender, and veracity,

the larger study should both provide evidence for utilization of these factors as

well as their relative strengths. These changes in participant estimations of the

author's age, gender, and veracity based on the manipulations of the Web

artefacts could then be analyzed via general linear modeling (Research Question

3).

Participants & Demographics

        Study 2 was completed with 260 additional undergraduates sampled from

the Research Participation Program. The participation rules and ethical approval

are identical to the previous study. Of the 260 participants, 13 were completely

excluded due to blank or fouled submissions (n=247). The participants included

104 males and 142 females, and their demographic information is summarized in

Table 12.

	Minimum	Maximum	Mean ± (Standard Deviation)
Age	17	31	19.34 ± (2.04)
Computing Experience (years)	1	20	11.27 ± (3.01)
Computing Expertise (1-5)	1	5	3.50 ± (0.76)
Web Experience (years)	0.25	19	9.53 ± (2.91)
Web Expertise (1-5)	1	5	3.83 ± (0.75)

Table 12: Summary of participant demographics from Study 2.

Again, participants were asked to report their relative usage for different

Web tools on a Likert scale of 1-5. These demographics are summarized in Table

13.

	Never used	Used rarely	Used sometimes	Used frequently	Used constantly
Self-help/How-to	15	30	110	72	19
Online reviews	8	40	89	79	30
Online dating	202	18	14	8	3
Blogs	29	65	67	60	23
Forums	17	57	91	59	23
Online news	10	42	91	73	28
Social media	2	7	28	75	131

Table 13: Summary of participant self-reported usage of several Web tools from

Study 2.

Questionnaire Characteristics

After demographic collection, participants in Study 2 were also given a 12-

section questionnaire about 4 online reviews, 4 online how-to articles, and 4

online dating profiles, along with demographic questions. Participants were again

asked for their estimates of the author's age, the author's gender, the author's

level of knowledge or honesty on a Likert scale of 1-5, their confidence in all each

of their estimates on a Likert scale of 1-5, as well as which cues they used to

come to these estimates.

However, unlike in the initial study, participants were divided randomly

between 8 forms of the questionnaire. In each form, each of the twelve questions

was randomly assigned to a particular gender, age, and level of veracity.

Ultimately, each form had a mixture of Web artefacts that were manipulated to be

older, younger, male, female, and so on. This resulted in a 2x2x2 randomly

assigned experimental setup for each of the 12 questions, illustrated in Figure 3.

Low Veracity		High Veracity	
Young Male	Older Male	Young Male	Older Male
Young Female	Older Female	Young Female	Older Female

Figure 2: Different versions of any particular Web artefact in Study 2.

The manipulations for age, gender, and veracity were based on the responses

given by participants in Study 1 – the top 3 used cues were manipulated for age,

gender, and veracity for each artefact. These artefacts are available at

http://www.ualberta.ca/~jsaleh/v3, and the manipulations to each artefact are

listed in Appendix II.

Figure 3: Example of a manipulation of the review from Figure 1 – in this case,

for a younger, male, and knowledgeable author.

As in the first study, participants were presented with the 12 Web artefacts, then filled in their personal estimates of the author's age, gender, and veracity, as well as the cues they used and the confidence they had in their responses.

After all participants had completed the study, the data was collected and coded for the following analyses:

- Participant estimates and confidence in estimates based on the age, gender, and veracity manipulations, as well as any potential interactions between the three manipulations

- Any potential influence of demographic characteristics on participant estimates or sensitivity to the manipulations

Regression analyses were all completed using the general linear model in SPSS 19.0 to calculate significance and effect size, except for the usage of correlations to do demographic analyses.

The first goal of Study 2 was to attempt to quantify the exact manipulations that are effective in changing participants' perceptions of an author as a particular age, gender, or level of veracity in order to infer the heuristics that participants are using in order to make these judgments. Though these heuristics are interesting in their own right, they are more interesting in their failures – previous research has indicated that participants often indicate they use critical thinking and information literacy skills in order to reach their conclusions, but that their intentions do not play out when actually given an information literacy task. Where our manipulations fail, particularly when participants are asked to determine the veracity of a particular Web artefact, participants are basing their

judgments off of entirely different criteria than what they *believe* they are using

(or, at least, are willing to state they believe they are using). In other worse, these

falsely identified criteria show where participants' self-appraisal of their Web

browsing skills and procedures diverge from the reality of their actual appraisals.

Results & Discussion

Demographic analyses. Our initial demographic analysis was to test the

relationship between general Web media experience and its influence on

participant confidence in their estimates. Participants' self-reported computing

experience and self-reported Web experience (in years spent using these tools)

had no particular relationship with their confidence in their responses. However,

self-reported expertise in computing and the Web was correlated with higher

average confidence across all cases except computing experience and confidence

in estimating the gender of a how-to article. These correlations are summarized in

Table 14.

R	Age Rating Confidence	Gender Rating Confidence	Veracity Rating Confidence
Computing Experience (years)	$r(245)=0.10$	$r(245)=0.06$	$r(245)=0.05$
Computing Expertise (1-5)	$r(244)=0.28$	$r(244)=0.14$	$r(244)=0.26$
Web Experience (years)	$r(243)=0.13$	$r(243)=0.13$	$r(243)=0.08$
Web Expertise (1-5)	$r(245)=0.32$	$r(245)=0.22$	$r(245)=0.27$

Table 14: Correlations of demographic computing use and Web use on

participant confidence in their estimates. All bolded correlations are significant

below p=0.01.

To further analyze the relationship between Web media and participant confidence, we then analyzed the relationship between participant experience with particular forms of Web media and its effect on participant confidence when making estimates about that media. Generally speaking, media-specific experience with particular forms of Web media did not have any more of an effect on a participant's confidence in their estimates than did general computing experience, except for a minor relationship between online review usage and participants rating the age of an online review's author (Table 15). This is similar to our findings from Study 1.

R	Age Rating Confidence	Gender Rating Confidence	Veracity Rating Confidence
Review Usage (1-5)	*r*(246)=0.20	*r*(245)=0.16	*r*(245)=0.13
How-to Usage (1-5)	*r*(246)=-0.02	*r*(246)=0.01	*r*(246)=0.05
Online Dating Usage (1-5)	*r*(243)=-0.10	*r*(243)=-0.03	*r*(243)=-0.14

Table 15: Correlations of participant confidence about their estimates of an author's age, gender, and veracity with the participant's experience with the media the author used. Bolded correlations are significant below p=0.01.

Online reviews: age manipulations. Based on our findings from Study 1, the age manipulations for online reviews were to the style of the post, the user avatar of the author, and the vocabulary of the author. The effects of these manipulations on participant estimates of the author's age, as well as effects of the manipulations targeted towards gender and veracity for each question, are summarized in Table 16.

Manipulation Tested (Effect Size)	Age	Gender	Veracity	Age * Gender	Age * Veracity	Gender * Veracity	Three-way Interaction
Online Review 1: Chicago Hotel	**$F_{(1, 241)}=40.1$ $\eta^2=0.17$**	$F_{(1, 241)}=4.2$, $\eta^2=0.02$	$F_{(1, 241)}=0.01$, $\eta^2<0.01$	$F_{(1, 241)}=2.94$, $\eta^2<0.01$	$F_{(1, 241)}=0.1$, $\eta^2<0.01$	$F_{(1, 241)}=1.2$, $\eta^2<0.01$	$F_{(1, 241)}<0.01$, $\eta^2<0.01$
Online Review 2: Edmonton Diner	**$F_{(1, 241)}=752.2$, $\eta^2=0.76$**	$F_{(1, 241)}=2.9$, $\eta^2=0.01$	$F_{(1, 241)}=2.6$, $\eta^2=0.01$	$F_{(1, 241)}=2.4$, $\eta^2=0.01$	$F_{(1, 241)}=1.8$, $\eta^2<0.01$	$F_{(1, 241)}=2.3$, $\eta^2=0.01$	$F_{(1, 241)}=1.7$, $\eta^2<0.01$
Online Review 3: Montreal Restaurant	**$F_{(1, 239)}=159.8$, $\eta^2=0.40$**	$F_{(1, 239)}=0.2$, $\eta^2<0.01$	$F_{(1, 239)}=0.1$, $\eta^2<0.01$	**$F_{(1, 239)}=9.5$, $\eta^2=0.03$**	$F_{(1, 239)}=0.2$, $\eta^2<0.01$	$F_{(1, 239)}=0.8$, $\eta^2<0.01$	$F_{(1, 239)}=1.6$, $\eta^2<0.01$
Online Review 4: Penticton Pub	**$F_{(1, 237)}=29.5$, $\eta^2=0.11$**	$F_{(1, 237)}=5.4$, $\eta^2=0.02$	$F_{(1, 237)}=0.1$, $\eta^2<0.01$	**$F_{(1, 237)}=43.4$, $\eta^2=0.15$**	**$F_{(1, 237)}=17.6$, $\eta^2=0.07$**	$F_{(1, 237)}=2.3$, $\eta^2=0.01$	**$F_{(1, 237)}=17.5$, $\eta^2=0.07$**

Table 16: Summary of general linear modeling for manipulation effects on participant estimates of an online review author's age. Bolded tests are significant below p=0.01.

The age manipulation had a significant effect on all four reviews. However, the effect was much more powerful for Review #2 and Review #3, which both had picture's of the author's face. The average effect of these manipulations is illustrated in Figure 4.
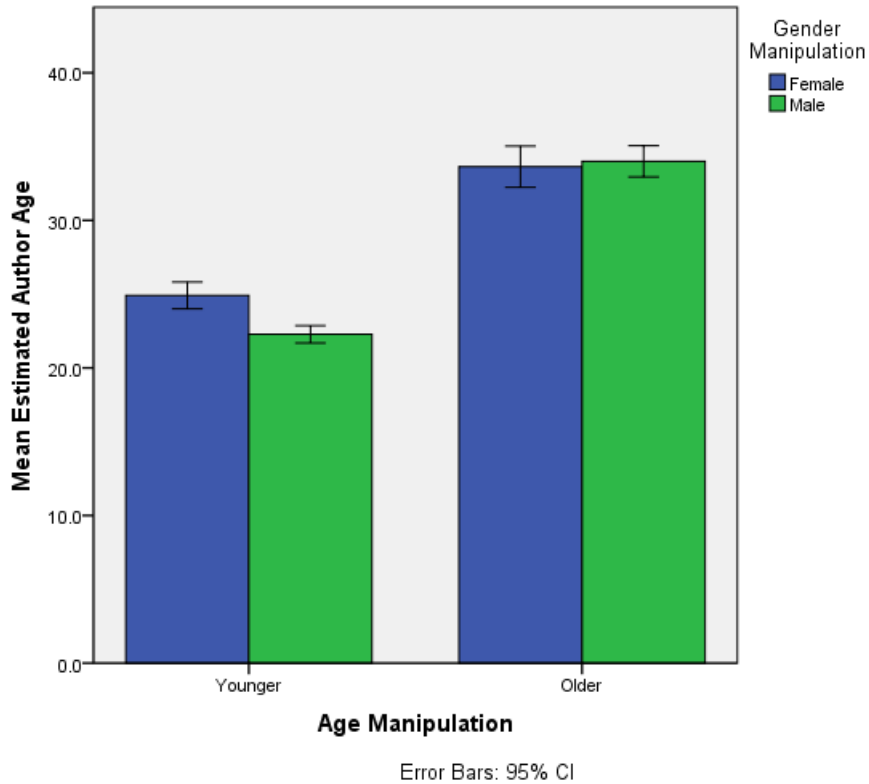
Figure 4: Bar graph illustrating average effects of age and gender manipulations

on participant estimates of author age for online reviews.

The age manipulation was still the most powerful effect for all reviews except

Review #4, a review for a Penticton pub, where the age manipulation was only

successful for male authors, not the female authors. This particular case is

illustrated in Figure 5. Based on user responses in the free-written section, many

participants cited the author's user avatar as a reason for ranking the older female

authored reviews as by a younger author, suggesting the manipulation of the user

avatar (using a female puppet from a modern TV show versus a female puppet

from classic TV) was not strong enough to differentiate the author's age. This

was not the case for the male authors – the two puppets used for the young male

and older male author were demonstrably effective.
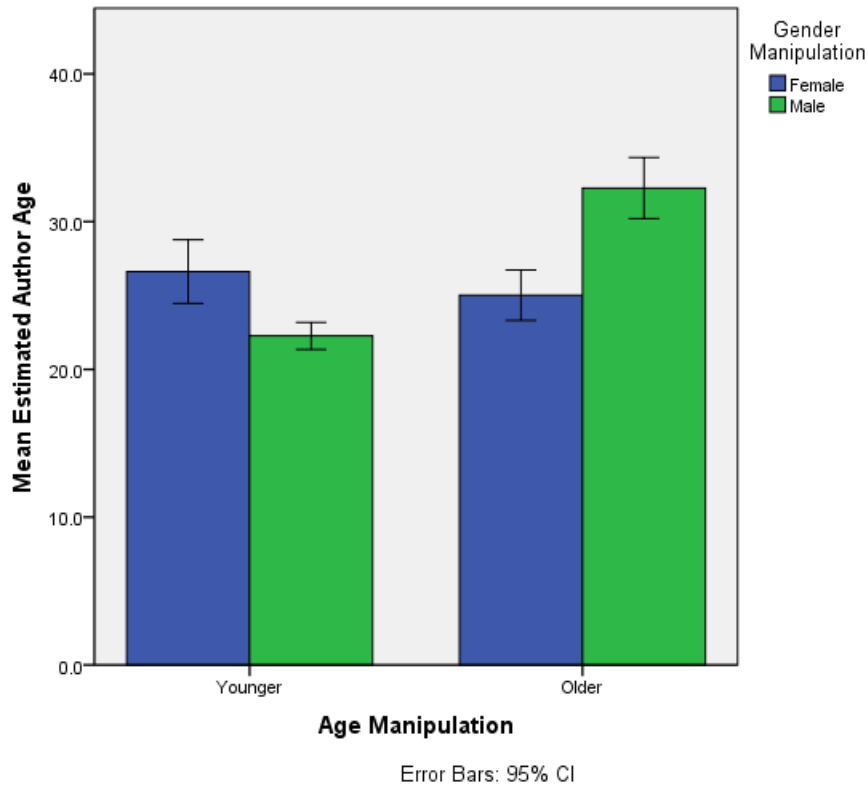
Figure 5: Bar graph illustrating the separate manipulation effects on age

estimates for Case #4.

The manipulations did not have a notable effect on user confidence. Users

generally had high confidence in their age estimates in all the estimates they

made, regardless of manipulation (Figure 6).
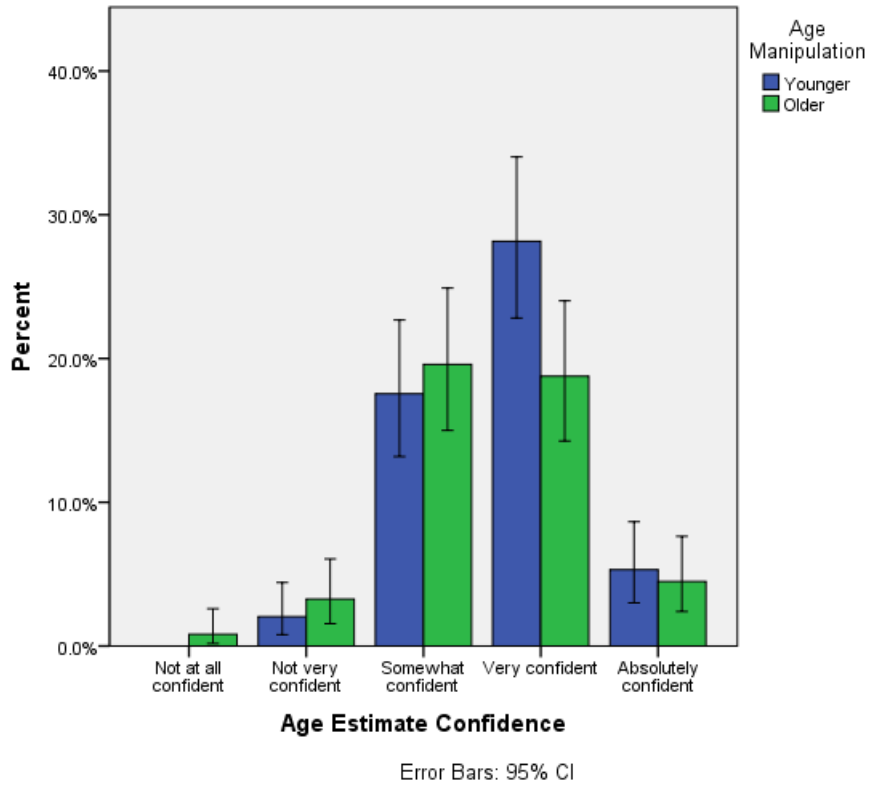
Figure 6: Bar graph illustrating average participant confidence in their estimates

of the age of the author of an online review.

Online reviews: gender manipulations. The gender manipulations for online

reviews, based on our Study 1 findings, were to the username, user avatar, and

writing style of the review. The analysis of the manipulations is summarized in

Table 17.

Manipulation Tested (Effect Size)	Age	Gender	Veracity	Age * Gender	Age * Veracity	Gender * Veracity	Three-way Interaction
Online Review 1: Chicago Hotel	**$F_{(1, 241)}=7.1$ $\eta^2=0.03$**	**$F_{(1, 241)}=88.8$ $\eta^2=0.27$**	$F_{(1, 241)}=2.6$, $\eta^2<0.01$	$F_{(1, 241)}=6.5$, $\eta^2=0.02$	$F_{(1, 241)}=2.9$, $\eta^2<0.01$	$F_{(1, 241)}=1.2$, $\eta^2<0.01$	$F_{(1, 241)}=1.2$, $\eta^2<0.01$
Online Review 2: Edmonton Diner	$F_{(1, 241)}=5.7$, $\eta^2=0.02$	**$F_{(1, 241)}=526.6$, $\eta^2=0.69$**	**$F_{(1, 241)}=8.7$, $\eta^2=0.03$**	$F_{(1, 241)}=5.3$, $\eta^2=0.02$	$F_{(1, 241)}=6.2$, $\eta^2=0.02$	$F_{(1, 241)}=2.3$, $\eta^2=0.01$	$F_{(1, 241)}=1.7$, $\eta^2<0.01$
Online Review 3: Montreal Restaurant	**$F_{(1, 236)}=45.8$, $\eta^2=0.16$**	**$F_{(1, 236)}=719.0$, $\eta^2=0.75$**	$F_{(1, 236)}=6.47$, $\eta^2=0.02$	**$F_{(1, 236)}=9.3$, $\eta^2=0.03$**	$F_{(1, 236)}=6.6$, $\eta^2=0.02$	$F_{(1, 236)}=7.7$, $\eta^2=0.03$	$F_{(1, 236)}=6.8$, $\eta^2=0.02$
Online Review 4: Penticton Pub	**$F_{(1, 235)}=1964.8$, $\eta^2=0.89$**	**$F_{(1, 235)}=1773.2$, $\eta^2=0.88$**	$F_{(1, 235)}=1.3$, $\eta^2<0.01$	$F_{(1, 235)}=1.3$, $\eta^2<0.01$	$F_{(1, 235)}=1.7$, $\eta^2<0.01$	$F_{(1, 235)}=1.4$, $\eta^2<0.01$	$F_{(1, 235)}=1.2$, $\eta^2<0.01$

Table 17: Summary of general linear modeling for manipulation effects on participant estimates of an online review author's gender. Bolded tests are significant below p=0.01.

The manipulation was very effective at changing participant perceptions of the author's gender in all of the reviews. A second, weaker main effect in several of the reviews also occurred; younger authors were more likely to be estimated as male versus older authors, who were estimated as female more often (Figure 7).
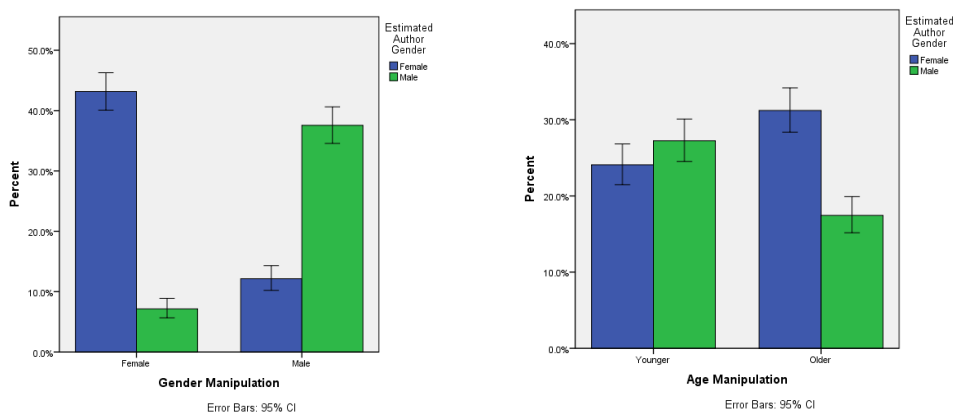
Figure 7. Bar graphs showing the effects of the gender and age manipulations on participant estimates of author's gender for online reviews.

Unlike with age, this relationship was similar for all individual cases. The secondary effect of the age manipulation was most noticeable in Case #2 (review of an Edmonton eatery.) The participants who rated the male-author manipulated posts as female often cited the writing style – even participants who did estimate the author as male commented, for example, "If I were to have read it based on the review alone without the picture I would have suspected it was a female because of the detail and vocabulary." Confidence was still very high for participants overall (Figure 8), with a mean confidence of 4.37 for females versus 4.06 for males.
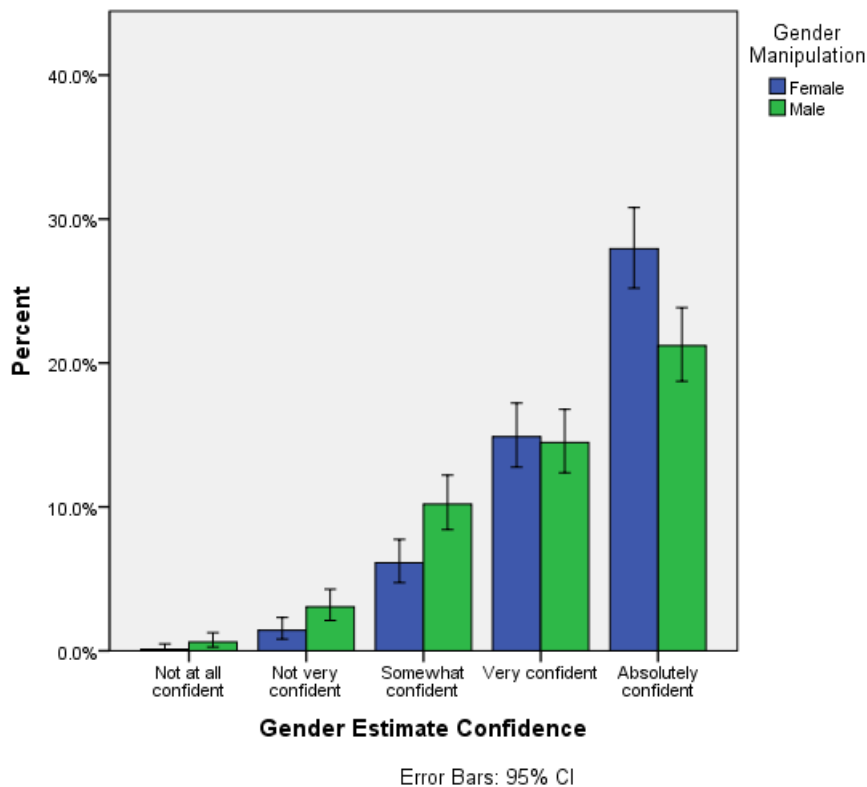
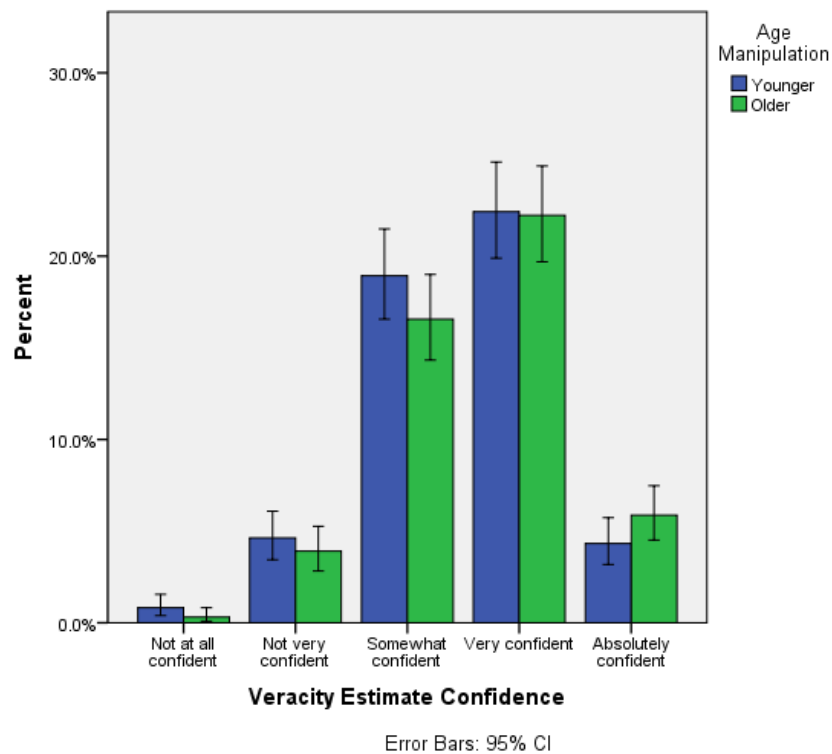*Figure 8: Bar graph showing relative participant confidence in estimates of the gender of an author of an online review.*

Online reviews: veracity manipulations. The veracity manipulations used for

the online reviews, based on Study 1, were to the writing style, accuracy of the

post, and the topic of the post. The effect all manipulations on participant

perceptions of the author's knowledge is summarized in Table 18.

Manipulation Tested (Effect Size)	Age	Gender	Veracity	Age * Gender	Age * Veracity	Gender * Veracity	Three-way Interaction
Online Review 1: Chicago Hotel	**$F(1, 241)=10.9$ $\eta^2=0.04$**	$F(1, 241)=0.1$, $\eta^2<0.01$	$F(1, 241)=0.1$, $\eta^2<0.01$	$F(1, 241)=10.1$, $\eta^2=0.04$	$F(1, 241)=3.7$, $\eta^2<0.01$	$F(1, 241)=3.6$, $\eta^2<0.01$	$F(1, 241)=3.2$, $\eta^2<0.01$
Online Review 2: Edmonton Diner	$F(1, 239)=3.2$, $\eta^2=0.02$	$F(1, 239)=1.3$, $\eta^2<0.01$	$F(1, 239)=0.02$, $\eta^2<0.01$	$F(1, 239)=0.1$, $\eta^2<0.02$	$F(1, 239)=0.4$, $\eta^2<0.01$	$F(1, 239)=0.2$, $\eta^2<0.01$	$F(1, 239)=0.5$, $\eta^2<0.01$
Online Review 3: Montreal Restaurant	**$F(1, 239)=17.1$, $\eta^2=0.7$**	$F(1, 239)=2.7$, $\eta^2=0.1$	$F(1, 239)=3.9$, $\eta^2=0.02$	$F(1, 239)=3.9$, $\eta^2=0.02$	$F(1, 239)=0.7$, $\eta^2<0.01$	$F(1, 239)=0.2$, $\eta^2<0.01$	$F(1, 239)=7.3$, $\eta^2=0.03$
Online Review 4: Penticton Pub	$F(1, 237)=0.3$, $\eta^2<0.01$	$F(1, 237)=0.7$, $\eta^2<0.01$	**$F(1, 237)=11.2$, $\eta^2=0.05$**	$F(1, 237)<0.1$, $\eta^2<0.01$	$F(1, 237)=1.9$, $\eta^2<0.01$	$F(1, 237)=0.8$, $\eta^2<0.01$	$F(1, 237)=1.2$, $\eta^2<0.01$

Table 18: Summary of general linear modeling for manipulation effects on

participant estimates of an online review author's knowledge of the topic. Bolded

tests are significant below p=0.01.

The veracity manipulations alone did not have a strong effect on user's

estimates of the author's knowledge of the topic – on a question-by-question

basis, the knowledge manipulation was only even nominally effective at changing

participants' estimates of the author's knowledge in Case #3, a review of a

Montreal restaurant ($F(1, 239)=3.88$, $p=0.05$, $\eta^2=0.02$), and Case #4, a review of a

Penticton pub ($F(1, 237)=11.23$, $p<0.001$, $\eta^2=0.05$).

In addition, the age manipulation changed participant estimates of author

knowledge on Case #2, a review of an Edmonton restaurant ($F(1, 239)=3.25$,

$p=0.02$, $\eta^2=0.02$) and Case #3, the Montreal restaurant review ($F(1, 239)=17.06$,

p<0.01, η^2=0.07). In the third case, the age manipulation was actually *more*

effective than the knowledge manipulation at changing participants' views of the

author's knowledge. Comments by participants on Cases #2 and #3 often

mentioned the author's grammar, vocabulary, and use of colloquialisms such as

emoticons or Web shorthand – the language manipulations used to indicate

younger or older authors. Similarly, the manipulation for older authors inspired

slightly higher participant confidence in their estimates, though estimate

confidence was still very high for all groups (m=3.49 for younger authors,

m=3.60 for older authors – see Figure 9).

Figure 9: Bar graph showing relative participant confidence in estimates of the

knowledge of an author of an online review.

Online review articles: experimental commentary & discussion. Overall, the

manipulations for online reviews were very effective at changing perceptions of

the author's age or gender, but changing perceptions of the author's knowledge

was surprisingly difficult. Changing the vocabulary, topic, and accuracy of the

review, was apparently not an effective method for making several of the online

reviews seem unknowledgeable to participants, suggesting that participants either

mistakenly identified these cues as the basis for their appraisals of the author's

knowledge or that they are not using these cues to the degree that they believe

they are. The latter conclusion is supported by previous research done in our lab

(e.g., Daniels, 2007; McFall, 2009) – participants in other information literacy

studies often identify the factors they *should* be considering as part of critically

appraising Web content, but often do not actually *apply* those considerations.

Online how to articles: Age manipulations. The age manipulations used for

online how-to articles, based on our findings in Study 1, were to the topic of the

post, the user avatar of the author, and the style of the post. Note that user avatar

manipulations were not possible for two of the original artefacts (having no user

avatar). The effects of these manipulations, as well as the other manipulations,

are summarized in Table 19.

Manipulation Tested (Effect Size)	Age	Gender	Veracity	Age * Gender	Age * Veracity	Gender * Veracity	Three-way Interaction
Online How-to 1: Cloth Diaper Changing	**F(1, 240)=6.5 η^2=0.03**	F(1, 240)=0.3, η^2<0.01	F(1, 240)=3.7, η^2=0.02	F(1, 240)=0.3, η^2<0.01	F(1, 240)=2.0, η^2<0.01	F(1, 240)=0.1, η^2<0.01	F(1, 240)=0.1, η^2<0.01
Online How-to 2: Frying Eggs	**F(1, 236)=51.2, η^2=0.18**	**F(1, 236)=46.3, η^2=0.16**	F(1, 236)=1.4, η^2<0.01	F(1, 236)=2.6, η^2<0.01	F(1, 236)=0.2, η^2<0.01	F(1, 236)=1.2, η^2<0.01	F(1, 236)=1.3, η^2<0.01
Online How-to 3: Repairing iPods	**F(1, 238)= 279.1, η^2=0.54**	**F(1, 238)= 44.0, η^2=0.16**	F(1, 238)=0.1, η^2<0.01	**F(1, 238)= 73.8, η^2=0.24**	F(1, 238)= 0.6, η^2<0.01	F(1, 238)= 0.7, η^2<0.01	F(1, 238)= 3.2, η^2<0.01
Online How-to 4: Cleaning Showerheads	F(1, 227)=1.9, η^2<0.01	F(1, 227)=0.6, η^2<0.01	F(1, 227)=0.9, η^2<0.01	F(1, 227)=2.3, η^2<0.01	F(1, 227)=0.7, η^2<0.01	F(1, 227)=1.2, η^2<0.01	F(1, 227)=8.2, η^2<0.01

Table 19: Summary of general linear modeling for manipulation effects on participant estimates of an online how-to author's age. Bolded tests are significant below p=0.01.

The manipulations were effective for 3 out of the 4 online how-tos, but only strongly effective in the cases with explicit author profiles: the online how-to about frying eggs and the online how-to about repairing iPods. Less direct manipulations, such as manipulating the context of the website (e.g., ads, host site) or other implicit indicators of age (e.g., talking about home ownership or parenthood) were less effective or ineffective at changing participant estimates of authorial age.

There was also a notable secondary effect in the third how-to article for the younger authors – the male author was rated as younger than the female author, seemingly due to their user picture (though the photos were of two people of similar age). This particular case is the cause of the slight difference in the average age of participant estimates for younger authors visible in Figure 10.
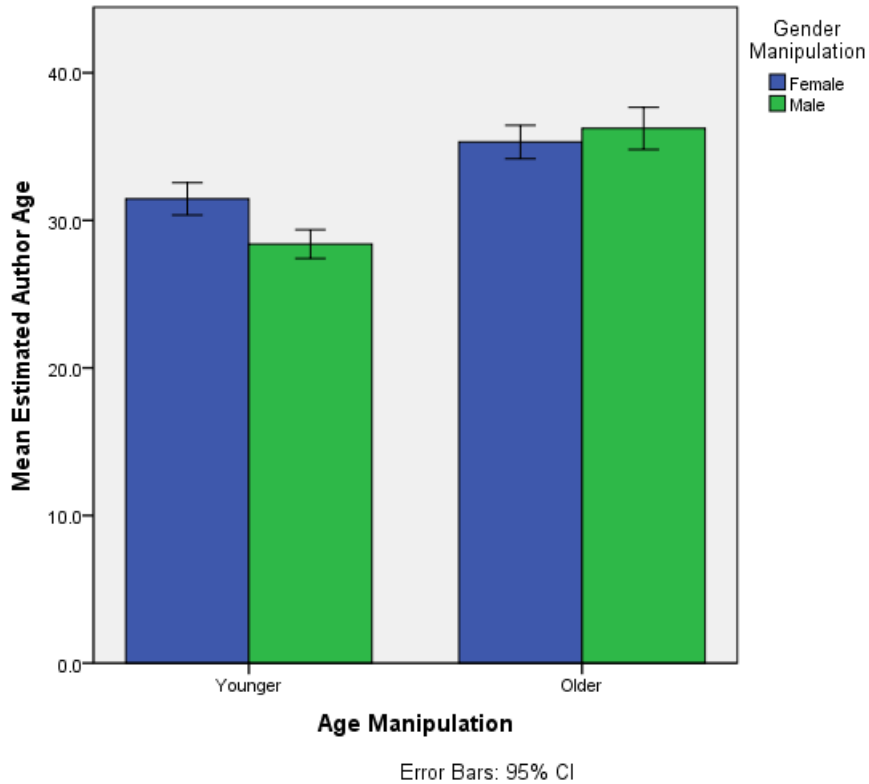
Figure 10: Bar graph showing the average effect of the age and gender

manipulations on estimated age for how-to articles.

However, participants were equally confident in their responses for all groups – no manipulation had an impact on participant confidence in their age estimates, with high confidence overall (m=3.39).

Online how to articles: gender manipulations. The gender manipulations for the online how-to articles consisted of the author's writing style, the accuracy of the post, and the topic of the post. The effects of these manipulations on gender are summarized in Table 20.

Manipulation Tested (Effect Size)	Age	Gender	Veracity	Age * Gender	Age * Veracity	Gender * Veracity	Three-way Interaction
Online How-to 1: Cloth Diaper Changing	**F(1, 239)=19.2 η²=0.07**	**F(1, 239)=207.4, η²<0.47**	F(1, 239)=0.6, η²<0.01	**F(1, 239)=15.6, η²=0.06**	F(1, 239)=0.1, η²<0.01	F(1, 239)=0.1, η²<0.01	F(1, 239)=0.1, η²<0.01
Online How-to 2: Frying Eggs	F(1, 238)=0.1, η²=0.18	**F(1, 238)=1452.1, η²=0.86**	F(1, 238)=0.1, η²<0.01	F(1, 238)=2.6, η²<0.01	F(1, 238)=0.3, η²<0.01	F(1, 238)=1.6, η²<0.01	F(1, 238)=1.9, η²<0.01
Online How-to 3: Repairing iPods	F(1, 238)= 1.5, η²=0.01	**F(1, 238)= 435.0, η²=0.65**	F(1, 238)=0.6, η²<0.01	F(1, 238)= 2.7, η²=0.24	F(1, 238)= 4.1, η²=.02	F(1, 238)= 0.7, η²<0.01	F(1, 238)= 2.5, η²=0.01
Online How-to 4: Cleaning Showerheads	F(1, 226)=0.8, η²<0.01	F(1, 226)=0.9, η²<0.01	F(1, 226)=0.1, η²<0.01	F(1, 226)=0.8, η²<0.01	F(1, 226)=0.1, η²<0.01	F(1, 226)=0.3, η²<0.01	F(1, 226)=0.5, η²<0.01

Table 20: Summary of general linear modeling for manipulation effects on participant estimates of an online how-to author's gender. Bolded tests are significant below p=0.01.

The gender manipulations were generally very effective, particularly the cases with explicit gender cues (such as a picture of the author or the author's full name). The case about changing diapers did not contain these explicit cues, but did contain gendered language (such as referring to a wife or husband), which was likewise effective at changing participant estimates of the author's gender. This particular case also had two other significant effects – younger authors were also rated as female more often, and a secondary interactive effect between age and gender that showed that the younger male profiles were specifically mistaken as female more often. The language used for the younger author may have been less indicative of gender than speaking about spouses was for older authors, which may have been further compounded by stereotypes about mothers (or other women) and diaper changing.

The gender manipulations were not effective, however, for the final how-to article about unclogging a showerhead. The gender manipulations for this case were all implicit cues, such as changing the advertisements and host Web site – these cues do not appear to have been strong enough to affect participant's perception of the author's gender on their own.

However, as with the age manipulations, participants were equally confident in their responses for all groups, with high confidence overall (m=3.98).

Online how to articles: veracity manipulations. The manipulations for veracity in online how-to articles were to their writing style, topic, and accuracy. The effect of the experimental manipulations on participant ratings of the author's how-to knowledge is summarized in Table 21.

Manipulation Tested (Effect Size)	Age	Gender	Veracity	Age * Gender	Age * Veracity	Gender * Veracity	Three-way Interaction
Online How-to 1: Cloth Diaper Changing	$F_{(1, 237)}=2.5$ $\eta^2=0.02$	$F_{(1, 237)}=0.2$ $\eta^2<0.47$	**$F_{(1, 237)}=8.2,$ $\eta^2<0.01$**	$F_{(1, 237)}=1.1,$ $\eta^2=0.03$	$F_{(1, 237)}=0.8,$ $\eta^2<0.01$	$F_{(1, 237)}<0.1,$ $\eta^2<0.01$	$F_{(1, 237)}=0.3,$ $\eta^2<0.01$
Online How-to 2: Frying Eggs	$F_{(1, 236)}=0.4,$ $\eta^2=0.18$	$F_{(1, 236)}=3.0,$ $\eta^2=0.01$	$F_{(1, 236)}=2.9,$ $\eta^2=0.01$	$F_{(1, 236)}<0.1,$ $\eta^2<0.01$	$F_{(1, 236)}=0.2,$ $\eta^2<0.01$	$F_{(1, 236)}=0.5,$ $\eta^2<0.01$	$F_{(1, 236)}=0.4,$ $\eta^2<0.01$
Online How-to 3: Repairing iPods	$F_{(1, 237)}=0.1, \eta^2=0.01$	$F_{(1, 237)}=2.0,$ $\eta^2=0.01$	**$F_{(1, 237)}=9.8,$ $\eta^2=0.04$**	$F_{(1, 237)}=1.1,$ $\eta^2<0.01$	$F_{(1, 237)}=4.0,$ $\eta^2=0.02$	$F_{(1, 237)}=0.5, \eta^2<0.01$	$F_{(1, 237)}=0.7, \eta^2=0.01$
Online How-to 4: Cleaning Showerheads	$F_{(1, 231)}=1.1,$ $\eta^2<0.01$	$F_{(1, 231)}=0.8,$ $\eta^2<0.01$	$F_{(1, 231)}=1.3,$ $\eta^2<0.01$	$F_{(1, 231)}=2.1,$ $\eta^2<0.01$	$F_{(1, 231)}=0.1,$ $\eta^2<0.01$	$F_{(1, 231)}<0.01,$ $\eta^2<0.01$	$F_{(1, 2331)}=0.01,$ $\eta^2<0.01$

Table 21: Summary of general linear modeling for manipulation effects on participant estimates of an online how-to author's knowledge of the topic. Bolded tests are significant below p=0.01.

These manipulations were only mildly successful at adjusting participant estimates of the author's knowledge for the articles about frying eggs and

repairing iPods, with no other effects from any other manipulation. Note,

however, that the unknowledgeable author was still rated fairly well (Figure 10).

Participants in both groups were also both very confident in their estimates

(m=3.87 for high-knowledge authors, m=3.72 for low-knowledge authors).
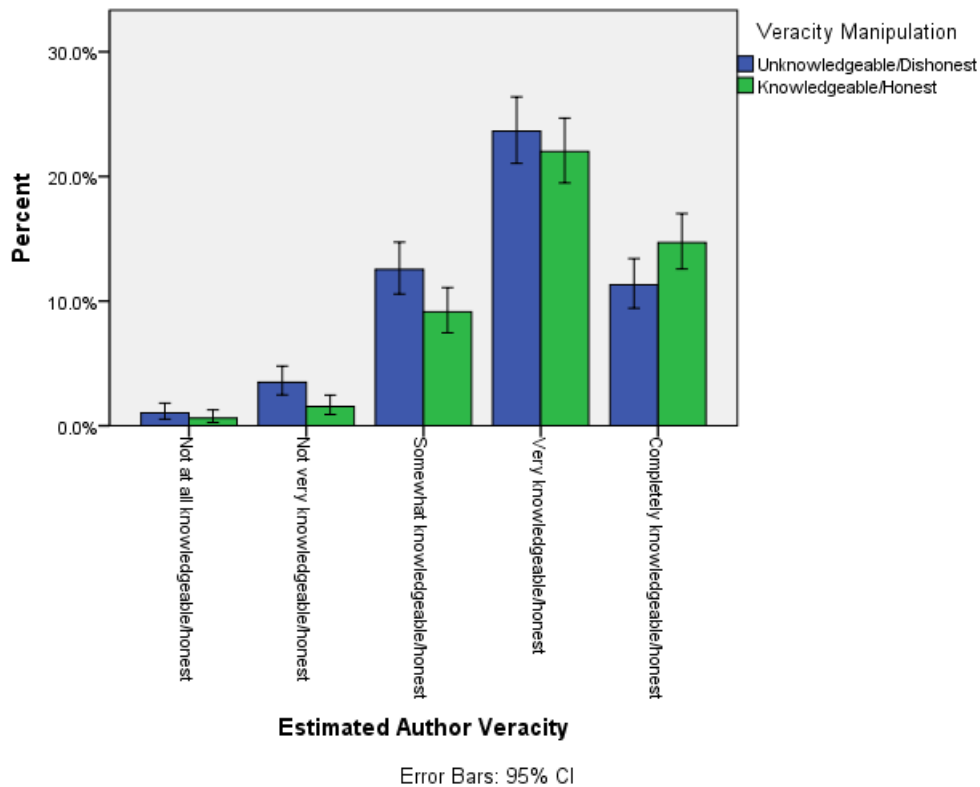
Figure 11: Average effects of manipulating veracity cues on participant estimates

of knowledge for online how-to authors.

Online how-to articles: experimental commentary & discussion. In the case of

online how-to articles, our study found a similar pattern to what we found for

online reviews. Changing participants' perceptions of age and gender was

relatively easy, though more difficult to do through implicit or stereotypical cues

such as the diaper-changing instructions in Case #5 or the showerhead cleaning in

Case #8. Unlike in the online reviews, the veracity manipulation did have an

overall effect on participant estimates of authorial knowledge about the how-to

article's topic, but the manipulation's strength was low – participants still rated

the unknowledgeable authors as being fairly knowledgeable. This continues the

pattern of superficial critical analysis by participants on authorial knowledge that

was suggested by the results of the online review estimates.

Online dating profiles. As in the original questionnaire from Study 1, the first

two profiles are edits of originally sincere dating profiles, while the second two

profiles are edits of originally insincere dating profiles. Manipulations were

targeted to increase estimated honesty for the dishonest profiles in their honest

versions, and vice versa for the honest profiles.

Online dating profiles: age manipulations. The most frequently used cues by

participants in Study 1 for age in online dating profiles were the user avatar,

writing style, and username, in addition to the stated age of the author (from the

free-written answers). Note, however, that the stated age of the author was also

manipulated as part of the honesty manipulation, inverting the age to match the

honest profile (e.g., the older dishonest male and the younger honest male claimed

the same age, while the younger dishonest male and the older honest male would

have the same stated age, and so on.). As mentioned in the literature, lying about

age is one of the most common deceptions in online dating (e.g., Schlitz et al,

2012) – thus, lying about age in the dating profiles is an important part of the

experiment's validity, though it does complicate the analyses. If participants

accept all stated ages without any skepticism, there should be a single interaction

effect between age and honesty with no main effects; if participants are perfectly

skeptical and see completely through the deception, there should be a single main

effect for age and no interaction nor honesty main effect; a mix of main and

interaction effects indicates partial compensation for dishonesty. The resulting

analysis can be found in Table 22.

Manipulation Tested (Effect Size)	Age	Gender	Veracity	Age * Gender	Age * Veracity	Gender * Veracity	Three-way Interaction
Dating Profile 1: Sincere Male Profile	**F(1, 233)=365.6, η^2=0.61**	F(1, 233)=0.3, η^2<0.01	**F(1, 233)=56.8, η^2=0.20**	F(1, 233)=1.1, η^2<0.01	**F(1, 233)=57.4, η^2=0.20**	F(1, 233)=0.1, η^2=0.02	F(1, 233)=0.1, η^2=0.02
Dating Profile 2: Sincere Female Profile	**F(1, 233)=182.1, η^2=0.43**	F(1, 233)=2.4, η^2=0.01	**F(1, 233)=35.6, η^2=0.13**	F(1, 233)=8.4, η^2=0.04	**F(1, 233)=10.5, η^2=0.04**	F(1, 233)=1.2, η^2=0.06	F(1, 233)=1.3, η^2<0.01
Dating Profile 3: Deceptive Female Profile	**F(1, 233)= 197.9, η^2=0.46**	F(1, 233)= 2.9, η^2=0.01	F(1, 233)=3.2, η^2=0.01	F(1, 233)= 1.5, η^2<0.01	F(1, 233)= 1.6, η^2<0.01	F(1, 233)= 1.3, η^2<0.01	F(1, 233)= 0.1, η^2<0.01
Dating Profile 4: Deceptive Male Profile	**F(1, 232)=236.7, η^2=0.51**	F(1, 232)=1.0, η^2<0.01	**F(1, 232)=50.6, η^2=0.18**	F(1, 232)=1.5, η^2<0.01	**F(1, 232)=53.0, η^2=0.19**	F(1, 232)=0.4, η^2<0.01	F(1, 232)=0.9, η^2<0.01

Table 22: Summary of general linear modeling for manipulation effects on

participant estimates of an online dating profile author's age. Bolded tests are

significant below p=0.01.

Participants were somewhat critical of the stated age of the author,

significantly adjusting their age estimates, particularly by estimating dishonest

older authors as older than the author's given age. This skepticism was by no

means perfect, since an older author lying about his or her age was still rated as

much younger than an honest older author. Furthermore, all participants

responded with very high confidence in their estimates (m=4.09), with no change

in confidence based on the age or honesty of the author.

Online dating profiles: gender manipulations. The most frequently used cues

that were manipulated for dating profiles were the user avatar, user name, and

writing style (in addition to stated gender). The effects of these manipulations are

summarized in Table 23.

Manipulation Tested (Effect Size)	Age	Gender	Veracity	Age * Gender	Age * Veracity	Gender * Veracity	Three-way Interaction
Dating Profile 1: Sincere Male Profile	$F_{(1, 233)}=0.7$, $\eta^2<0.01$	**$F_{(1, 233)}=4435.6$, $\eta^2=0.95$**	$F_{(1, 233)}=3.8$, $\eta^2=0.02$	$F_{(1, 233)}=0.1$, $\eta^2<0.01$	$F_{(1, 233)}=0.1$, $\eta^2<0.01$	$F_{(1, 233)}=0.6$, $\eta^2<0.01$	$F_{(1, 233)}=0.7$, $\eta^2<0.01$
Dating Profile 2: Sincere Female Profile	$F_{(1, 233)}=0.9$, $\eta^2<0.01$	**$F_{(1, 233)}=2532.3$, $\eta^2=0.91$**	$F_{(1, 233)}=1.0$, $\eta^2<0.01$	$F_{(1, 233)}=2.0$, $\eta^2<0.01$	$F_{(1, 233)}=0.1$, $\eta^2<0.01$	$F_{(1, 233)}=0.1$, $\eta^2<0.01$	$F_{(1, 233)}=1.0$, $\eta^2<0.01$
Dating Profile 3: Deceptive Female Profile	$F_{(1, 233)}=0.1$, $\eta^2<0.01$	**$F_{(1, 233)}=1366.6$, $\eta^2=0.86$**	$F_{(1, 233)}=1.0$, $\eta^2<0.01$	$F_{(1, 233)}=0.2$, $\eta^2<0.01$	$F_{(1, 233)}=0.3$, $\eta^2<0.01$	$F_{(1, 233)}=2.3$, $\eta^2<0.01$	$F_{(1, 233)}=0.1$, $\eta^2<0.01$
Dating Profile 4: Deceptive Male Profile	$F_{(1, 233)}=0.5$, $\eta^2<0.01$	**$F_{(1, 233)}=3300.5$, $\eta^2<0.93$**	$F_{(1, 233)}=0.8$, $\eta^2<0.01$	$F_{(1, 233)}=0.8$, $\eta^2<0.01$	$F_{(1, 233)}=3.0$, $\eta^2=0.01$	$F_{(1, 233)}=0.5$, $\eta^2<0.01$	$F_{(1, 233)}=0.5$, $\eta^2<0.01$

Table 23: Summary of general linear modeling for manipulation effects on participant estimates of an online dating profile author's gender. Bolded tests are significant below p=0.01.

Participants overwhelmingly reported the author's claimed gender as the

author's actual gender (Figure 12). None of the manipulations, including the

deceptive profiles originally used in Study 1, were significantly rated as having

been written by the opposite gender the author stated. More specifically, none of

the veracity manipulations meant to make the author seem more honest or

dishonest had any impact on participant ratings of the author's gender.
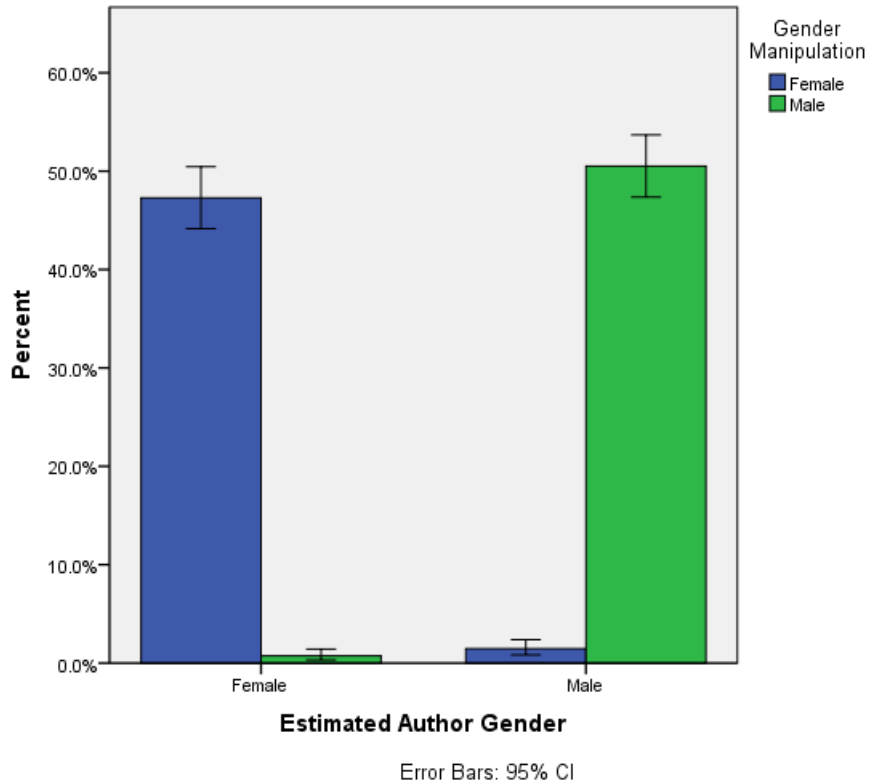
Figure 12: Bar graph illustrating gender manipulation on gender estimates for

dating profiles.

Furthermore, participant confidence in their answers was only slightly affected by the gender manipulation – participants were more confident if they were rating a male author's profile, rather than a female author's. This effect was significant for Case 11 ($F(1, 233)=15.2$, $p<0.01$, $\eta^2=0.08$) and 12 ($F(1, 233)=10.31$, $p<0.01$, $\eta^2=0.06$), the originally dishonest profiles. However, confidence was still very high for all groups (m=4.22 for female authors of Case 11 versus m=4.51 for the male author; m=4.27 for female authors of Case 12 versus m=4.44 for male authors).

Online dating profiles: veracity manipulations. The most frequently used cues for dating profile honesty identified in Study 1 were the writing style, topic, and accuracy. The experimental manipulations for participant ratings of the author's honesty are summarized in Table 24.

Manipulation Tested (Effect Size)	Age	Gender	Veracity	Age * Gender	Age * Veracity	Gender * Veracity	Three-way Interaction
Dating Profile 1: Sincere Male Profile	$F(1, 233)<0.1$, $\eta^2<0.01$	$F(1, 233)=2.0$, $\eta^2<0.01$	$F(1, 233)=1.6$, $\eta^2<0.01$	$F(1, 233)<0.01$, $\eta^2<0.01$	$F(1, 233)=1.7$, $\eta^2<0.01$	$F(1, 233)<0.1$, $\eta^2<0.01$	$F(1, 233)=1.2$, $\eta^2<0.01$
Dating Profile 2: Sincere Female Profile	$F(1, 233)<0.1$, $\eta^2<0.01$	$F(1, 233)=2.3$, $\eta^2=0.01$	$F(1, 233)=1.7$, $\eta^2<0.01$	$F(1, 233)=0.3$, $\eta^2<0.01$	$F(1, 233)=0.4$, $\eta^2<0.01$	$F(1, 233)<0.01$, $\eta^2<0.01$	$F(1, 233)<0.1$, $\eta^2<0.01$
Dating Profile 3: Deceptive Female Profile	$F(1, 232)=1.2$, $\eta^2<0.01$	$F(1, 232)=1.0$, $\eta^2<0.01$	**$F(1, 232)=9.8$, $\eta^2=0.04$**	$F(1, 232)<0.01$, $\eta^2<0.01$	$F(1, 232)=0.5$, $\eta^2<0.01$	$F(1, 232)=0.3$, $\eta^2<0.01$	$F(1, 232)=0.2$, $\eta^2<0.01$
Dating Profile 4: Deceptive Male Profile	$F(1, 233)<0.1$, $\eta^2<0.01$	**$F(1, 233)=10.8$, $\eta^2=0.04$**	**$F(1, 233)=5.5$, $\eta^2=0.03$**	$F(1, 233)=2.3$, $\eta^2=0.02$	$F(1, 233)<0.1$, $\eta^2<0.01$	$F(1, 233)=2.5$, $\eta^2=0.01$	$F(1, 233)=1.5$, $\eta^2<0.01$

Table 24: Summary of general linear modeling for manipulation effects on participant estimates of an online dating profile author's honesty. Bolded tests are significant below p=0.01.

The honesty manipulation for the dating profiles was only successful in one direction – making dishonest profiles seem more honest. That said, participants still considered profiles to be generally honest overall (Figure 13). This is consistent with previous research that suggests that online dating profiles are usually rated as at least somewhat trustworthy (Toma & Hancock, 2012). There was a second effect in Case #12 – the originally male profile was estimated as more honest when the author was changed to a female.
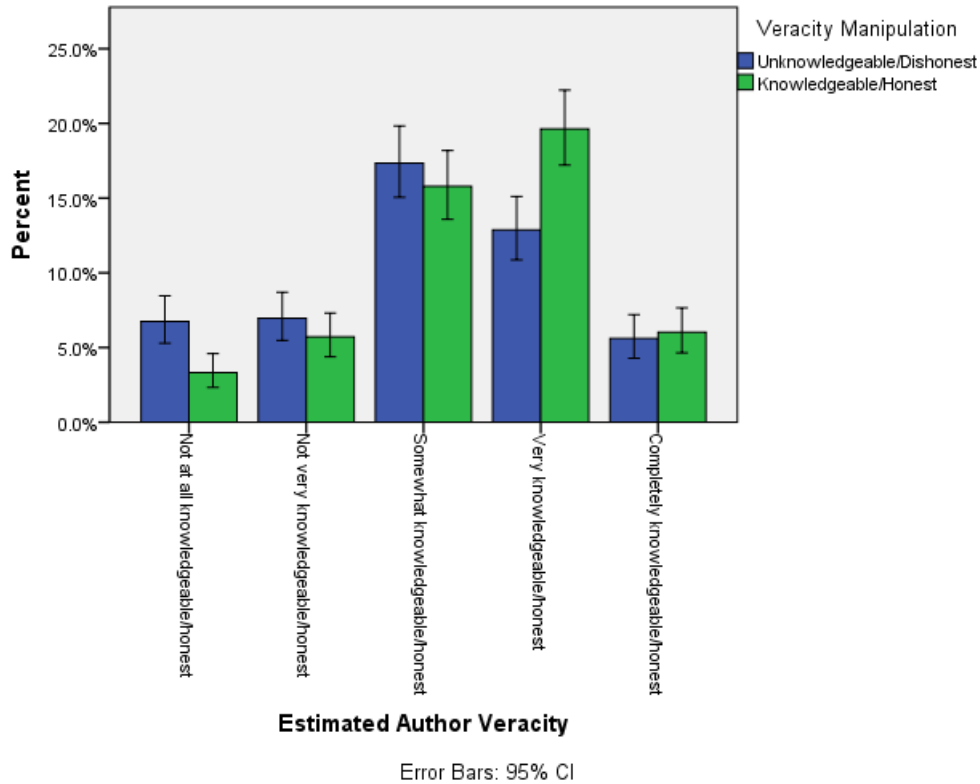
Figure 13: Effect of honesty manipulation on participant estimates of author

honesty for dating profiles.

However, no manipulations had any effect on participants' confidence in

their honesty estimates. Participants were generally confident in their estimates of

the author's honesty (m=3.75). Participants were more confident in their veracity

ratings for profiles they found to be honest, (r(232)=0.146, p<0.01), suggesting

that participants were reluctant to rate profiles as untrustworthy, rather than

trustworthy.

Overall discussion of Study 2 findings. Throughout our experimental

manipulations, the gender and age manipulations were successful in most cases,

both using explicit and implicit cues. In other words, Web users do accurately

describe the aspects of Web content that makes authors look male, female, younger or older.

However, veracity manipulation was much less effective, particularly on the content-based online reviews and online how-to articles. Methods such as changing the content, changing the author's credentials, and changing contextual cues such as ads were not particularly effective at changing participants' perceptions of the author's knowledge in online reviews or online how-to articles, though changing content and writing style in online dating profiles was somewhat effective.

Furthermore, using implicit manipulations for age and was less powerful than an explicit declaration of the author's age or gender. Cues such as the author's face, the start of an author's career, or simply stating the author's age were overwhelmingly used over other indicators. This wasn't totally true in all cases – for example, in dating profiles, a dishonest stated age was effective at changing participants' estimates of the author's age, but participants still used other cues (user photo, description, etc.) to pull their estimates towards a more accurate age.

However, none of the manipulations had serious effects on participant confidence, which remained comparable to the confidence levels of Study 1. Participants were generally confident in all responses.

Table 25 summarizes the most commonly used cues in Study 2 by participants, alongside the cues that were manipulated based on findings from Study 1.

	Most Common Cues in Study 1	Most Common Cues in Study 2
Online Reviews: Age	writing style (64%), user avatar (44%), vocabulary (40%)	writing style (61%), user avatar (58%), vocabulary (56%)
Online Reviews: Gender	username (54%), writing style (50%), user avatar (44%)	user avatar (67%), writing style (67%), user name (50%)
Online Reviews: Veracity	writing style (59%), accuracy (46%), topic (37%)	writing style (51%), accuracy (43%), vocabulary (43%)
Online How-tos: Age	topic (69%), writing style (39%), user avatar (32%)	topic (56%), writing style (38%), user avatar (36%)
Online How-tos: Gender	writing style (67%), accuracy of the post (39%), topic (31%)	topic (43%), **user avatar (41%), user name (29%)**
Online How-tos: Veracity	accuracy (69%) , topic (60%), writing style (52%)	accuracy (66%), topic (55%), writing style (50%)
Online Dating Profile: Age	user avatar (63%), writing style (36%), username (29%) (in addition to stated age)	user avatar (68%), user name (38%), writing style (31%)
Online Dating Profile: Gender	user avatar (76%), user name (52%), writing style (25%) (in addition to stated gender)	user avatar (77%), user name (47%), writing style (32%)
Online Dating Profile: Veracity	accuracy (69%), topic (60%), writing style (52%)	writing style (62%), topic (47%), accuracy (41%)

Table 25: Summary of manipulations of Web artefacts in Study 2 alongside the

cues participants used while reading those artefacts. Bolded cues in Study 2 do

not correspond to similar frequency of use in Study 1.

As the table suggests, participants were very consistent between Study 1

(which determined the manipulations we used) and Study 2 in the cues they listed

as the source of their age, gender, and veracity estimates, suggesting that the

participants in both groups believe that they were using the same cues for their

estimates, even though the effects of the manipulations suggest otherwise.

Discussion of Overall Findings

The two studies described above present a comprehensive picture of

online appraisal – first by identifying what users *think* they are using to determine

someone's age, gender, or veracity in casual online formats such as online

reviews or dating profiles, then by experimentally testing to see if users actually

are using these cues. Though users show great depth and complexity in their

online analyses, several interesting patterns emerged, helping answer the research

questions the study addresses.

Web users know themselves in some ways, but not others. The gender and age

cues participants mentioned in Study 1, generally to explicit gender or age traits

(such as an author bio or user avatar) or changes in tone and language (such as

usage of slang, emoticons, or grammar) were generally effective manipulations in

Study 2. However, implicit indicators of age or gender (such as changing

gendered pronouns, references to spouses or partners, changes in user avatar that

were not of the user's face, etc.) were demonstrably weaker at changing a

participant's estimates, if they were effective at all. Additionally, cues which

required critical analysis, such as changing the content or topic of an artefact,

were likewise not effective or only weakly effective. In fact, surface changes

such as emoticons and grammar, which were identified in Study 1 as part of the

author age manipulations, were also effective in changing veracity ratings for

online reviews, while the cues participants actually identified for veracity in Study

1 often were not. Participants appear to prefer to base their judgments off of facile cues that provide rapid and simple classification of the author. These cues are often correct, but are easy to exploit, particularly in Web content where much of the presentation is either templated by the Web site or exceptionally easy to doctor (as demonstrated by our own manipulations). However, cues that could not be analyzed by a surface analysis of an artefact were often ignored, or at least were much less effective. Apparently, participants are using heuristic rules of thumb to classify authors and the information they present, even as they put that information into action (Tversky and Kahneman, 1974; Daniels, 2007).

Different cues have different strength. Contradictory cues can override each other – Case #5, for example, had a strongly gendered component to the content (instructions on diaper-changing, motherhood-related ads) and so was overwhelmingly assigned to a female author in Study 1. In Study 2, adding a short gendered comment into the bio completely or nearly completely overrode the implicit cue of the topic. However, the interaction effect between the age manipulation and the gender manipulation (the younger author did not mention a husband or wife, instead referring to their own childhood) led to higher levels of contradictory gender responses for the male author writing about diaper-changing than the female author writing about diaper-changing. This did not, however have a significant impact on participants' confidence in their responses; participants were generally confident regardless of the strength of the cues they used (implicit versus explicit, vague versus strictly defined, contradictory cues between different parts of the artefact).

Overconfidence. Users were very confident in their responses, even with very little actual evidence to support their conclusions. Though there was considerable spread in terms of who was confident for each question, participant confidence did not particularly vary with any of the manipulations in Study 2 and showed only some correlation with self-rated participant expertise with computing and the Web. The high confidence of participants is most questionable due to the veracity manipulations, for two major reasons. Firstly, participant estimations for determining honesty or knowledge require analyzing implicit cues, (that is, the user has to critically consider the content the author provided) a more difficult task than, for example, reading an author bio or looking at someone's face. Secondly, some of the low-veracity manipulations have objectively false or poor information. Even then, however, participants showed no difference in neither their appraisal of lower-veracity material nor in their confidence in their wrong appraisals. In other words, there is very little demonstrated doubt on the part of participants for any part of this study, even when some doubt would be appropriate. This lack of doubt is consistent with other heuristic judgment studies – participants who base their judgments off of woefully incomplete information are often still highly confident in their responses and estimates, even when those judgments are the wrong choice given the information they are provided (Kahneman & Tversky, 1973).

Heavy use of stereotypes. Participants frequently used stereotypes about gender and knowledge to base their decisions – for example, Case #1's commentary about noise levels on the lower floors of a hotel was noted by participants as

something an older reviewer might mention, while Case #5, about changing

diapers, was overwhelmingly rated as having been written by a female author,

despite having no author bio available. Considering that many of these artefacts

may very well be written by freelancing journalists, guerrilla marketers, or hotel

owners, stereotypes are not sufficient for participants to draw conclusions from.

Stereotypes are, themselves, a form of heuristic that allows participants to rapidly

sort complex situations and environments based on incomplete information,

filling in the blanks with information drawn from the stereotype (Allport, 1954).

Furthermore, these stereotypes can also inform a participant about how to respond

to those situations, allowing for quick response with lower cognitive demand – a

general benefit for someone operating in a world filled with complex problems

requiring immediate action, but insufficient for grading a particular issue

singlehandedly (Hamilton, 1981).

 "Good enough" veracity. It was very difficult to get participants to rate any

Web artefact as being dishonest or unknowledgeable. Only extremely

abbreviated content (such as Case #4 for the online reviews) was rated as

unknowledgeable. Manipulations to the cues participants listed as important for

veracity in the initial study did work for some of the artefacts in the follow-up

study, but not as powerfully as the age or gender manipulations. In other words,

once an artefact reached a certain threshold of content, participants generally

assigned it an average to above-average rating – even when the online how-to

would not actually complete the task (Case #5, about changing a diaper, only had

half of the instructions in the low-knowledge manipulation), or a dating profile

was deliberately written to be internally inconsistent (Case #11, the dishonest

female profile, was full of contradictions). Participants did rate these as lower in

comparison to the high-veracity versions, but not actually very low overall. Web

users valuing convenience over accuracy is a common finding in the online

information-seeking literature, with users often taking the path of least resistance

to reach "satisfactory" (Van de Vord, 2010).

Chapter 3: Discussion & Future Possibilities for Research

Final Conclusions

The two studies described in this paper attempted to understand the nature

of online social interaction and online critical thinking as it applies to casual

online environments: online reviews, online how-to articles, and online dating

profiles. This analysis was organized into three major research questions: how

and how accurately Web users identify each other online; what factors or cues

lead Web user to these identifications, correct or incorrect; and whether or not

these cues could be manipulated to artificially change a Web user's perception of

the author of Web content.

Research Question 1: nature and accuracy of online identity estimates.

Participants showed both considerable depth and disconcerting flaws in their

identification of online authors. In many cases, participants provided very

reasoned and specific aspects of Web artefacts that led them to conclude the

author's age, gender, and knowledge level. However, participants also often

leaned on stereotypes and readily accepted statements by the author at face value,

if they were read at all (consider, for example, the how-to article about frying an

egg, where many participants were confused by an indirect statement of the author's age).

Furthermore, in terms of accuracy, their online appraisals participants fared poorly in many cases. In Study 1, for example, only a few participants detected the false dating profiles in Cases #11 and #12. The lack of critical analysis of Web content was made more obvious in Study 2 – even Web artefacts that were doctored to be highly uninformative or to be highly dishonest only showed minor reductions in participant estimates of their veracity. This stable trust is consistent with previous research discussing the truth bias and general lack of critical thinking during Web browsing and online information seeking (e.g., Toma & Hancock, 2012; Guha, Kumar, Raghavan, & Tomkins, 2004). Web users, including the participants in this study, rarely find each other untrustworthy, even if the author actually *is* untrustworthy, and even in the face of a popular culture that suggests they should beware other Web users (e.g., Christopherson, 2007).

Research Question 2: cues to online identities. The cues participants identified in Study 1 as the reasoning behind their estimations were, like the estimations themselves, both complex and troubling. In many cases, participants provided complex multidimensional explanations of what parts of a given Web artefact led them to different conclusions, which provided considerable insight into how these cues would later be manipulated in Study 2. However, in other cases, the cues participants identified as using were also often very one-dimensional, focusing only on single cues such as user avatar or username – in fact, participant

confidence in these one-cue appraisals was just as high or higher than their

confidence in more reasoned explanations. This led participants to often believe

false or misleading statements, such as in the false dating profiles in Cases #11

and #12. This problem was further compounded by the general lack of

information literacy skills on display – many participants in Study 1 displayed

questionable logic, such as citing inappropriate authorial experience (for example,

stating that a degree in acting was an appropriate credential for repairing iPods in

Case #7), not noticing or mentioning contradictory information or missing

information, or basing appraisals on surface factors such as using emoticons.

There was also considerable crossover in the cues used by participants – cues

such as emoticons, linguistic errors, and writing style were often used to indicate

the author's age, gender, and veracity simultaneously, with varying levels of

success. The credulousness and general simplicity of the approach Web users

take to appraising online content is well-represented in the research – from how

Web users find their content via search engines (Bar-Ilan, Keenoy, Leven, &

Yaari, 2009), to how they decide a particular Web resource to be informative

(Westerwick, 2013), to the follow-up – or lack thereof – that Web users conduct

to ensure the information they have found is sound (Gibbs, Ellison, & Lai, 2010).

Research Question 3: manipulation of cues to change user estimates. The

cues participants identified as the basis for their appraisals of Web authors

showed remarkable consistency between Study 1 and Study 2, even though those

cues were considerably manipulated between the different forms of Study 2.

These cues were effective at changing participant beliefs in the age and gender of

the author – in other words, participants in Study 1 accurately identified what

aspects of a Web artefact influenced their judgment of the author's age and

gender, even in cases of implicit or contradictory cues. However, in the case of

veracity, this relationship fell apart – changing the cues participants said they used

for veracity did not cause participants to rate Web content as untrustworthy. The

attitudes Web users, particularly younger users, have towards Web content has

been the topic of research for some time (e.g., Dutton & Shepherd, 2003). Some

evidence suggests that younger Web users are more sensitive to contextual cues

about Web artefact credibility (e.g., Liao & Fu, 2012), but other research suggests

that trust in the Internet leads experienced Web users to more readily accept Web

content (e.g., Flanagin & Metzger, 2007). In the case of this study, though Web

users with experience in particular Web media did show slightly higher

confidence in their responses than those without, those experienced participants

did not show any noticeable difference in their actual appraisals, lending more

support towards the latter hypothesis.

Experimental Appraisal: Successes and Challenges

        The goals of the study were to identify, manipulate, and quantify the

various cues and heuristics that Web users apply to their readings of everyday

Web content, such as online reviews, how-to articles, and dating profiles. The

findings, though mostly confined to identification and manipulation, display a

remarkable pattern of results. Manipulations to surface and visual cues such as

user avatar, grammar, or even simple stated age were often overwhelmingly

effective, overriding contradictory but more subtle cues such as inconsistencies

between stated age and user picture or stated gender and Web site context.

However, implicit manipulations on their own, especially pertaining to the

knowledge and honesty of the author, were simply ineffective. Even 'sanity

check' manipulations to the information contained in some artefacts, such as

simply deleting half the steps of a how-to, had no measurable impact. This is

consistent with previous research – participants in judgment tasks often abandon

complex information and prior knowledge when they make heuristic judgments

with incomplete information (Tversky & Kahneman, 1974). This is further

supported by the very high confidence participants had in their estimates, a

common thread in many heuristic judgment tasks (Chapman & Chapman, 1967).

The findings both illustrates the problems with how Web users judge Web content

and how researchers can further quantify the different heuristics Web users apply.

However, this does illustrate a major challenge in analysis. Because of the

questionnaire's setup, it remains very difficult to synthesize the different artefacts

into a statistically analyzable whole to determine the overall strength of any

particular manipulation (e.g., an age manipulation to the user avatar versus an age

manipulation to the author's grammar). Because each participant received several

artefacts by different authors with different manipulations, their estimates for the

author could not be averaged effectively – a manipulation that was not effective

would be concealed by a manipulation that was not effective, two different

participants might have received different manipulations but still have seen the

same amount of young and old authors, and so on. Now that this study has

identified several manipulations that are apparently effective and those that are

not, subsequent studies should not organize themselves around the manipulated author characteristic (age/gender/veracity), but rather the manipulations themselves (grammar/user avatar/etc.). This will allow participant estimates over different artefacts to be combined and analyzed statistically – the final step in quantifying the existence and strength of different heuristic cues for judgments about Web content.

Looking Forward

The furious pace of Web development ensures that any findings about computing, including these findings, will not be current for long. For example, the current focus of the market on mobile computing and tablet technology, such as the ubiquitous iPad or the controversial Windows 8, has many implications for how users interact with Web content, how Web content is produced, and where Web users can actually access online information. Researchers have gone from studying how educators could use a single laptop for their own lectures (Wilmoth & Wybraniec, 1998), to 'ubiqutious computing' environments where teachers and learners all have ready access to computers (Windschitl & Sahl, 2002), to the usage of PDAs and other mobile computing devices (Mifsud & Morcht, 2010). Modern day students carry powerful computing devices of their own in the form of smartphones linked to Twitter accounts, Facebook pages, and Google Talk accounts (to the chagrin of the occasional teaching assistant acquiring mysterious new friends).

The enthusiastic adoption of new Web content by users, mass media, and the marketplace ensures that researchers will not have to look very far to find

extensions for this research. Consider the recent announcement of Google Reader

shutting down – Google Reader served as a newsfeed for many users, which

means its shutdown on July 1 could serve as a platform for research on real-time

Web content delivery – what users are looking for in a news reader, how they

selected the tool that suits their needs, and how long and how often they use their

new reader. Such closures and migrations are common to the Internet and provide

an interesting case of how users gather information online to make decisions –

even decisions as minor as where to get their syndicated newsfeeds.

The research done in this study does not even cover all the potential of

online how-tos, reviews, and dating sites. As noted previously, it was surprisingly

difficult to get participants to rate Web content as poor (rather than simply as

poorer) – additional research would aid in figuring out why this bias exists when

users appraise online content and what cues, if any, might cause Web users to

reject online information. Similarly, additional research could look at the nature

of confidence in online appraisals – why users are so generally confident in their

appraisals, and if this confidence has any consequences on their usage of Web

resources in their daily lives.

Additionally, this follow-up method of examining user appraisals of online

content could be extended to other domains of user-generated content, such as

product reviews (the reviews in this study only looked at services or places of

business), online forums and message boards, or social media channels such as

Twitter – and these are only the channels used in the modern day. Given the

constant evolution of Web content, it is only a matter of time before Web users

migrate to a newer, more functional tool with its own social and technical

restrictions and capabilities. As this suggests, the greatest challenge for Web

research is the challenge of currency. Even the most tech-savvy researcher will

find the times changing over the course of proposing, completing, and

documenting a Web-based research project. That said, many of the skills required

to be a skilled Web user – critical thinking, information literacy, and an awareness

of newly-available technology – have been relevant since the Internet began, and

will likely remain relevant for its entire lifespan. Research such as this project,

may not be directly relevant once algorithms root out stealth marking and dating

profiles include biometric data, but new technology has rarely presented itself

without any accompanying vulnerabilities. Simply put, researchers and

consumers alike will always need to consider the source.

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Appendix I: Artefacts used for Phase 1 (Observational Study)

Section 1 (Online Review #1)

"Hidden Gem in Chicago"

○○○○○ Reviewed 15 June 2012 NEW

What a hidden Gem!! Reasonably priced and customer service to the max! Beautiful boutique hotel where everyone strives to make your stay a wonderful experience. And they succeed! Centrally located at Grand and State. What more can you ask of a hotel.

Room Tip: try and go as high up as possible. I am on the 8th floor and can still hear the traffic on State...
See more room tips

Stayed June 2012, travelled on business

○○○○○ Value   ○○○○○ Rooms
○○○○○ Location   ○○○○○ Cleanliness
○○○○○ Sleep Quality   ○○○○○ Service

Was this review helpful?   Yes   Problem with this review?

Ask Toronto_Travelling about Palomar Chicago, a Kimpton Hotel

This review is the subjective opinion of a TripAdvisor member and not of TripAdvisor LLC

Toronto_Travelling
Toronto

Senior Reviewer
⭐ 6 reviews
🌐 Reviews in 5 cities
🎖 4 helpful votes

Section 2 (Online Review #2)

Kent M.'s Review

Elite '12
10
30
Kent M.
Edmonton, AB

★★★★☆ 3/28/2012 📷 1 photo ⭐ ROTD 6/21/2012

I was very excited to see that Crepe Symphony had opened a week ago. There was little fanfare and despite the fact that I live around the corner, I had no idea that it was in operation! It's great to see 100A St. getting more lively and inviting.

I popped in for a take-out lunch today and was pleased! The girl behind the counter was extremely friendly and conversational. The crepes came out of the kitchen in under 5 minutes. The decor of the cafe is clean, warm and friendly. Free samples of their yummy desserts were offered at the till.

As for my lunch: I tried the chicken and mushroom crepes. They were very tasty and I could see myself coming in again for a light meal, especially over hectic lunch hours. The crepes themselves were perfectly made: soft and fluffy. They were filled with chicken breast, mushrooms and topped with swiss cheese. The pickles that were served along side were delicious too. A dill-like creamy sauce accompanied the crepes, and proved to be a nice compliment to the dish.

Having skimped on breakfast, I found that the portion size (2 crepes) left me a wee bit hungry afterward. However, this could easily be mitigated next time by ordering soup, etc. with the crepes, or even having a scoop of gelato for dessert.

The price point was reasonable ($9) and I'll absolutely be coming in again. Crepe Symphony is a great little addition to the neighbourhood.

Was this review ...?   Useful ● (7)   Funny ●   Cool ● (2)

🚩 Bookmark   ✉ Send to a Friend   🔗 Link to This Review   💬 Add owner comment

Section 3 (Online Review #3)

6/19/2012   9 photos

What is there to say after all these glowing reviews? Well I'll tell you: their toilets suck. They do. As a matter of fact you'll first direct yourself to the cellar thinking it to be the bathroom, but no, it is behind the bar! The sink is an over sized basin fit to wash children in, and you don't get liquid soap, but rather a still-foamy bar. I'm baffled by a bad bathroom, let alone one which can afford itself a flat screen tv, but not just ANY flat screen tv, the worst of them all: the one which broadcasts golf. Why would I EVER want to watch golf, in a bathroom of all places?

Everything has been said about the food: it is rich, but let's put things into perspective: I can handle a full Hooters meal, or a full sugar-schack meal with doubles AND extra maple syrup on ice. Au pied de Cochon is... alright. It is heavy, so eat light before going, but you know, I was expecting absolute decadence and didn't find it, but I think it might have more to do with my order. My foie gras poutine was surprisingly small and I ordered an extra cone of fries to finish the sauce (a bit too salty as others have mentioned). My mom was delighted with her foie gras pie as appetizer and the tongue in tarragon is definitely worth trying! The lobster risotto was huge and, for the very first time, my Dad could not finish his meal, a black pudding pie (also excellent, excellent black pudding). My lemon tart was warm and crumbling under gooey meringue and my mom raved about her creme brulée. All in all a lovely meal.

Why only 4 stars then, and tbh I was on the verge of putting 3? I have a couple little hang-ups about the place, the biggest one being the slight...pompousness of it all. oOHH they can afford not to have a sign with their name! Admit it, their customer service is non-existent. Should you try to call, a pre-recorded message will endlessly tell you to leave a message, and then you're left to pray they might bother to call you back. I found our waiter to be, a bit arrogant (although my parents assured me that was the typical friendly European way! Like, whatever). I notice a couple of people have mentioned not getting what they ordered, I'm sure that could be helped if the waiters would write down orders in the first place. I wasn't terribly impressed by seeing a member of the staff dust the air vents above the tables while we were eating. Sitting on top of the A/C van didn't help my mood or digestion. The place is incredibly cramped and ..I don't know, reading the reviews I guess I was expecting to reach Nirvana or something...   and then there was golf in the bathroom.

Was this review ...?   Useful ● (1)   Funny ● (2)   Cool ● (1)

Section 4 (Online Review #4)

"Best food in Penticton!"

⊙⊙⊙⊙⊙ Reviewed 10 October 2011

My husband and I LOVE this Pub....the food is fantastic, the service beyond compare. Everything is fresh and delicious. Breakfast buffet is a good value. We chose to eat most of our meals at this pub. Try their pizza - yum!

Was this review helpful?   Yes

Section 5 (Online How-to #1)

How to Change Cloth Diapers With Pins

Cloth diapers are making a comeback. Many 21st-century parents and caregivers choose cloth diapers due to enhancements in the design and materials. Environmental concerns regarding filling landfills with disposables also plays a role when choosing cloth diapers. Changing a cloth diaper works in the same way as changing a disposable. Just be careful with the pins.

0

Like   Send   Tweet 0   +1 0   pin it

How to Change Cloth Diapers With Pins. Cloth diapers are making a comeback. Many 21st-century parents and caregivers choose cloth diapers due to enhancements in the design and materials. Environmental concerns regarding filling landfills with disposables also plays a role when choosing cloth diapers. Changing a cloth diaper works in the same way as changing a disposable. Just be careful with the pins.

Step 1
Buy the correct size of cloth diaper based on your baby's age and weight. Sizes range from newborn diapers for babies 0 to 3 months weighing 5 to 10 pounds up to toddler's size. Purchase flat cloth diapers, and fold them in the desired shape to fit your baby, or buy prefolds, which include an extra layer in the center and require a wrap or cover.

Step 2
Lay your baby on a stable surface such as a table, floor or dressing table. Place a towel or changing pad beneath the baby, especially in a public place. Unfasten the diaper pins and remove them, carefully placing them away from the baby.

Step 3
Place the new cloth diaper in a diaper wrap.

YOU MIGHT ALSO LIKE

'Now I Get It!'   What Can My Baby
                                   Bump Hear?

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10 moms describe that moment when they realized what their own mothers went through to make them who they are

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listbliss

Section 6 (Online How-to #2)

How to Fry Eggs in a Stainless Steel Pan

By G.K. Bayne, eHow Contributor

G.K. Bayne

G.K. Bayne is a freelance writer for various websites, specializing in back-to-basics instructional articles on computers and electrical equipment. Bayne began her writing career in 1975 and studied history at the University of Tennessee.

F or many cooks, frying an egg in a stainless steel pan or skillet leaves more egg stuck to the pan than is on the serving plate. Stainless steel is infamous for having hot spots and cooking foods unevenly, which is why eggs may be difficult to fry. Even when using a nonstick spray, you may still have problems, but one method will allow you to fry eggs perfectly in a stainless steel pan. Does this Spark an idea?

Other People Are Reading

How to Clean a Non-Stick Roasting Pan

How to Protect Frying Pans in the Cabinets

Things You'll Need

- ☐ Plastic kitchen scrubby
- ☐ Butter

Instructions

1 Wash the skillet with hot, soapy water. Rub your fingers over the inside of the pan, checking for smoothness. If you feel anything other than bare metal, use a plastic kitchen scrubby to remove the particles from the pan. Dry thoroughly before using.

2 Warm the pan over medium-low heat. Melt 1 tsp. butter for each egg you plan to fry, and swirl the butter around in the pan to coat the entire bottom.

3 Crack the egg or eggs over the pan. Fry the eggs until the egg whites begin to set up.

4 Use the handle to tilt the pan and slide the eggs around. Continue to cook until the egg whites are fully set up.

5 Turn the eggs with a thin metal spatula if you want over-easy or over-hard fried eggs.

Tips & Warnings

- You can also season stainless steel skillets to help prevent sticking in the future. Heat the skillet over medium-high heat. Add 2 to 3 tbsp. vegetable oil to the pan, and swirl the oil around to coat the entire surface. Add 2 tbsp. coarse salt. Use several layers of folded paper towels to scrub the skillet with the salt. Wash with hot water only, and allow to dry. Wipe a thin layer of oil on the surface, and store until needed.

- When frying eggs, use the smallest skillet that will do the job. A single egg can be fried in an 8-inch skillet, and two eggs fit in a 10-inch pan. By fitting the skillet to the number of eggs, you will need less grease to properly fry the eggs.

- The more layers of "clad" on the bottom of a stainless steel pan, the fewer hot spots the pan will have during the cooking process.

Suggest item

Related Searches:

References

The Kitchn: How to Fry an Egg

More Like This

Directions on How to Cook Eggs With a Stainless Steel Frying Pan

How to Get Eggs to Not Stick on a Stainless Steel Pan

How to Cook Eggs With a Stainless Steel Pan

Section 7 (Online How-to #3)

Is There Any Way to Fix My iPod if My Dad Accidentally Washed It?

By Marie Cartwright, eHow Contributor , last updated July 24, 2011

Marie Cartwright

Marie Cartwright began writing in 2010. Her work has appeared on various websites. Having worked previously in theater administration and Web design, Cartwright now works from her home in Northern California. She also maintains an events website geared toward the science and technology community. Cartwright studied performing arts at the University of San Francisco.

A splash of water on an iPod is rarely a problem. However, a prolonged soak can wreak havoc on the internal hardware. Your Apple Warranty won't cover water damage; unfortunately, you're on your own when it comes to getting your iPod back in working order. The famed "rice method" has saved many moistened iPods.

Other People Are Reading

Help With my Frozen iPod

My iPod Won't Mount

Things You'll Need

- [ ] Small flathead screwdriver
- [ ] Dry, uncooked rice
- [ ] Large bowl

Instructions

1 Remove the end caps on your iPod's case. Hold the two halves of the case together and unscrew the bracket. Place the screws somewhere safe and easily accessible.

2 Remove the battery. Carefully disconnect the wires attached to the battery. If you are trying to fix a first or second generation iPod, detach the battery from the hard drive. Slide your screwdriver between the battery and the hard drive to gently pry the battery loose from the adhesive.

3 Place both the battery and the open iPod in a large bowl full of dry rice. Make sure that all of the iPod components are completely covered. Wait at least 24 hours for the rice to absorb any moisture within your iPod.

4 Remove the iPod components from the rice. Make sure there are no grains stuck within the internal hardware. Reassemble your iPod and turn it on.

Tips & Warnings

⚠ Whatever you do, do not turn your iPod on before attempting to dry it out. Turning on your iPod while there is water inside will almost certainly fry the circuitry.

Related Searches:

References

Digital Inspiration: Dropped Your Mobile Phone or iPod in Water?

Technipages: How to Fix a Wet iPod

Tech FAQ: How to Repair a Wet iPod

Planet Green: How to Change the Battery in Your iPod

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Help With my Frozen iPod

My iPod Won't Mount

I Accidentally Washed My iPod

Section 8 (Online How-to #4)

How to Clean a Shower System   c

tweet   pin it

Over time, limescale from water and soap scum can dim the luster of shower fixtures. This happens despite weekly cleaning, and even when household water is relatively soft. Many people replace their shower heads every decade or so rather than thoroughly cleaning them. As people become more environmentally conscious, there is an increased desire among many to clean and repair items that were once considered disposable. Cleaning shower heads and fixtures takes less time and effort than it does to replace them.

What other people are reading

How To Get Nail Polish off Anything   Baby-proofing 101

Step 1 Wipe off all of the wet surfaces after you finish your daily shower. This is the simplest method for shower cleaning. If you wipe out the shower stall and wipe off the shower head and fixtures every day, limescale and soap scum will not be able to accumulate. If multiple people use the shower, the last one out can clean it.

Step 2 Clean the shower with a sponge and scouring powder every week when wiping it down daily is not feasible. If your water is hard, you might need to use a commercial rust and limescale remover in addition to scouring powder.

Step 3 Heat up white distilled vinegar (do not boil it) and put it in a spray bottle. Spray it all over the shower head and fixtures, and let them soak for at least 15 minutes. Scrub them with a nylon-covered sponge and borax.

Step 4 Rub the shower head and fixtures with a dry soap-filled steel wool pad. This is a method of last resort because the steel wool pad might scratch your fixtures. Do not use water with steel wool. This method should remove the buildup.

0 comments

So what do you think? Do tell...

Thank you, Mom

Stories from moms
just like you...

Also worth a look

IN CELEBRATION OF THE FAMILY ROAD TRIP
What happens when it's too expensive to fly? It's road trip time

HOW TO DRESS LIKE A STAR
Like the way these moms pull an outfit together? Here's how to get the look

LIGHT UP WITH NEON
How to wear this season's hottest colors without shocking your neighbors

STORAGE SOLUTIONS FOR EVERY ROOM
14 stylish places to tuck toys away when playtime is over

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What fun craft or just plain fun activities are there for kindergartners?

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- Chic Playground Shoes for Moms
- Beauty Essentials for Tired Moms
- Top 10 Low-Carb Snacks
- Everyday Beauty Essentials
- 10 Stylish Kids' Water Bottles

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Section 9 (Dating Profile #1)

Section 10 (Dating Profile #2)

Section 11 (Dating Profile #3)

okcupid

—% Match
—% Friend
—% Enemy

Marlababy
27 / F / Straight / Single
Queens, New York

Message Her

Join OkCupid

Find better matches
with our advanced
matching system

About   Photos   The Two of Us   Personality

My self-summary
hi im marla searching for someone special someone cute age
26-72. i dont smoke cig. Dont drink. Socialy i will. Or in basement.
like to no more lets get 2gether 2 watch a movie n see how it
goes im a nice gurl so if your serious im f'in serious. Plz dont
smoke. I smoke to keep my stress down n I have a big dog
named Booty so if u dont like dogs move on hes the king lol peace
marla

What I'm doing with my life
lotsa stuff goin on right now prolly too much 2 list but lets just say
im doin very well lol

I'm really good at
drinkin, other stuff

The first things people usually notice about me
my sexiness

Favorite books, movies, shows, music, and food
-law n order is my fav show its like how do they always catch the
bad guy lol
-my fav band r the dixie chicks - dont laugh im a country gurl
-i dont read so no fav books lol unless u count Star mag
-my fav food is 4 sure hot pockets

The six things I could never do without
sum good beer, a lawn chair, front porch, cigs, hot pockets n my
dog booty

I spend a lot of time thinking about
dont get me started or ill be here all day lol i think alot mostly
about different stuff

On a typical Friday night I am
drinkin

The most private thing I'm willing to admit
that im on this site lol jk im not ashamed 2 b here i mean ppl need
to find love n its 2011 so lets use the internet

I'm looking for
• Everybody
• Ages 26–72
• Located anywhere
• For new friends, long-term dating, short-term dating, activity
  partners, long-distance penpals, casual sex

You should message me if
u r lookin for the same stuff as me n we have similar interests.
lets get 2 gether 2 see how it goes i like movies

Her Details

Last Online	May 15
Ethnicity	—
Height	5' 5" (1.65m).
Body Type	Used up
Diet	Mostly other
Smokes	Sometimes
Drinks	Very often
Drugs	—
Religion	Other and very serious about it
Sign	Virgo and it matters a lot
Education	Dropped out of high school
Job	Rather Not Say
Income	Rather not say
Offspring	Doesn't want kids
Pets	Has dogs and has cats
Speaks	English (Okay)
Speaks	English (Okay)

Similar Users

emma11111
Brooklyn, New York
more adventurous

phoebe_k_
Brooklyn, New York
more adventurous

BKPStar
Brooklyn, New York
more adventurous

Mertle0
New York, New York
more adventurous

doglover3737
New York, New York
more adventurous

TheWriteSprite
Flushing, New York
more old-fashioned

catsintrees
Brooklyn, New York
more old-fashioned

JemNoel
Brooklyn, New York
more old-fashioned

Section 12 (Dating Profile #4)

My self-summary

I'm a person who tries to find an adventure in any situation. I'm loyal to my friends, loving to my family, and hardworking in my job. People who know me say I'm easy to talk to, fun to be around and great at being spontaneous.

What I'm doing with my life

The 'work hard, play hard' thing is a bit clichéd, but for me it's pretty much the case. I really think that the harder you work (as long as your work is your passion), the more rewarding and invigorating the fun you have will be. So, I split my time between my job in marketing and my goals of seeing the world, learning new skills and meeting new people (like you – maybe).

I'm really good at

I have a minimum of 5 startlingly entertaining party tricks that have served me well over the years. They're really quite the sight to behold.

The first things people usually notice about me

I'm bright (bordering on candescent, in fact), friendly, with a somewhat dry sense of humor. You might not know if I'm being sarcastic until you see me smiling (or perhaps smirking).

Favorite books, movies, shows, music, and food

My tastes in literature and music are so varied I don't dare summarize them. Tell me what you like and we'll see if I like it too.

The six things I could never do without

Apart from the obvious things all humans need to survive, like electronic spaghetti forks, I couldn't do without my friends, family and the internet. Not necessarily in that order.

I spend a lot of time thinking about

What I can do next, where I can travel, books I should read.

On a typical Friday night I am

I'm either with friends or relaxing by myself.

The most private thing I'm willing to admit

When I'm a passenger in a moving vehicle, I look out the window and imagine a cheetah running alongside us, jumping over obstacles, sometimes disappearing from view, only to dramatically appear again. He doesn't have a name, but if he did, it would be Arrow. But he doesn't.

I'm looking for

- Girls who like guys
- Ages 24–31
- Located anywhere
- For new friends, long-term dating, short-term dating

You should message me if

You know what you like and you like what you see.

Appendix II: Phase 2 Manipulations List

	Age Manipulations	Gender Manipulations	Veracity Manipulations
Case #1: Review of a Chicago Hotel	• Changed user avatar from alcoholic drink to non-alcoholic drink • Perfect punctuation vs. non-perfect punctuation • Emoticon • Commentary about noise on the nearby highway • "Traveled for pleasure" instead of "for business"	• Changed user avatar from a male-oriented drink to a female oriented drink (beer vs. cocktail, e.g.) • Vocabulary changes - "friendly" to "efficient", eg. • Username changed - "traveller" to "travellette"	• Shortened review by removing one sentence • Added commentary about having stayed at the hotel multiple times • Added or removed 'free breakfast'.
Case #2: Review of an Edmonton Restaurant	• User avatar • Vocabulary changes • Emoticon	• Changed user avatar • Content changes – described decor • Changed username - "kentm" vs "katem"	• Less/more information about food • Less/more about restaurant environment/decor • (no) pricepoint mentioned
Case #3: Review of a Montreal Restaurant	• User avatar • Punctuation and grammar • References to parents versus reference to sister/brother, etc.	• Changed user avatar • Username • Content change – (removed) complaints about there being golf in the bathroom.	• Less/more information about missed orders • Less/more about reservations • Less/more about environment (mention of temperature/AC)

Case #4: Review of a Penticton Pub	• Changed user avatar – classic Muppet vs. newer Muppet • Changed 'husband' to 'boyfriend'/'wife' to 'girlfriend'	• Changed user avatar (female Muppet vs. male Muppet) • 'husband' to 'wife'/'boyfriend' to 'girlfriend	• Contracted review significantly - "it's really great" • Changed 'during our trip' to 'we eat a lot here' – tourist vs. local
Case #5: How-to Article for Changing Cloth Diapers	• Changed commentary about diaper changing to mention or not mention the author having children with a wife/husband vs. learning it from parents • Grammar changes	• Gendered statement in preface to article: either references to spouse or references to childhood • Grammatical changes • Changed advertisements	• Cropped out the last half of the instructions (i.e., unknowledgeable article will not actually change a diaper.)
Case #6: How-to Article for Frying an Egg	• Changed when the author started her career in writing ("1975" to "2005").	• Changed pronouns about the author • Changed user avatar. Both pictures are low-res scans. • Didn't change username – used initials for user's first name.	• Shortened many steps and tips. • Changed the author's credentials from 'electronics' to 'home economics'
Case #7: How-to Article for	• Changed user avatar	• Changed pronouns	• Shortened each step by

Repairing an iPod	• Changed user description about when they started their career	about the author • Changed user avatar • Did *not* change stated name – all profiles had "Mark Cartwright", even the female ones	about half, without removing each individual instruction (that is, you would do the same thing following both steps, but with less explanation) • Changed the author's credentials between 'electronics' to 'acting'.
Case #8: How-to Article for Fixing a Shower	• Changed preface from discussion of home ownership/house value to discussion of moving into a new place	• Changed title from "cleaning" a shower to "repairing" a shower • Changed the advertisements	• Shortened each step by about half, without removing each individual instruction (that is, you would do the same thing following both steps, but with less explanation)
Case #9: Sincere Male Online Dating Profile	• Changed user picture • Changed stated age (but also changed age for honesty) • Changed preferred partner age • Fixed grammar, punctuation, spelling	• Changed user avatar • Changed user's stated gender • Changed user's gender preference	• Changed stated age to not match user picture (reversed age from original age manipulation) • Changed statistics to be overly flattering (e.g., physique, stated

			income)
			• Also changed user age preference to match new age
Case #10: Sincere Female Online Dating Profile	• Changed user picture • Changed stated age (but also changed age for honesty) • Changed preferred partner age • Fixed grammar/punctuation/spelling	• Changed user avatar • Changed user's stated gender • Changed user's gender preference	• Changed stated age to not match user picture (reversed age from original age manipulation) • Changed statistics to be overly flattering (e.g., physique, stated income) • Also changed user age preference to match new age
Case #11: Fake Female Online Profile	• Changed user picture • Changed stated age (but also changed age for honesty) • Did *not* change age of preferred partners to match age.	• Changed user avatar • Changed user's stated gender • Changed user's gender preference • Changed gendered vocabulary (e.g., "sexiness")	• Added to the more ridiculous statements to make them facetious (e.g., Emoticons) • Corrected the language errors • Changed stated age
Case #12: Fake Female Online Profile	• Changed user picture • Changed stated age (but	• Changed user avatar • Changed user's stated	• Changed vocabulary and style of the post

	also changed age for honesty) • Changed age of preferred partners to match age (also changed for honesty).	gender • Changed user's gender preference • Changed gendered vocabulary (e.g., "sexiness")	• Added user statistics (for honest profile) or removed them (for dishonest profile)