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Visualizing teens and technology: A social semiotic analysis of stock photography and news media imagery

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Abstract

Previous research on verbal representations shows how the news media consistently depicts young people's uses of digital media in a narrow, negative light. In this article, we present an innovative methodology for demonstrating how young people and their digital practices are visually depicted. We focus on stock photography produced by the commercial image banks which source the news media with much of its imagery. Following an indicative analysis of news media images, we present a social semiotic analysis (grounded also in a descriptive content analysis) of a dataset of 600 stock photos top-sliced from three major image banks. By pinpointing dominant *representational*, *compositional* and *interpersonal* meanings, we show how image banks and, in turn, the news media produce a rather pessimistic metadiscursive framing of 'teens and technology'. These influential visualizations are often reductionistic – consistently centering technologies over relationships; they are also problematic in, for example, their inexplicably gendered and classist assumptions.

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As a contribution from critical and multimodal discourse studies (see Fairclough, 2010; Machin and Mayr, 2012), this article concerns the way digital media – specifically, the practices of young people – are visually depicted in commercial image banks which source the news media with much of its imagery. To set the scene, we start with two ordinary newspaper stories, one British and one Swiss, which exemplify the kind of data, analytic issues and visual ideologies at the heart of our article. These two stories are typical – and typically pessimistic – of the ways young people and their supposed digital practices are depicted in the news (Thurlow, 2007, 2014; c.f. Hasinoff, 2012). With very few nuanced accounts of the positive and negative, the pros and cons, journalists, as in these two cases, seem preoccupied with the deleterious moral, psychological and cultural ramifications of technology. In the first instance (print only), digital media are predictably (negativity is a core news value) and dramatically linked to a host of social problems and moral anxieties. Under the banner 'Members of the iGeneration sleep less, date less and have fewer friends', this is a story which partly focuses on girls and young women, but not exclusively so. In the second instance (http://m.20min.ch/schweiz/news/story/20256845), a story about the demise of telephone conversations ('Many don't know how to make a phone call'), we learn that young people apparently prefer WhatsApp to 'proper' communication.


Put down your smartphone

Members of the iGeneration sleep less, date less and have fewer friends

There are few more obvious cries for help than self-harm. The idea of slashing your arm with a razor blade or slicing your leg with scissors to release feelings of anger, pain and desolation seems perverse. Yet for more than a century there have been clinical reports of people mutilating themselves when emotions or stress become overwhelming. Now the number of British teenagers engaged in such desperate actions is rocketing.

The latest alarming evidence on this epidemic of youthful despair came last week in *The British Medical Journal*. A study based on 674 GP practices found girls aged between 10 and 19 three times more likely to self-harm than boys – and incidences among girls aged 13 to 16 increasing more than two-thirds over three years. This is shocking and highly significant, especially when such people are far more likely to later commit suicide or die from substance abuse.

Yet this staggering finding caused few ripples. Another recent report in Wales found children as young as six logged as self-harming in schools. One council reported referrals to social services rising six-fold in three years. Psychologists often have horrific cases of self-cutting. Many parents of teenage children have their own tales of troubled kids, even from secure and loving backgrounds.

There are many causes for this mental health crisis. Yet how much damage is caused by that smartphone revolution unleashed by Steve Jobs a decade ago with his prophetic words that sometimes "a revolutionary product comes along that changes everything"? As an optimist I see this device as amazing for humanity, marvelling at its disruptive global impact. Yet we cannot ignore the dark side of the digital world.

Certainly I am enslaved by the mini-computer in my pocket. Intuitively it feels wrong to spend so much time staring at its small screen, to be so distracted by emails and diverted by Twitter. Now there is alarming evidence the machines may be having a malign influence on the iGeneration – those born after the internet, growing up with smartphones in hand and starting on social media well before secondary school.

Psychologists say the prevalence of pornography is having a profound influence on young people, even pre-pubescent primary school pupils. Now comes evidence this generation is seeing friends less, dating less, sleeping less, going out less than previous ones – and that those glued most firmly to their phones are more likely to suffer mental health issues and even, in the worst cases, to kill themselves.

These findings come from American psychologist Jean Twenge in her new book, previewed in a provocative magazine article. She has been studying generational attitudes for 25 years, poring over data going back almost a century. "Around 2012 I noticed abrupt shifts in teen behaviours and emotional states," she writes. "I had never seen anything like it." That date was when the proportion of Americans with a smartphone surpassed half the population. Britain soon followed suit.

Her article is littered with alarming statistics. I found one very stark: the number of teenagers getting together with friends fell more than 40 per cent over the first 15 years of this century. At that age, I tried desperately to escape limits on my liberty. Yet in the United States 15-year-olds now go out less often than 13-year-olds went out as recently as 2009. So teens are less likely to be hanging out, those moments of forging friendships and exploring relationships. Instead, they are online.

Studies indicate teenagers spending the most time on screens and social media are more likely to be unhappy than those playing sport, participating in social activities or even doing homework. And when loafing around or at parties, the iGeneration routinely shirren activities on social media. Yet this fuels judgement and insecurities among those not invited, with feelings of insecurity and loneliness hitting all-time highs.

Girls, traditionally using social media more than boys, are most likely to suffer such fears in a sexist society that places such store on female looks. Is this linked to those latest self-harm figures? Or to a recent government study that found one in three teenage girls suffers anxiety or depression? Or to another finding that one in four girls is clinically depressed by the age of 14? Teenage also points to a sharp rise in sleep-deprived teenagers failing to get seven hours of rest a night – especially heavy users of computers and smartphones – let alone the nine recommended by experts.

It is not all bad news. Since teenagers meet each other less often they take fewer drugs, drink less alcohol and start having sex later, aiding the decline in teenage pregnancy rates. They are also highly tolerant. But suicide rates for young people have risen: to a 14-year high for British children and teenagers, and to the highest level since records began among students.

These findings, although often based on correlation not firm proof, should provoke fierce debate.

The internet age remains in its infancy, yet this is the first generation fully raised in a digital environment. Nor should we ignore the corrosive impact of parents plugging infants into iPads from an early age, then being endlessly distracted themselves from their offspring by Facebook and suchlike.

There is always alarmist fear of new technology. We must embrace the brave new world unfurling before our eyes with amazing rapidity since it brings many benefits. Yet this does not mean we should not question if the iGeneration is alerting us to the consequences of mass flight into a virtual world, symbolized by those bloodied arms and scarred legs of teenage girls.

"People glued most firmly to their phones are more likely to suffer mental health issues

i@inews.co.uk

Figure 1. Extract from iNews, UK (reproduced with permission); insert quote: *People glued most firmly to their phones are more likely to suffer mental health issues.*

In both these fleeting examples, it is the accompanying images (e.g. Figure 1) which interest us most. To start, they are easily identified as stock photography.[1] In both, we see young women glued to their phones; we see no-one else, nor do we see what these young women are looking at on their phones or with whom they are in communication. This is a vision of technology as something decontextualized or disembedded, and de-socialized. It is, we will suggest, a consistent, patterned way young people and their digital media practices are pessimistically and unfairly visualized.

The selection of these types of news images – usually a choice not made by the journalist herself – is sometimes quite pointed, as with the hooded teen depicted in the British story. At other times, the images chosen are quite random and generic, as in the Swiss story. Or at least this is how it seems until one starts to look more carefully, more systematically and on a much bigger, more extensive scale. Indeed, our goal here has been to document and understand the subtle (or not so subtle) role visual communication plays in shaping cultural discourses about digital media practices (c.f. Kelly, 2009) and, specifically, those of young people. Critically speaking, we have set out to evidence and draw attention to the apparently skewed and potentially problematic ways this can happen, not unlike previously documented verbal misrepresentations (Thurlow, 2017; c.f. Thurlow, 2007). Ultimately, we are concerned with the agenda-setting – or, at least agenda-building – role of major, international image banks in the news media's visual regimes. Before we go any further, however, we offer a short theoretical framing followed by methodological grounding for our study.

Digital discourse, multimodality and metadiscourse

Within the broader framework of discourse studies, our study orients specifically to digital discourse studies (see Thurlow, 2018, for an overview; also Georgakopoulou and Spilioti, 2015; Seargeant and Tagg, 2014; c.f. Herring, 2001). This is a field of research focusing on sociolinguistic and discursive phenomena in so-called new media, typically attending to both micro-level linguistic practices and macro-level socio-cultural processes. Digital discourse scholars are increasingly interested in how language intersects with other modes of communication, addressing the inherently *multimodal* nature of discursive practice (see Thurlow et al., 2020; c.f. Machin and Mayr, 2012). There are certainly good reasons for opening up digital discourse studies to this broader semiotic perspective, not least of which is the increasing visuality of digital media. Even supposedly text-based digital discourse is often as much visual as it is linguistic, concerned as much with the look of words as with their semantic or stylistic properties (c.f. Vaisman, 2014). There is certainly more and more work being done in digital discourse studies on the communicative uses of visual resources, from emoji to non-moving images to video (e.g. respectively, Androutsopoulos and Tereick, 2015; Dürscheid and Siever, 2017; Tan et al., 2018).

Beyond the examination of visual communication in digital media, however, there is also value in considering a second, related gap in the literature: the way digitally mediated discourse is itself visually represented in, for example, commercial advertising, print or broadcast news, cinema and television narratives, and/or public policy and educational settings. As we showed above, the news media's depiction of

young people and their supposed digital media practices is clearly a multimodal accomplishment with images encoding a number of media and other socio-cultural ideologies (Thurlow, 2017). To this end, our article addresses a sub-field of digital discourse studies concerned with *metadiscourse*, that is, with discourse about discourse. We are thus less concerned with how people are actually using digital media and more with the ways their real or putative communicative practices are (publicly) represented and talked about.

Metadiscursive commentary is inherently a matter of ideology (Woolard and Schieffelin, 1994). When people talk about other people's ways of speaking or communicating, they are invariably invested in wider acts of social categorization and judgement. It is precisely this which previous studies have shown when it comes to the intense policing of young people through, for example, the news media's reporting of their digital media practices (e.g. Thurlow, 2014). As Irvine and Gal (2000) argue, people's talk about talk is organized according to three specific discursive tactics as follows:

(a) *Iconization*, whereby certain stereotypical linguistic features or practices are singled out for critique or ridicule;
(b) *Erasure*, whereby individual variation, creativity and other benefits are conveniently or selectively overlooked;
(c) *Recursivity*, whereby ostensibly linguistic 'facts' are extrapolated to other aspects of speakers, such as their intellectual capacity, social behaviour or moral rectitude.

In our analysis below, we find the same kinds of ideological processes emerging in the visual representation of digital discourse. Furthermore, as Gershon (2010) observes, metadiscourse about digital media is obviously entangled with various tightly related media ideologies; in other words, the way people recognize or misrecognize the role of material affordances, authorship and newness, for example.

These are the conceptual issues and analytic devices which structure our article. To recap, we are helping to expand the scope of digital discourse studies by looking not at what young people are doing with visual resources per se, but at the way their digital practices are visualized as a form of metadiscursive framing. Our intervention inevitably intersects closely with the wider field of visual culture studies (see Aiello and Parry, 2019). In this regard, we take visual communication to be not only a distinctive mode of communication but also one which, following Kress and van Leeuwen (2001), is nowadays especially powerful and influential. Nowhere is this more apparent than in the world of commercial stock photography.

Stock photography and news media imagery

The images we examine in this article are part of a much broader visual economy (Rose, 2010). Indeed, newspaper portrayals of 'teens and technology' are not simply a genre in their own right or even specific to the news media or to any particular news media outlet; rather, they are part and parcel of the commercial image industry of which stock photography is one of the major players. The cultural-political or ideological implications are

significant; as Machin (2004) observes, a handful of dominant image banks effectively produce a globalizing 'visual language' with a vision of the world that is pre-structured along formulaic, clichéd and consumer-driven lines. To make things concrete, we recommend jumping ahead momentarily to see Figures 5, 6, 8, 9 and 10 reproduced with permission below. These are what we have come to recognize as very typical 'teens and technology' stock photography.

Frosh (2013: 131) characterizes the stock photography business as the 'Leviathan of the image', having previously noted its centrality as 'an industrialized system of image-production' (Frosh, 2003: 3). In 2012, the global market for stock images amounted to US$2.88 billion and was spread across 2500 commercial image suppliers mostly located in Europe, the United States and Asia (Glückler and Panitz, 2013). It is estimated that this market will exceed US$4 billion by 2020 (Technavio, 2016). Through digitalization and the internet, the stock image market has expanded to all areas of contemporary media culture. Commercial images, and stock photographs in particular, have become essential to how people engage with media content both online and offline, across genres, platforms and borders (Stöckl, 2020). In fact, two companies in particular – Getty Images and now also Shutterstock – are heavily involved in the production and distribution of news imagery and editorial photography. In a pilot study conducted as part of the Digital Methods Summer School in Amsterdam (https://wiki.digitalmethods.net/Dmi/TakingStock), Aiello and her colleagues found that it is often difficult to know whether the images we encounter daily in news media come from 'stock', or whether they are properly editorial or, instead, so-called 'creative' images. The boundary between commercial imagery and photojournalism is increasingly blurred; all of which has important ideological implications.

An increasing amount of news media imagery originates in just a handful of corporate content providers distributing stock photography globally (Gürsel, 2016; Machin and Polzer, 2015). Consequently, the news may increasingly rely on generic rather than specific visual claims about 'facts'. Indeed, current perspectives on the veracity and ethics of news content often highlight the ways in which visual imagery may be mobilized, manipulated and indeed fabricated to prove a point (Wardle, 2017). Given recent debates about so-called fake news and 'post-truth' politics (Bounegru et al., 2017), a critical appraisal of generic imagery in newsmaking would seem pressing. And yet, public awareness of stock photography remains very limited and largely dismissive (Aiello, 2016), even though the news media has been in the spotlight for its questionable uses of stock photos for the purposes of in-depth journalism.

Against this theoretical and cultural-economic backdrop, our study was designed with the following research questions in mind:

1. What are the dominant conventions in stock photography for visually representing young people and their digital media practices?
2. How are these metadiscursive visualizations structured along ideological lines by, for example, processes of iconization, erasure and recursivity?
3. What evidence do we find for the reliance of the news media on image banks; and, on this basis, to what extent does stock photography shape the news media's visualization of 'teens and technology'?

Our study: visualizing (and mediatizing) teens and technology

The empirical bedrock of our article (Part 2) is a social semiotic analysis of 600 stock photographs drawn in equal measure from three of the major international image banks: Alamy, Shutterstock and Getty Images. Our goal is to reveal how the 'Leviathan of the image' (see above) visualizes young people and their digital media practices – what, in simple terms, we are glossing as 'teens and technology'. Before turning to this core analysis, however, we begin in Part 1 by looking first at an indicative news media search and the real-world uptake of stock photography. The news media is one of the major outlets for image banks and, thus, one of the ways many people regularly encounter stock photography and its particular 'visual language' (Machin, 2004).

We used Google News for generating a dataset of 228 distinct news stories, all concerned with young people and technology; our search terms included 'teen*', 'youth', 'young people' and the deliberately broad, catch-all term 'technology'. From a procedural standpoint, we limited our search to include (a) only English-language results and (b) only results between January 2014 and September 2015. Most of our news media data are therefore from the United States (54%) and the United Kingdom (36%), with just a handful of sources from other Anglophone or non-Anglophone countries. Our dataset included many well-circulated British newspapers (e.g. The Guardian, BBC, The Telegraph), several US American state and local newspapers, a small number of nation-wide newspapers from other countries and a handful of 'parent advice' and 'business-and-tech-trends' news portals. Our indicative analysis did not otherwise distinguish specific types of paper or specific sections in newspapers. All other search parameters were left in their default setting: searching 'the web', 'all news' and 'sorted by relevance'. To manage the 'filter bubble' (Pariser, 2011), we used private mode for all of our searches. While this choice mitigates some biases (e.g. cookies are not stored), there are still other factors that will have structured our search such as IP-linked location. Given our focus on visual representations, we excluded news stories which had either no images or only thumbnail images. All of the news stories were among the top 100 search results which Google News returned, although we excluded those only tangentially related to our topic.

From this indicative convenience sample, we extracted the headlines together with all accompanying images and any image captions. Wherever possible, we also pulled information about the image sources. In a last step, we used Google Images to conduct reverse searches using a subset of images (September 2015, $n = 82$) to reconstruct how stock photos circulate online. Again, this part of our sampling and analysis does not claim to be representative of all news media and/or of all newspapers; the main intention is to demonstrate the general nature of 'teens and technology' imagery in the news media and, especially, to signal its dependence on stock photography. As we mean to show, however, we nonetheless believe the indicative findings from our news media analysis to be telling in and of themselves.

For the second and main stage of our study reported in Part 2, we used the data from this initial media search to identify the three dominant image banks being used (Getty Images, Shutterstock and Alamy). On this basis, we conducted a search on each of the

three image banks using the deliberately broad 'teens and technology' terminology mirroring the news media search. In using this loose, vernacular framing, we were interested to see how the semantic field of 'technology' was being produced by the image banks. Ultimately, we created a dataset of 600 images comprising the first 200 images returned by each of the three image banks.

For analysing our stock photography dataset, we used the interpretive procedures of social semiotics, although grounded in the descriptive possibilities of content analysis (Bell, 2001; Jewitt and Oyama, 2001; c.f. Thurlow and Aiello, 2007). Content analytic procedures enabled us to highlight recurrent representational tropes and thereby to surface prevailing ideological agendas. Importantly, though, social semiotics takes one beyond the *what* of images to the *how*, which is to say, the meaningful choices made in the way images are designed. We were therefore able to examine not only the representational meanings of images but also their compositional and interpersonal meanings. We return to these conceptual matters later and in more detail. Through this social semiotic approach, we were eventually directed to the visual economies of stock photography but also the visual regimes of truth at work.

In presenting our results, we are restricted by the very same visual economies. In this regard, one of the most frustrating challenges in much visual communication research is the impossibility of reproducing actual data, much of which is subject to stringent copyright regulation – especially the kind of profit-generating imagery of stock photography. So, where we are easily able to reproduce and publish the newspaper headlines and image captions, we are prevented from doing the same with the images – even for the sake of scholarly comment and critique. However, we have done our best to secure and pay for permission to reproduce a reasonably representative selection of stock photos (see endnote 1).

Part 1 – news media imagery

As we explained above, our analysis of news media imagery was organized around headlines, images, images captions and image sources; we also conducted a reverse search on some of the images. This simple framework is offered as one way of doing a properly multimodal analysis of word-image relations in news discourse.

Headlines

Like the images themselves, newspaper headlines are usually not written by the author of an article; we nonetheless take them to be an especially influential genre, setting the tone of the article and certainly anchoring any images in key ways. A brief survey of headlines in our indicative sample confirmed the general framing and tone of the news media's coverage of young people and their digital media practices. At the very least, the headlines give an indication of the range of issues being reported when we collected our news media images. In this regard, the most common topics were addiction, deteriorating communication skills, miscommunication and disconnection between teenagers and their parents, sexting, sleep and mental health issues. Examples (linked to original source) of this metadiscursive terrain include the following:

Study: Tech addiction hinders teens' social skills
(https://web.archive.org/web/20150806073133/http:/www.kctv5.com/story/29431308/study-tech-addiction-hinders-teens-social-skills);

Fifty per cent of teens sext by mobile phone
(https://www.smh.com.au/technology/fifty-per-cent-of-teens-sext-by-mobile-phone-20150731-giot3z.html);

Social media is harming the mental health of teenagers. The state has to act
(https://www.theguardian.com/commentisfree/2015/sep/16/social-media-mental-health-teenagers-government-pshe-lessons);

Teenagers 'more confident talking to each other via smartphones than face-to-face'
(https://www.telegraph.co.uk/women/mother-tongue/10793984/Teenagers-more-confident-talking-to-each-other-via-smartphones-than-face-to-face-study.html);

Teens' night-time use of social media 'risks harming mental health'
(https://www.theguardian.com/society/2015/sep/11/teens-social-media-night-risk-harm-mental-health-research).

Again, we do not claim these headlines are representative of all 'teens and technology' news stories – nor even all the ones in our dataset; however, based on previous research, they certainly appear to be quite typical (again, see Thurlow, 2007). We likewise note that this metadiscursive framing is structured by the three ideological tactics introduced above: iconization, erasure and recursivity. Only certain iconic features or aspects of young people's digitally mediated communication are singled out for comment or criticism as if they are true of all communication, while many other aspects are overlooked or erased. Meanwhile, issues specifically related to communicative practice are recursively extrapolated to other domains of cultural practice or aspects of social life (e.g. mental or sexual health). Importantly, these same biases may also be expressed visually, as Thurlow (2017) has previously shown and as we ourselves show next.

Images

Here, we begin to see some of the most common ways young people and their digital media practices are visually depicted. Our more extensive content analysis of stock photography pursues some of the same issues. For now, we merely mean to draw attention to how the news media's visual communication, like its verbal communication, can flatten cultural discourses about 'teens and technology'. As with the two examples at the start of our paper, and based on our sample of 228 news stories, our strong impression is that the news media produces a similarly one-dimensional vision. To illustrate the ways this happens, we offer four examples which we consider to be typical in terms of their generic representational content, their composition and their interpersonal style (these social semiotic features reappear in Part 2). We also include the image captions for consideration, not least because they surface some curious disconnects in the image-word relations.

In Figure 2 (https://www.theguardian.com/society/2014/nov/05/children-cyberbullying-self-harm-gaming-mps-concern), we start with a quintessentially generic image: a

close-up shot of a keyboard with a silhouetted, partial hand. This is a perfect example of what social semioticians call a *conceptual image*. The caption is needed for anchoring the image's meaning as being related to the 'mental wellbeing of children and young people'; without this caption, the image reveals nothing of the person concerned, the setting, or any communicative actions. This is the kind of genericity favoured by image banks because the same image may be used multiple times for different purposes. In Figure 3 (http://theconversation.com/teens-without-smartphones-encounter-a-new-digital-divide-40947) meanwhile, a little narrative detail (i.e. blurred supermarket background) is offered in an otherwise generic image. Again, technology is centred and made most prominent – more so than the user or their communication (see Thurlow, 2017; also below). It is the caption which tells readers the image is supposedly concerned with low-income teens.

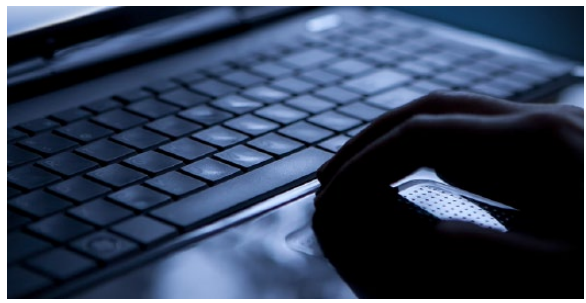


Figure 2. Guardian newspaper, UK. Original caption: *Cyberbullying and websites advocating anorexia and self-harm are posing a danger to the mental wellbeing of children and young people, MPs found.* (Photo: Shutterstock, reproduced with permission).

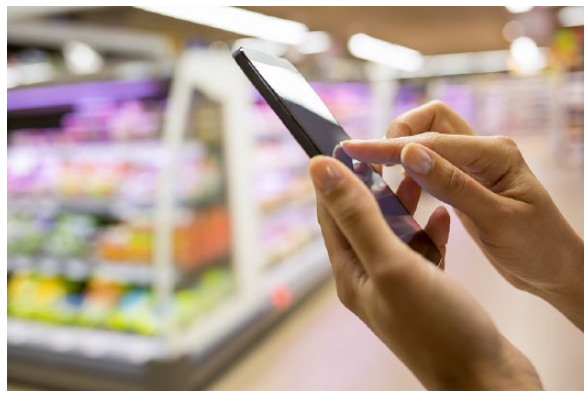


Figure 3. The Conversation (international). Original caption: *Low-income teens are unable to participate in social media conversations of their wealthier peers.* (Photo: Shutterstock, reproduced with permission).

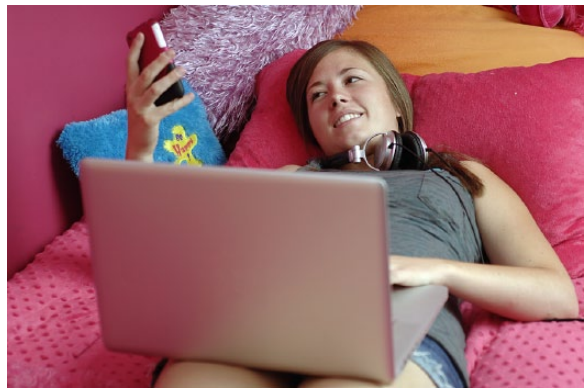


Figure 4. NY Daily News, USA. Original caption: *Study results indicate the need for parental involvement online in order to reduce cyber-bullying.* (Photo: Shutterstock, reproduced with permission).

In many respects, Figure 4 (http://www.nydailynews.com/life-style/parents-protect-kids-cyberbullying-article-1.1816753) is one of the archetypal ways young people and their digital media are visualized. Here, a smiling young woman is shown alone on her bed or a sofa, with a laptop, headphones and cell phone, doing what one cannot tell. Somewhat confusingly, given the smile on her face, the caption invites readers to understand this as a scene of cyberbullying. Finally, we present the equally iconic Figure 5 (https://www.smh.com.au/technology/fifty-per-cent-of-teens-sext-by-mobile-phone-20150731-giot3z.html): two similarly happy, shiny young women staring at their phones, against a blurred, non-descript backdrop (possibly outside?). As always, the image reveals nothing certain about the users or their online actions; however, the caption (as with the story itself) reports that half of teenagers (male and female) sext explicit images of themselves.

Figure 5. Sydney Morning Herald, Australia. Original caption: *A survey found half of teenagers have sexted sexually explicit images of themselves.* (Photo: Adobe Stock, reproduced with permission).

At this stage, our snapshot of news media imagery surfaces the familiar ideological tactics; specifically, there is the 'iconizing' of phones and fingers on keyboards, the erasure of any detail about communicative functions or specific social relations, and then recursive leaps made from vague, non-specific imagery to otherwise complex issues of mental illness, poverty, cyberbullying, and sexuality.

Image captions

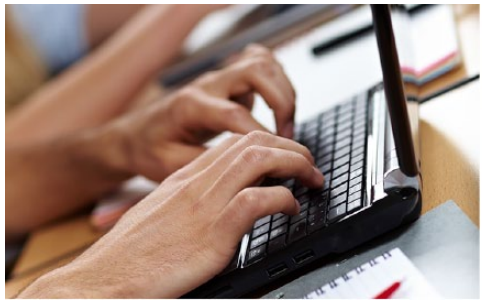
Even by looking only briefly at the captioning of images, we get an insight into (a) the way newsmakers often point explicitly to preferred readings in otherwise vague or generic images and (b) the occasionally oxymoronic relation between the visual and verbal content of news stories. The consistently gendered disconnect between caption and image is something we return to presently, but it strikes us as odd how so many images show only young women when articles are only tangentially related to them, if at all. We likewise found instances in our dataset where the same caption was used for two different images; note, for example, two stories appearing in the UK's Guardian newspaper, first in its 'Mental Health' section (https://www.theguardian.com/society/2014/nov/05/children-cyberbullying-self-harm-gaming-mps-concern) and then in its 'Society' section (https://www.theguardian.com/society/2014/nov/05/society-briefing-mental-health-children-young-people). This all points nicely to the often quite ambiguous, loose or even random connection between visual and verbal content in news stories, especially when it comes to the use of creative stock photography.

Image sources

As one important aim of our news media analysis, we were also able to confirm the influential role played by commercial image banks in shaping or at least feeding the news media's visualization of young people and digital media.[2] For 92% ($n=210$) of the images in our dataset, we could identify an image source; of these, 73% were indeed from image banks, and seven image banks in particular. The most frequently used bank was Getty Images (44%) including its subsidiaries iStock (8%) and Thinkstock (9%). The other major commercial sources represented were Shutterstock (14%), Alamy (13%), Reuters (5%), EPA/APA/PA (4%), Corbis (1%) and 123RF (1%). Otherwise, images were sourced by the newspaper itself (7%), from Flickr (individual artists) (5%), by individual photographers (3%) or from other sources (3%). On the basis of these findings, we selected the three image banks (Getty, Shutterstock and Alamy) used in our stock photography analysis reported in Part 2. For now, though, the key point is that two-thirds of the images in our indicative news media sample were sourced by only a few major image banks.

Reverse searches

By conducting reverse searches, we are able to demonstrate how single stock photos are indeed circulated and used repeatedly; this is central to their profit-generating success. We offer two cases in point.




Figures 6 and 7. Reverse-search images from Shutterstock and Getty. (Photos: Adobe Stock and Getty Images, respectively, reproduced with permission).

In the first case (Figure 6), we have another very generic 'hands-on-keyboard' image; this was initially found in an article published in the Irish Times under the heading *Irish teens among best at using the internet* (https://www.irishtimes.com/news/education/irish-teens-among-best-at-using-internet-1.2351639). This same image was, however, used several times by the same newspaper for different stories – such as another, somewhat contradictory story titled *Teenagers are not that internet savvy* (https://www.irishtimes.com/opinion/breda-o-brien-teenagers-are-not-that-internet-savvy-1.2934897). The image was also used elsewhere by, for example, an Algerian news website for a story about digital crime; for illustrating the development services of a Swiss IT company; on the cover of a book called *Success with Online Education*; as well as on the website of a nursing college in the USA. As we say, this is precisely why generic images are so valuable for image banks. With equally striking and somewhat comical results, our second reverse-search case (initially located in a Time Magazine article in our dataset) showed a row of four young people (we surmise two males and two females) leaning against a wall and working busily on their phones – see Figure 7. A snippet of the two young women's faces is given; they appear to be looking at one phone together. Again, this image was used twice for completely contradictory purposes by the UK's Telegraph newspaper for stories only a month apart: the first was headed *Mobile phones* '*pose no health risk*' *according to report* (https://www.telegraph.co.uk/technology/news/10636197/Mobile-phones-pose-no-health-risk-according-to-report.html), and the second was headed *Texting for long periods* '*could lower life expectancy*' (https://www.telegraph.co.uk/technology/mobile-phones/10721014/Texting-for-long-periods-could-lower-life-expectancy.html).

In summary, these indicative reverse searches, together with the news media's quite apparent reliance on image banks, establish both the ubiquity and apparent influence of stock photography. Also confirmed is the preference of the news media, under the sway of image banks, for largely generic visual representations of technology and/or teens. This brings us nicely to Part 2 where we look more closely at the agenda-setting or agenda-building done through stock photography.

Part 2 – stock photography

To recap, we used our news media dataset partly for identifying the three dominant image banks whose stock images circulate in online news media stories about young

people and their digital practices. Using the same broad 'teens and technology' search parameters, we started by scraping 600 'creative' images from each image bank to compile an initial dataset of 1800 stock photos. We chose the filtering option 'most popular'. These photos were downloaded between 2 October 2015 and 3 October 2015.[3] For each search result, the following was recorded: the image itself, its unique ID (or the code identifying the image) and the keywords used by the image bank to define the image.

For the foundational visual content analysis, we created a sub-sample dataset of 600 images, comprising the first 200 search results from each image bank, which is to say, the most popular images and the ones most closely related to our search terms. Our coding sheet was developed by a research cluster including five student research collaborators (including author Portmann), who met weekly over a period of two months to test and iterate the coding sheet five times. Before proceeding with our final coding, a Krippendorf alpha test was run on a sub-sample of just the Getty images; a score of 0.787 prompted us to calibrate intercoder agreement further, especially vis-à-vis compositional variables. We did not run a second test but final coding of our 600-image dataset was conducted by the same five researchers. To enhance the overall reliability of our coding, each 200-image subset from Alamy, Getty and Shutterstock was coded independently by two, two and three people, respectively.

A copy of the final coding sheet is available online (https://crispinthurlow.net/nms-coding-sheet.pdf) for making transparent our variables and related values. In short, it comprised 20 variables developed according to three communicative metafunctions identified by social semiotics: *representational meaning, compositional meaning* and *interpersonal meaning* (see Van Leeuwen, 2005). We explain these notions when we get to them, but essentially our analysis addressed image content, image layout and the affective connections established between represented participants in the images, as well as with viewing participants. This was a largely qualitative content analysis in the service of the main social semiotic analysis; with the exception of percentage indicators and a one-off correlation test, we therefore eschewed descriptive statistics, orienting rather to the ambiguity and communicative openness of images, to follow Aiello and Parry (2019).

Representational meanings

Not surprisingly, given the core commercial imperative of image banks, the vast majority of the photos in our dataset were more conceptual or abstract, rather than narrative and editorial-factual. As such, they appeared much like the four we shared above in the news media analysis. Most of the photos (82%) were rated as having either low or medium contextualization (i.e. little or no background detail or explicit setting). Visually speaking, viewers are not told what's going on; they are instead presented with a vision of young people doing nothing in particular and doing it nowhere in particular (see Figures 7, 8 and 9 for example). In this way, young people's digital media practices appear both non-specific and non-purposeful. Any sense of the actual content and communicative-cum-social function of their mediated exchanges is left to the imagination – or, in the case of the news media, is anchored (i.e. given clear meaning) by accompanying verbal content.

Stock photographs mostly showed people on their own with 44% of the images showing only one person who may or may not be interacting with someone at the other end of a device. A further 48% of the images showed pairs and/or small groups (21% pairs, 27% groups of 3–5 people); this does open up the possibility of narrative detail, although, as we discuss in more detail below (see 'double-disconnect'), multiple represented participants are seldom shown actually engaging with one another. In fact, only 2% of all photos in our dataset showed people really looking at each other. In Turkle's (2011) pessimistic terms, it seems young people here are predominantly depicted as being 'alone together' or together alone. Below, we suggest that this somewhat socially disconnected vision of young people renders them isolated and their digital media practices as potentially isolating. In depicting them this way, stock photography reinscribes the stereotype of kids unduly fixed on their technology and cut off from 'real' social interaction (c.f. Thurlow, 2007).

With this general representational framing in mind, there are other ideologically revealing ways in which young people and digital media are evidently framed. With regard to the wider cultural-political economies of stock photography (see Aiello and Woodhouse, 2016), our dataset was notably gendered, with 41% of images showing only females compared with 23% showing only males. We found a similar imbalance in group images where twice the number of these images showed more girls than they showed more boys. Of the 32% of images with mixed-sex groups, 33% showed more females compared with 16% showing more males. There are economic reasons why image banks favour images of women (Aiello and Woodhouse, 2016), but this overrepresentation clearly warps the picture and potentially perpetuates a sense of young women as problematic or at risk, and/or of communication being woman's work (Cameron, 2000). As a further case in point, we also found evidence of a skewed correlation between portrayed gender and particular uses of technology; for example, one chi-square test revealed significantly ($p = .003086$) more girls than boys taking selfies.

We point briefly to four other visual ideologies underpinning the representational content of stock photography. Perhaps not surprising given our search parameters, 76% of the images in our dataset depicted young people. More interestingly, however, only 11% of the images showed mixed-age groups. We find it striking that 'teens and technology' is thereby seldom conceived in terms of intergenerational contact or familial settings. The social world produced in our dataset was predominantly, perhaps almost exclusively, White: 71% of the images showed White people only, while 12% of the images in our corpus showed people of colour only. This is clearly a disproportionate but also inexplicable distribution. From our preliminary (i.e. pilot) studies, we also have evidence for the ways the images perpetuate and contribute to the normalizing of middle-class identities (Hunziker, 2015); there was also a strong tendency for technology to be framed as an urban phenomenon (Portmann, 2015). Together, and along with the gendering of the images, these factors of age, race, class and urbanism confirm anew (c.f. Aiello and Woodhouse, 2016; Machin, 2004) the often problematic intersectionalities at work in stock photography. As we have indicated, these cultural politics are carried into, and propagated by, the news media.

Central to the work of social semiotics, and what usually distinguishes it from classical semiotics, is an attempt to look beyond representational content – in other words,

beyond what is simply in images (c.f. Thurlow and Aiello, 2007). This is not to say that representational meanings are uninteresting or inconsequential; not at all. However, visual ideologies are as much a matter of genre and style as they are of discourse; they are produced also in the way images are arranged or composed, and in the ways in which they interact and engage emotionally with viewers. In fact, from our stock photography dataset, we find that some of the most telling – indeed, problematic – ways young people and digital media are visualized lie precisely in their compositional meanings and interpersonal meanings.

Compositional meanings

The first compositional meaning we consider here pertains to visual *modality*, which refers to the degree of verisimilitude, or realism, claimed by an image. The vast majority of the photos in our dataset (97%) were designed with medium to slightly low saturation; as such, they appeal to editorial validity and imply that what is represented is somehow real. In the context of the news media, highly saturated images would ordinarily feel too glossy or 'hyper-real'. As we have just shown, stock photos are otherwise quite conceptual in terms of their representational content; this points to their generic appeal and use – in other words, increasing the likelihood of their being deployed multiple times for different purposes. The relatively high modality of their composition or design, however, means that the images retain an aura of realness about them. In other words, we find a contradiction: while the discursive content is somewhat stylized and improbable, the compositional design of photos makes otherwise 'fake' images feel authentic or 'real'.

Another, perhaps more striking compositional meaning at work across our dataset was related to the over-riding prominence of the technology itself, especially vis-à-vis its communicative or social uses. In all but a handful of images, the device (usually a smart phone, tablet or computer) stood out as having what social semioticians call for high *information value*; that is, certain content features are cued as important. One strategy for increasing information value is centring – also a strategy for increasing salience – since things aligned near the centre of an image stand out perceptually, not unlike **bolding** or *italicizing* do in written text. In our dataset, those photos where technology was notably centred tended to use either horizontal alignment (Figure 8) or a kind of 'crosshairs' alignment (Figure 9). Furthermore, 84% of the images made technology highly salient through a number of other combinatorial visual-compositional strategies. One such strategy (in 50% of our dataset) was the *gaze* of represented participants who were shown looking directly at a device. For viewing participants (i.e. people looking at the image), this effectively creates a line or vector, likewise directing their attention to the device. In effect, the design of stock photos again focuses viewers' attention on the technology, which is visually flagged as more important than the user.

Overall, from a compositional standpoint, we find stock photography repeatedly centring the machinery itself in both figurative and literal terms. This iconization or fetishization of technology points to the subtle reproduction of dominant media ideologies (c.f. Gershon, 2010) which may or may not be specific to young people's media practice. In his study of media and semiotic ideologies in the depiction of sexting, Thurlow (2017)

Figure 8. Example of horizontal alignment for centering technology (Photo: Shutterstock, reproduced with permission).

Figure 9. Example of 'crosshair' alignment for centering technology (Photo: Shutterstock, reproduced with permission).

found much the same pattern where little is shown of users' actual communicative practices but rather just the machinery through which these actions are supposedly made possible. In short, the metadiscursive visualization is centred on materiality rather than sociality which, as Hasinoff (2012) demonstrates, can have quite deleterious implications for young people.

Interpersonal meanings

Along similar lines, the interpersonal meanings of stock photography typically produce a sense of young people's digital media practices being somehow single-authored, solitary events, with senders/recipients isolated not only from a narrative context of use (see

above) but also from a sense of mutual exchange. Once again, therefore, digital media is effectively 'de-socialized'. In analytic terms, we see this happening in our dataset through a kind of *double-disconnect*. The first disconnect is accomplished partly through representational meanings and partly through interpersonal meanings. In representational terms, we have already noted how any explicit engagement between represented participants is seldom shown. People are shown as disconnected from each other: either showing only one person or seldom showing people looking at someone else (only 2% of images). Examples include Figures 5, 8 and 9.

The second part of the double-disconnect occurs in the interaction between represented and viewing participants who are also visually disconnected through, for example, contact (or lack thereof) and social distance. To start, our dataset comprised 85% *offer images* which means viewers look at the represented young people, but they do not look back. (*Demand images* are likely less common in newspaper stories which typically seek – or claim to seek – editorial objectivity or neutrality and thus relational detachment.) Young people are thereby shown isolated from each other as well as being always isolated from (mostly adult) viewers – or, eventually, newspaper readers. This feeling is compounded through another compositional feature: the *social distance* between viewing participants (i.e. us) and represented participants (i.e. them), with 71% of all images designed as medium shots. Part of what explains this compositional framing of these particular stock photos is the practical need to show a person and a device which itself may be a product of our 'teens and technology' search parameters. Notwithstanding, it is the combination of different visual strategies, rather than any single strategy, that creates the overall effect of disconnect or detachment.

Our visual content analysis pointed to one other interesting interpersonal meaning; this time, in terms of the emotional tone or style of photos. Of all the images where facial expression could be determined, 73% expressed a decidedly positive mood compared with only 1.5% expressing a clearly negative mood. Indeed, the young people in our dataset appeared to have an altogether limited affective range. This, we think, is also ideologically loaded. The vision of young people as 'techno-slaves' is often also an offset by an over-riding sense of their being 'wired whizzes' (McKay et al., 2005). Viewers are left with the impression that young people's experience of digital media is a solidly happy, uncomplicated one – a vision which flies in the face of the long-standing 'storm-and-stress' mediatized narrative of adolescence (see Porteous and Colston, 1980).

Returning briefly to our news media analysis and the dataset of 139 images, the figures for emotional tone and overall affect change slightly; there were quite a few more 'neutral' facial expressions, while overtly positive or happy facial expressions dropped to 45%. We also find 9% of the news media images (not all from image banks) showing negative facial expressions. What is also interesting is that there were not just fewer 'happy faces' in our news media data; there were also simply fewer faces in general: 39% of all the images in the news media dataset did not show a face, compared to only 8% in the stock photography data. Overall, however, the general effect of the indicative news media imagery remains positive or neutral (or naïve and foolish?), making for another multimodal contradiction when comparing these images with the typical 'doom and gloom' verbal content of the headlines we showed earlier too.

Conclusion

There is no neat extrapolation to be made between the visual ideologies created and promoted by commercial images banks and the ways they are apparently (re)produced in the news media. Although most newsmakers rely on image banks, not everything from image banks is necessarily taken up by the news media. (The 'happy faces' photos we just mentioned might well be a case in point.) It is also beyond the scope of this article to make a direct, fine-grained comparison between our news media data and our stock photography data. The intention for now is rather to highlight the sometimes contradictory but key role news media images play in shaping ideas about young people and digital media, and also to present first-hand evidence for the nature of stock photography and its influential role in feeding the news media with this imagery. The significance of image banks is that they do source so many of the images that backdrop our lives – from advertisements to magazines and newspapers, to university websites and brochures. There is certainly something very particular going on in the way newspapers visually represent both digital media and young people. We have felt this was worth looking at because (a) images clearly matter and (b) no-one else has thought to do so before.

We started out the paper with two news stories, one from the UK's iNews, a version of which was also published the day before under an even more dramatic headline: *There is an epidemic of despair among young people* (https://inews.co.uk/opinion/epidemic-despair-among-young-people-will-admit-phones-play-role/). This iteration of the story was also accompanied by a different image (see Figure 10) sourced from Pixabay, an online open-source (i.e. copyright-free) image bank. In this case, and in keeping with the somewhat lacklustre, hooded young women (shown in the print-only version), we find another perfectly stereotypical, suitably bleak rendition of 'youthness': ripped jeans and Nike trainers, a back alley with graffiti and peeling paint, alone and concealed in a doorway. With just enough jewelry and painted nail shown, the image cues viewers to its being, yet again, a young woman. And a young woman busy messaging (judging by the position of her thumbs) on her cell phone. Although this particular image does seem to be consistent with the doom-and-gloom narrative of the story, we now recognize it as a quintessential visualization of young people and their digital media practices more generally. Among other things, this is a case of technology being centred – literally and figuratively – and visually prioritized over and above any specific communicative uses. Women are again being oddly and inconsistently overrepresented. (This particular story starts with a sex-specific issue but mostly discusses 'teenagers' – indeed, an entire generation of them.) A cultural discourse is surfaced which is heavily shaped by – if not completed, dictated by – the stock photography upon which newspapers nowadays rely so heavily.

From the analysis of our image bank dataset, we find a globalizing visual language (c.f. Machin, 2004) with a 'vocabulary' for speaking about young people and digital media which is at best limited, at worst offensive. (A preliminary study of Arab-language news media and major image banks in the Middle East confirmed how pervasive this vocabulary is; Ben Aziz, 2015.) This is a fairly single-minded visual discourse – a *regime of truth* (Foucault, 1975/1995). For example, we see how visual resources are used to present young people's digital media practices as largely disembedded and/or 'de-socialised'. In

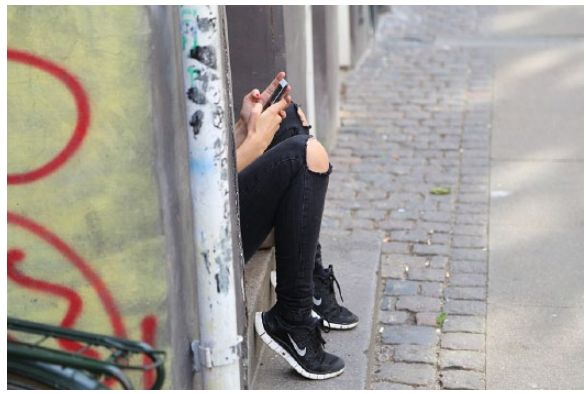


Figure 10. Image used with story in iNews (UK) published 22 October 2017. (Photo: Pixabay, copyright free).

terms of cultural geography, it is a very particular and particularly White, middle-class and urban world of digital media that is produced. Then there is the not so positive – or, oddly enough, 'too' positive – rendition of young people in relationship with their digital media. Either way, we sense a dominant discourse of the mindless 'techno-slave' being reinscribed, all of which happens with largely deleterious consequences in spite of ample, more nuanced empirical evidence to the contrary (see Weinstein, 2018, for a recent example).

Arguably, what it is most troubling is how this regime of truth produced by image banks is potentially taken up and circulated by the news media; for example, in the similarly single-minded over-representation of young women which effectively and problematically genders both communication and (social) media. In this regard, we see first-hand the odd, sometimes contradictory relationship between the verbal copy of newspaper stories and the images selected. More than this, however, we sense a particular representational politics in the news media's deployment of commercial imagery. An image which elsewhere might be used to sell clothing resonates very differently when inserted into a news story. As such, there is a problematic blurring of the kinds of editorial 'realities' that are widely expected in the news (i.e. the reporting of facts) and the kinds of generic representations and free-form, creative imaginations usually peddled by image banks. Either way, it seems, young people and their digital media practices do not come off well.

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Notes

1. In spite of the often prohibitive cost of securing permissions, we have done our best to reproduce as much visual data as possible. In some cases the images in our dataset were sourced from from other, more affordable image banks (e.g. Figures 2 and 7). In other moments, we provide weblinks to original newspaper stories.
2. For some news stories, we could not identify the image source from the news story itself but were able to determine the image's origin through a subsequent reverse image search using Google Images. In such cases, information about the image source was added to the data retroactively. Overall, we managed to identify the image source of all but 8% of our dataset.
3. Given the collaborative nature of our original research group, we used a range of approaches for collecting information about our images, including Image URL, Image ID and all keywords. For Alamy, we saved all the relevant stock image data manually over the course of 2 days. For downloading and saving relevant stock image data from Getty Images, we used a custom scraping script. For this, we first inspected the structure of Getty Images' search result page(s) to determine how to extract target elements (e.g. image URL, image ID and image keywords). Using the Node.js module x-ray (git://github.com/lapwinglabs/x-ray.git), we then developed a custom scraper allowing us to retrieve these elements and save them as a .csv file. Next, we used a JavaScript-based parser to download and save all images. With our custom scraper, we were able to automatically name all our files using a clear naming structure reflecting dataset, image bank, search result position and image ID. This script was developed for us by Patrick Fiaux who has not published the code but has given us permission to share it with others on request. For downloading and saving stock image data from Shutterstock, we used a custom automation script, accessing the Shutterstock API for extracting target elements. This Node.js script, developed by Tobias Fuhrimann, is available here: https://github.com/mastertinner/shuttrstockr.

References

Aiello G (2016) 'Taking stock'. Available at: http://ethnographymatters.net/blog/2016/04/28/taking-stock/

Aiello G and Parry K (2019) *Visual Communication: Understanding Images in Media Culture.* London: SAGE.

Aiello G and Woodhouse A (2016) When corporations come to define the visual politics of gender: the case of Getty Images. *Journal of Language and Politics* 15(3): 352–368.

Androutsopoulos J and Tereick J (2015) YouTube: language and discourse practices in participatory culture. In: Spilioti T and Georgakopoulou A (eds) *The Routledge Handbook of Language and Digital Communication*. New York: Routledge, pp. 354–371.

Bell P (2001) Content analysis of visual images. In: Van Leeuwen T and Jewitt C (eds) *The Handbook of Visual Analysis*. London: SAGE, pp. 10–34.

Bounegru L, Gray J, Venturini T, et al (2017) A field guide to 'fake news' and other information disorders. Public Data Lab. Available at: https://fakenews.publicdatalab.org/

Cameron D (2000) Styling the worker: gender and the commodification of language in the globalized service economy. *Journal of Sociolinguistics* 4(3): 323–347.

Dürscheid C and Siever CM (2017) Jenseits des Alphabets – Kommunikation mit Emojis [Beyond the alphabet – communication with emojis]. *Zeitschrift für germanistische Linguistik* 45: 256–285.

Fairclough N (2010) *Critical Discourse Analysis: The Critical Study of Language*. 2nd ed. London: Routledge.

Foucault M (1975/1995) *Discipline and Punish: The Birth of the Prison*. London: Vintage Books.

Frosh P (2003) *The Image Factory: Consumer Culture, Photography and the Visual Content Industry*. Oxford: Berg.

Frosh P (2013) Beyond the image bank: digital commercial photography. In: Lister M (ed.) *The Photographic Image in Digital Culture*. London: Routledge, pp. 131–148.

Georgakopoulou A and Spilioti T (eds) (2015) *The Routledge Handbook of Language and Digital Communication*. New York: Routledge.

Gershon I (2010) Media ideologies: an introduction. *Journal of Linguistic Anthropology* 20: 283–293.

Glückler J and Panitz R (2013) *Survey of the Global Stock Image Market 2012*. Heidelberg: GSIM Research Group. Available at: http://www.stockimagemarket.uni-hd.de/

Gürsel Z (2016) *Image Brokers: Visualizing World News in the Age of Digital Circulation*. Berkeley, CA: University of California Press.

Hasinoff AA (2012) Sexting as media production: rethinking social media and sexuality. *New Media & Society* 15(4): 449–465.

Herring SC (2001) Computer-mediated discourse. In: Schiffrin D, Tannen D and Hamilton HE (eds) *The Handbook of Discourse Analysis*. Malden, MA: Blackwell Publishers, pp. 612–634.

Hunziker M (2015) *Normalizing the Middle Class: A Visual Discourse Analysis of New Media Representations in Mediatized Stock Photography*. MA Thesis, University of Bern, Switzerland.

Irvine JT and Gal S (2000) Language ideology and linguistic differentiation. In: Kroskrity P (ed.) *Regimes of Language*. Santa Fe, NM: School of American Research Press, pp. 35–83.

Jewitt C and Oyama R (2001) Visual meaning: a social semiotic approach. In: Van Leeuwen T and Jewitt C (eds) *The Handbook of Visual Analysis*. London: SAGE, pp. 134–156.

Kelly JP (2009) Not so revolutionary after all: the role of reinforcing frames in US magazine discourse about microcomputers. *New Media & Society* 11(1–2): 31–52.

Kress G and Van Leeuwen T (2001) *Multimodal Discourse: The Modes and Media of Contemporary Communication*. London: Hodder Arnold.

Machin D (2004) Building the world's visual language: the increasing global importance of image banks in corporate media. *Visual Communication* 3(3): 316–336.

Machin D and Mayr A (2012) *How to Do Critical Discourse Analysis: A Multimodal Introduction*. London: SAGE.

Machin D and Polzer L (2015) *Visual Journalism*. London: Palgrave Macmillan.

McKay S, Thurlow C and Toomey Zimmerman H (2005) Wired whizzes or techno-slaves? Young people and their emergent communication technologies. In: Williams A and Thurlow C (eds) *Talking Adolescence: Perspectives on Communication in the Teenage Years*. New York: Peter Lang, pp. 185–203.

Pariser E (2011) *The Filter Bubble*. London: Penguin.

Porteous MA and Colston NJ (1980) How adolescents are reported in the British press. *Journal of Adolescence* 3: 197–207.

Rose G (2010) *Doing Family Photography: The Domestic, the Public and the Politics of Sentiment*. Farnham: Ashgate.

Seargeant P and Tagg C (eds) (2014) *The Language of Social Media: Identity and Community on the Internet*. Basingstoke: Palgrave Macmillan.

Stöckl H (2020) Multimodality and mediality in an image-centric semiosphere – a rationale. In: Thurlow C, Dürscheid C and Diemoz F (eds) *Visualizing Digital Discourse: Interactional, Institutional and Ideological Perspectives*. Berlin: De Gruyter.

Tan S, O'Halloran KL, Wignell P, et al. (2018) A multimodal mixed methods approach for examining recontextualisation patterns of violent extremist images in online media. *Discourse, Context & Media* 21: 18–35.

Technavio (2016) Global still images market 2016–2020. Available at: https://www.technavio.com/report/global-miscellaneous-still-images-market?utm_source=T3andutm_medium=BWandutm_campaign=Media

Thurlow C (2007) Fabricating youth: New-media discourse and the technologization of young people. In: Johnson S and Ensslin A (eds) *Language in the Media: Representations, Identities, Ideologies*. London: Continuum, pp. 213–233.

Thurlow C (2014) Disciplining youth: language ideologies and new technologies. In: Jaworski A and Coupland N (eds) *The Discourse Reader.* 3rd ed. London: Routledge, pp. 481–496.

Thurlow C (2017) 'Forget about the words'? Tracking the language, media and semiotic ideologies of digital discourse: the case of sexting. *Discourse, Context and Media* 20: 10–19.

Thurlow C (2018) Digital discourse: locating language in new/social media. In: Burgess J, Poell T and Marwick A (eds) *The SAGE Handbook of Social Media.* NewYork: SAGE, pp. 135–145.

Thurlow C and Aiello G (2007) National pride, global capital: a social semiotic analysis of transnational visual branding in the airline industry. *Visual Communication* 6(3): 305–344.

Thurlow C, Dürscheid C and Diemoz F (eds) (2020) *Visualizing Digital Discourse: Interactional, Institutional and Ideological Perspectives*. Berlin: De Gruyter.

Turkle S (2011) *Alone Together: Why We Expect More from Technology and Less from Each Other*. New York: Basic Books.

Vaisman C (2014) Beautiful script, cute spelling and glamorous words: doing girlhood through language playfulness on Israeli blogs. *Language and Communication* 34: 69–80.

Van Leeuwen T (2005) *Introducing Social Semiotics*. London: Routledge.

Wardle C (2017) Fake news. It's complicated. *First Draft*, 16 February. Available at: https://firstdraftnews.com/fake-news-complicated/

Weinstein E (2018) The social media see-saw: positive and negative influences on adolescents' affective well-being. *New Media & Society* 20(10): 3597–3623.

Woolard KA and Schieffelin BB (1994) Language ideology. *Annual Review of Anthropology* 23: 55–82.

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