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Identifying the Routes by which Children View Pornography Online: Implications for Future Policy-makers Seeking to Limit Viewing

Report of Expert Panel for DCMS

Submitted on 12th November 2015

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1 Introduction

Terms of reference

This report represents the collective views and expertise of a panel of academic experts convened by the Department for Culture, Media and Sport. Panel members drafted individual responses to specified questions, then met in a policy forum on the 2nd March 2015. The panel was initially tasked with providing ‘an evidence-based narrative on children’s routes to viewing hard-core pornography online and identifying challenges and opportunities for future policy-makers seeking to limit young people’s viewing of hard-core pornography online’. To clarify the scope of our discussions, we delimited the terms of debate more narrowly. Specifically, the panel agreed that this report should cover:

- Viewing of pornography (rather than ‘hard-core’ pornography), where this is defined as ‘Sexually explicit media that are primarily intended to sexually arouse the audience’ (Malamuth 2001);
- By children¹ up to 18 years old, even though much of the research summarised below covers just a portion of this age group;
- Using Internet or mobile technologies (rather than just ‘online’) insofar as this allows discussion of materials transmitted directly from one child to another using a phone or other mobile device without requiring an Internet connection. For brevity, we continue to use the word ‘online’ when considering findings, but individual studies may be discussed with reference to more specific types of connectivity.

The report that follows was compiled by the lead author, with all panel members contributing to its drafting. Where possible, we have sought to indicate the extent of agreement or dissent in the research base in order to clarify the weight of opinion behind the various claims and recommendations.

Structure of the report

Incorporating the terms of reference, primary objectives for the panel were to set out:

- What is known about how children are viewing pornography both in terms of deliberate access and inadvertent exposure, and about what they are viewing;
- The challenges and opportunities these access routes hold for policy-makers seeking to limit viewing of pornography using mobile and Internet technologies;

¹ We recognise that older teenagers would object to being described as ‘children’, but for the purposes of this report, we utilise the term to indicate both that we are focusing on under-18s (thus not teenagers of 18 and 19 years, or young people, which might include those over 20). It is also consistent with usage in EU legislation and the UN Convention on the Rights of the Child.

- The considerations that future governments should take into account in developing effective policy solutions to limit children’s viewing of pornography using mobile and Internet technologies.

This report is structured to address these objectives and incorporates some additional information, such as what we know about the harms associated with viewing pornography, our understanding of the wider societal context in which these arise and consideration of other policy goals which may align or conflict with measures directed at limiting the viewing of pornography by children. Given the very short timescale for this process, we have not covered every question initially set out in the brief; further information can be provided on any part of this report if required.

2. What is known about children’s experience of viewing pornography via Internet and mobile technologies?

Research context

Internet and mobile device use have become increasingly significant to children’s lives. Ofcom’s 2014 study of parents and children’s media use suggested that 5-15 year olds spend an average of 12.5 hours a week using the Internet, with the oldest age-group in that study (12-15) spending more than 17 hours a week online (Ofcom 2014). At the same time, we are seeing a trend towards ever greater use of portable and personal devices which, unlike the family PC, can easily be used in private, often outside the home and with friends, and are more difficult for parents or carers to supervise. Ofcom’s survey data suggest that 71% of children aged 5-15 have access to a tablet computer, whilst 4 in 10 of this age group own their own mobile phone, rising to 65% of those aged 12-15 (Ofcom 2014). The Internet is still most commonly accessed via PCs but mobile and tablet access is very much on the rise, and for older age groups, such as those over 12, this constitutes a particularly important mode of access. Despite this, and with important implications for the efficacy of current ISP filtering arrangements, the home remains the most important site of access.

It is important to note at the outset that the vast majority of children’s online experiences and interactions are not about sex or pornography, and that for most, their Internet and technology use deliver significant benefits in terms of social, educational and creative engagement. They rely on their digital devices to watch videos, download music, play games and communicate with friends, with large numbers using the Internet daily to help with school work. However government chooses to respond to the information presented here about the risks of seeing sexual content online, it is vitally important that harms and benefits are weighed up appropriately, and that the potential for positive experiences is not undermined by a heavy-handed and restrictive approach.

Research limitations

Although there is a wealth of excellent academic research to draw on, many studies have significant limitations which ultimately restrict our ability to provide definitive answers to many of the questions we were asked. Specifically:

- It is ethically problematic to ask children explicit questions about sex and pornography, especially in younger age groups, and would be illegal to provide children with sexually explicit images, even as part of a research project.
- This means direct experimental studies about effects of pornography are not possible. For ethical reasons you could not, for example, carry out randomised controlled trials comparing groups of children exposed or not exposed to pornography.
- Studies of effects of pornography therefore consider correlational relationships rather than being able to establish causation. This is particularly important to note when considering evidence of harms being 'caused' by pornography.
- Longitudinal studies may provide better information than examining correlations alone, but are expensive and relatively uncommon, and may still not be able to establish causation.
- Further, issues of social desirability mean that any behaviour which may attract social censure are typically under-reported in research studies. Differential social pressures may also mean that boys and girls, or children from different cultural groups, show variations in under- or over-reporting of certain experiences or feelings.
- In addition, the array of relevant research studies cover experience in many different countries and date back ten or even fifteen years. Although these studies are useful in helping us to understand the broader picture, such as the correlation between viewing pornography and behavioural traits or attitudes, the differences in technological, regulatory and cultural contexts mean they may not all be so useful in arriving at judgments of prevalence for UK children. For this reason, we endeavour to focus on recent UK evidence wherever possible.

These caveats are not intended to undermine the value of this expert review, but rather to explain the caution inherent in some of the claims that follow, which may demonstrate rather less 'certainty' than is expected in policy discussions.

Prevalence

A range of studies examine children's viewing of pornography via both online and offline means. They describe experiences across many different countries. Given differences in methodology, definitions and cultural context, it is no surprise that we lack a clear consensus as to the proportion of children viewing such material, beyond the conclusion

that many children and young people view pornography at some time in their young lives (Horvath et al 2013).

For the purposes of this review, we are aware it would be helpful to offer unambiguous evidence of prevalence across the entire age group. However, we have not been able to find any recent UK studies which provide clear figures for online and offline viewing of pornography for *all* children up to the age of 18. Two of the most recent UK studies which provide valuable insight cover the younger and older age groups separately (9-16 years old in the UK portion of the EU Kids Online survey or its follow-up version Net Children Go Mobile, and 16-24 years old in the ongoing study by Coy and Horvath²). Although these constitute the most relevant and recent academic studies it should also be noted that given the ethical limitations on asking young children questions about pornography, the EU Kids Online studies only ask about sexual images, “for example, showing people naked or people having sex” and thus may also include data about viewing content which might not fit the clear definition set out at the start of this report (Livingstone et al 2011: 49). We also draw heavily on the extensive 2013 review by Miranda Horvath and colleagues for the Children’s Commissioner for England, summarising the effects that access and exposure to pornography have on children and young people (Horvath et al 2013).

In measuring prevalence, it is possible to look at exposure to pornography over the course of a child’s life up to 18, or to look at a snapshot of their experience over a particular period of time. Research on these issues tends to draw on either surveys of large samples of children, or smaller scale focus groups or interviews. A third approach is to rely on industry-provided viewing figures such as Nielsen’s Netview, which offer insights into which websites children are actually visiting. The studies which address exposure at any point up to 18 and include pornography viewed both online and offline, unsurprisingly provide the highest figures. As Horvath et al (2013) note, such studies suggest that anywhere between 43% and 99% of under-18s are exposed to pornography as they grow up, with exposure rates typically higher for boys. An early UK study from 2004 suggested that 57% of 9-19 year olds had encountered pornographic material online (defined as “nude people, rude and sexy pictures”, for the younger respondents) (Livingstone & Bober 2004).

Those studies which aim to measure only online access or access over a defined time period unsurprisingly produce lower figures. For example, the recent Net Children Go Mobile report states that 17% of UK 9-16 year olds say they have seen sexual images online or offline within the past twelve months, a figure which is notably lower than the 28% across Europe as a whole, and also lower than the figure of 24% reported in 2010 for the UK (Livingstone et al 2014). An earlier EU Kids Online survey suggests that 14% of 11-16 year olds have seen sexual images online (Livingstone et al 2011). It should be reassuring to note

² Unpublished research paper, based on a survey commissioned for a BBC3 documentary (Porn, What’s the Harm? Thursday 10th April 2014). Papers are currently being prepared for publication.

those in the youngest age groups studied are very unlikely to say they've seen sexual images in the past year – just 2% of 9-10 year olds - but the proportion rises quickly amongst those aged 11-12 (9%) and reaches 25% amongst both 13-14 and 15-16 year olds (Livingstone et al 2014).

The third approach is to track Internet users' online habits. Market research companies such as Nielsen recruit large representative panels of users who install meters on their laptops or PCs. Using this approach the UK Authority for TV on Demand (ATVOD) commissioned an analysis of data held by Nielsen Netview to determine how many children are accessing adult websites, and whether those websites are based (and therefore regulated) in the UK. Their figures showed that during December 2013, approximately 200,000 children aged between 6 and 15 accessed adult websites, of whom 44,000 were of primary school age. ATVOD suggest this equates to around 6% of UK 6-15 year olds, and almost 3% of primary age children (ATVOD 2014).

If it is hard to obtain a consensus on the number of children accessing pornography, it is also surprisingly complicated to determine whether pornographic content is viewed by children 'online' or 'offline'. This has arguably become more difficult to ascertain as our media experiences converge and blend across a number of different platforms. When we consider that books, films, and TV can all now be consumed on digital devices, sometimes streamed, sometimes downloaded, or that photos and links can be exchanged by Bluetooth or in a mobile messaging app, it is not surprising that it may not be immediately clear to children which content they are accessing via the Internet or a mobile network, or offline. For this reason, several recent studies such as those run under the EU Kids Online framework have instead asked children how they came to see sexual images, listing a range of different activities, from books and magazines to messaging apps and chat-rooms. This means that it is not always absolutely clear when sexual images have been observed in analogue or digital form, and if digital, whether over the Internet.

It might be expected that most sexual images would be viewed via pornographic websites. However, recent UK and EU surveys suggest that this is not the primary route, and that traditional mass media still play an important role in children's exposure. Indeed the 2010 EU Kids Online survey results revealed that mass media such as films and magazines were then a more common source of viewing sexual images (defined as naked people, or people having sex) than websites, whilst more recent figures suggest these sources are still on par with digital routes. This is a useful point to remember: sexual imagery is rife within wider popular culture, and some of the most talked about media events, whether series like Game of Thrones, films such as Fifty Shades of Grey or games such as Grand Theft Auto contain not only scenes of explicit simulated sex acts but even violent sexual content. Whether such media are accessed 'offline' or 'online', it is quite possible that the sexual content children and young people are exposed to most frequently is actually a component of ordinary everyday mainstream culture rather than accessed illicitly via adult websites, ads or

services. We will return to this point when addressing the different routes and technologies by which children access sexual images online.

Social context

In addition to understanding how many children view pornography, it would be useful to understand more about why and how they do so. Do they encounter such materials accidentally and upsettingly whilst trying to do something else? Do they access it deliberately and privately, out of curiosity for or for some other purpose? How is it used in the context of peer group bonding or emergent sexual relationships? It would also be helpful to know more about what type of sexual content is being viewed - are children seeing less explicit images of nudity or sex, are they viewing graphic non-simulated sex, or even illegal extreme pornography?

Ethical and methodological challenges make it difficult to be sure what type of content is seen. The 2010 EU Kids Online Survey data for the UK indicates that the most common sexual content seen online is images or video of naked people (11% of all 11-16 year olds using the Internet), followed by images or video of genitals or people having sex (both 8%). Images or video that show sex in a violent way is viewed least often, with 2% of respondents saying they have seen such material (Livingstone et al 2011).

In terms of reasons for viewing, research suggests that more children are likely to report accidental rather than deliberate viewing of pornography. But as Horvath et al (2013) point out, rates of unwanted exposure vary considerably across studies with figures ranging from 4% to 66% of children and young people reporting this. Figures from a 2004 UK survey suggested that nearly six in ten 9-19 year olds had then seen pornography online, and that in the majority of cases, this viewing was unintentional, largely via pop-up adverts, unwanted websites or spam (Livingstone and Bober 2004). Given the pace of digital and mobile technological change, it is dangerous to extrapolate too much from figures that are now over ten years old, but it is hard to find any suitable figures that elucidate the *current* experience of UK children with specific regard to intentional/accidental viewing. One ongoing study in the UK suggests that amongst 16-24 year olds, respondents most commonly reported accessing pornography when they hadn't intended to (37.4%), with the second biggest group suggesting that others showed it to them (24.9%) whilst 21.6% said they looked for it on purpose (Coy and Horvath, in progress). However, some caution should be exercised in interpreting these figures as some respondents may feel embarrassed to admit that they deliberately looked for pornography, whilst the desire to categorise viewing as either deliberate or accidental may over-simplify motivations and experiences.

The mention in Coy and Horvath's results of respondents who had viewed pornography as result of others showing it to them is important. Although this may signify no more than situations where friends share explicit material as a way of bonding, or where partners use

pornography together, there is also evidence that a third category of experience exists, wherein some individuals feel persuaded or even coerced into viewing pornography. One study of college students (18+) reported that 1.5% of men and 6.6% of women in their sample had been pressurised by others to view pornographic materials (Romito and Beltramini 2011). This is in line with other recent UK studies indicating that teenage girls seem to be experiencing unacceptable sexual coercion at the hands of their partners, ranging from girls being persuaded to send naked or explicit photos of themselves (Ringrose et al 2012; Phippen 2012) to abuse and physical attack (Barter 2015). From a policy perspective it is worth considering which of these contexts for viewing pornography are most significant: limiting the exposure of children and young people who do not wish to view pornographic materials may be somewhat easier than preventing access by those determined to seek it out, whilst if others are being coerced into viewing pornography, this suggests social and educational interventions are needed.

It is possible to drill down further into some of these questions. Although often assumed to be a solitary pursuit, there is good evidence to suggest that the viewing of pornography is also a common shared activity. In their review for the Children's Commissioner for England, Horvath et al (2013) summarise available research to suggest that boys are more likely to view pornographic material when alone, although many children, male and female, watch pornography with their peers. The reasons given for watching with others include achieving closer social bonds, gaining social status or encouraging sexual engagement with desired sexual partners. In many cases, initial exposure to such materials is led by boys rather than girls. Those who seek out pornography state a variety of reasons for use, ranging from desire for sexual arousal to simple curiosity or increasing understanding about sex. There is also some evidence of children sharing pornography, such as exchanging website addresses or content via the mobile phones or the Internet, as well as creating their own images of sexual content (sexting) whether this be for personal consensual use or illegal and humiliating sharing.

Sexing is an inherently social activity. Research suggests that between 4% and 17% of young people have sent or received sexually explicit images and messages or "sexts", a practice that is more common amongst older teens, but with little variation according to gender (Horvath et al 2013). More young people say that they have received sexts than sent them, whilst young men are more likely to request images, and young women more likely to feel pressured to comply. There is some UK evidence that girls and young women are disparaged whether or not they cooperate (Phippen 2012). Although such material may be created and exchanged between romantic partners, sexts are also often, possibly more often, exchanged outside a relationship, either between individuals hoping to start a relationship or between friends sharing photos of their peers or partners for reasons which may be harmless or humiliating (Lenhart 2005; Phippen 2012). Although the greatest public policy concern here would seem to be the illegal sharing photographs of a minor, the

safeguarding implications of complex sexual and social behaviours which may or may not involve coercion or sexual harassment are deserving of significant attention.

Means of access

The research cited above reveals that many under-18s, mainly teenagers, are viewing or are exposed to pornography, that they do so for a variety of reasons relating to emerging sexual identity or social bonding, and that they do so both alone and with friends. The one question we have yet to answer is how they access such material – does the Internet play as significant a role as media concern would suggest? If they are using digital devices, which ones, and via what apps or services?

The most recent figures suggest that mobile phones and the Internet may be playing more of a role. Results from the Net Children Go Mobile study, which repeated the earlier EU Kids Online survey in 2013, suggest that most exposure in that year was reported as occurring in television and films or social network sites, with the range of Internet-enabled options now matching traditional mass media (TV, films, videos and DVDs) as the most common sources. To return to the question of prevalence, 7% of the 9-16 year old children surveyed had seen sexual images on social networks in the past year, 6% had seen them on TV or in a film, 5% had seen them in a magazine or book, or as pop-ups on the Internet (Livingstone et al 2014; see table 25, p. 43, reproduced with permission below). As might be expected, more children from older age groups report such experiences, with 13% of 15-16 year olds seeing sexual images on social network sites, compared to just 4% of 11-12 year olds and none of those in the youngest age group of 9-10 years. Of note is that the few youngest children who did report seeing sexual images reported doing so either on TV or in films or via video-sharing platforms such as YouTube.

	Age				All
	9-10	11-12	13-14	15-16	
%					
In a magazine or book	0	0	6	12	5
On television, film	1	0	7	15	6
On a video sharing platform	1	0	2	13	4
On a photo sharing platform	0	0	3	9	4
By pop-ups on the internet	0	3	11	4	5
On a SNS	0	4	7	13	7
By instant messaging	0	0	1	11	3
In a chatroom	0	0	1	0	0
By email	0	0	0	0	0
On a gaming website	0	0	0	0	0

(Livingstone et al 2014; Table 25, p. 43, reproduced with permission of the lead author.)

NCGM: Q36: If you have seen images of this kind, how did it happen? (Multiple responses allowed).
 Base: All children who use the internet.

Rather than dwelling too long on the difficult distinction of whether or not pornographic content is technically viewed via the Internet, a mobile phone or offline, it may be instructive to consider in more detail the variety of means by which under-18s could see such material. Policy makers and academics in this field are familiar with the role of traditional mass media means which include films, television, books and magazines, but galloping innovation in digital technologies means that there are now a great array of tools, channels and apps by which content can be created, viewed or exchanged. At the policy forum, we asked our expert panellists to list the variety of digital means by which children and young people could *conceivably* view pornographic images as existing research does not provide a very granular account. This list also provides some insight into the range of industry stakeholders who might play a role in any new moves to restrict children's access to adult content. Their suggestions included:

- Pornographic websites;
- Photo or video-sharing platforms;
- Search engines;
- Adverts;
- Interpersonal messaging apps and services;
- Social network sites;
- Peer-to-peer portal sites and torrent services for downloading films and videos;
- Mobile and tablet apps;
- Games;
- Physical sharing of devices or USB sticks;
- Dark web.

This is not an exhaustive list, there is some overlap between categories and given the speed of technological advance, other channels may emerge as important routes to access on even a short timescale. We will consider each of these briefly in turn to highlight relevant empirical evidence of use, as well as technical characteristics which may affect the range of feasible policy interventions.

Pornographic websites

Studies analysing user statistics and page views have suggested that 4% of the most frequented websites in the world are pornographic (Ogas 2011). UK Internet users spend a significant amount of time and money on adult websites. ATVOD's recent study suggested that 23% of all UK residents who went online using a PC or laptop in December 2013 visited an adult website, spending more than 1.4 billion minutes on pornographic websites that month alone (ATVOD 2014).

The 2010 EU Kids Online survey asked whether respondents had seen sexual images ‘on an adult or X-rated website’: 4% of 13-14 year olds said they had seen sexual images via such routes over the past year, and 9% of 15-16 year olds. The recent ATVOD study offers less detailed figures, but indicates that around 6% of 6-15 year olds viewed pornographic websites within just one month in 2013, potentially suggesting higher viewing figures over the course of a year.

In theory, major pornographic websites are relatively straightforward to index manually for the purposes of compiling filtering blacklists. The content is unambiguous, the URLs of the biggest brands are stable, and they are easily identifiable. However whilst major websites are stable and easy to block, there exist many smaller, more specialised sites that would require much greater effort to index manually for inclusion in a filtering scheme. The automated alternative is also not straightforward: it is much more difficult for algorithms to identify previously un-indexed content because distinguishing pornographic content from, say, artistic content is extremely challenging without a human appreciation of context. For this reason, even the best filters still suffer from both over and under-blocking of pornographic websites.

Photo and video-sharing platforms

Photo and video-sharing sites have become increasingly popular sources of entertainment, with the largest players like YouTube, Vine, Imgur, Flickr and Instagram now household names. In the UK, YouTube is the fourth most popular site according to Alexa³, with both Imgur and Instagram featuring in the top thirty. What distinguishes these sites is their role as spaces for the easy sharing of user-generated content, whether that be snippets of children’s programmes, step-by-step hair-dressing instructions or amateur (or even professional) pornography. The incredible variety of content is one of the features that make these sites so popular – whatever you are looking for, the chances are that someone else has posted it. On the flip side, the sheer amount of content uploaded to these sites (300 hours of video uploaded to YouTube every minute⁴) renders them virtually impossible to moderate. Instead the most popular sites listed above all have policies or community standards that clearly prohibit the posting of pornographic content, with the exception of Flickr, which asks users to self-moderate by choosing a ‘restricted’ filter for adult-only content. In practice, this has not stopped these platforms becoming host to pornographic content and it is notable that in recognition of the difficulties of ensuring a completely child-safe experience via their main platforms, both Vine and YouTube have recently chosen to launch child-friendly versions of their apps (YouTube launched an app for both Android and iOS - YouTube Kids - in the US on February 23rd 2015, the VineKids iOS app launched on 30th January 2015). These new services appear to be targeted at younger children and are

³ Alexa.com rankings for top sites in the UK generated on 9/3/15

⁴ <https://www.YouTube.com/yt/press/en-GB/statistics.html>

unlikely to appeal to teenagers. Given that it is precisely older teenagers who are more likely to view sexual content via video or photo-sharing platforms, such new measures are more likely to prevent inadvertent access by younger children rather than prevent access, accidental or deliberate, amongst older children. The Net Children Go Mobile study suggested that 13% of 15-16 year olds had viewed sexual content on a video-sharing platform in 2013, as against just 1% of 9-10 year olds (Livingstone et al 2014).

Search engines

Although search engines might be most obviously used to identify generic or special-interest porn websites, they can also be used as a source of sexual images in their own right, via the thumbnail images which are shown in an image search. The most popular search engines all offer 'safe-search' options which filter out explicit images and text. Google and Bing, for example, both offer two SafeSearch options of which Moderate SafeSearch aims to filter out adult images or videos. This is the default setting for both search engines. An even more stringent Strict setting is available which blocks explicit text. However these safety tools can easily be bypassed by changing user settings and experience suggests that many parents are unaware of them, and are therefore unlikely to check. It should also be noted that search engine filters are a significant source of over-blocking, given the imperfection of automated filtering.

Adverts

Pop-up adverts have been identified as a significant source of unwanted sexual images by under-18s. The UK Net Children Go Mobile study found these to be the most common source of seeing sexual images amongst the 13-14 year old age group, with 11% stating that they had encountered material this way in 2013 (Livingstone et al 2014). Crucially, such adverts appear without any intent of the user. Instead they are new web browser windows generated to automatically open and display advertisements when a particular page or page-element is opened. Most Internet browsers now offer pop-up blocking in their settings, and add-on tools such as ad-blockers will offer further protection. On the occasions that pop-up windows are needed as part of a website's functionality, these tools usually provide more granular options, such as enabling pop-ups from particular sources. With the advent of pop-up-blocking as a core browser function, more and more sites are now moving to 'in-line' or banner ads, which are embedded within the web page. To get rid of these, Internet users need to download additional ad-blocking tools. However, one problem that might be faced by younger users is that certain types of content, such as pirated free music or games, are more frequently associated with the use of pop-ups and in-line ads, and should a child click on even just one of these, a cascade of further adverts can be served. The least reputable torrent sites are particularly problematic sources of such adverts

There is no statutory ban on advertising pornography in digital media in the UK, and conduct of UK websites and UK advertisers is governed by the self-regulatory Advertising Codes

produced by the UK Committees of Advertising Practice⁵. An advert for a pornographic service or website would likely be deemed in breach of these codes if it contained overtly sexual imagery and was delivered in an untargeted medium, such that it would be likely to be seen by children. There are two challenges here. The first is that the most rigorous forms of age verification are not routinely used to determine the age of Internet users, with the exception of a few licensed product areas such as online gambling. Instead, adverts are usually served on the basis of behavioural profiling, namely the online habits of the device user. This obviously can result in the serving of adult-only adverts either if the device is shared and regularly used by adults in the family or if a minor is accessing adult content or sites with little incentive to offer accurate profiling. Some forms of behavioural profiling are even based on data gathered from a single IP address, which may be shared by several users and devices in a single household. The second difficulty with regulating this particular sector is the sheer array of stakeholders. The display of just one pop-up ad on a website will likely have involved business transactions between the website publisher who wants to generate money to pay for content, an advertiser who wants to sell a product, an ad network, such as Google AdSense who run the infrastructure required to serve the adverts, and quite possibly other advertising analytics businesses who purchase behavioural data to sell behavioural profiling of Internet users. Given the complexity of this ecosystem and the fact that many adverts on foreign websites will be beyond UK advertising regulation, determining that ads with pornographic content are likely to be viewed only by adults may pose a significant practical and regulatory challenge.

Interpersonal messaging apps and services

For UK children aged 12-15, talking with their friends is the activity they most value online (Ofcom 2014). This is facilitated by a wide array of apps, ranging from real-time video chat services such as Skype or FaceTime, to friend-to-friend messaging apps such as Facebook's Messenger, WhatsApp or Snapchat, to public group chat apps or services such as traditional online chat-rooms or new apps like Firechat or YikYak which connect up proximate users via phones' Bluetooth or wireless signals. These services are used by large numbers of children, especially those in their early teens. Ofcom's most recent survey of media use attitudes showed that 26% of 12-15 year olds have a Snapchat profile and 20% have a WhatsApp account despite its ostensible minimum user age of 16 (Ofcom 2014). The Net Children Go Mobile survey suggests that such messaging services are particularly important to older teenage girls, with 68% of 13-16 year olds using them daily, compared to only half of all boys in the same age range (Livingstone et al 2014).

In each of these cases, content is as hard to regulate as would be a real-time face-to-face conversation. As more and more services are encrypting connections by default, only the conversation participants are able to view the content of the communications. Participants,

⁵ <http://www.cap.org.uk/About-CAP.aspx>

whether under or over 18 can discuss whatever matters they wish, share photos or videos of whatever they want, and can even choose not to leave any digital trail. So long as content is shared consensually between those participating in the chat, it is unlikely to be reported and thus removal or blocking of the images will happen only rarely. Removal or blocking is also unlikely to occur if one party feels pressured by the other to participate. Perhaps unsurprisingly, person-to-person direct messaging does seem to be a way to share sexual images. However this is mainly for those in the older age groups: according to the most recent figures, 11% of 15-16 year olds in the UK saw sexual images on instant messaging in 2013 compared to just 4% of all 9-16 year olds (Livingstone et al 2014). Although in theory these figures could include sexting, more detailed questions regarding this phenomenon in the same survey suggest that sexting is not the only source of sexual images viewed by children using messaging services and apps.

As noted earlier, sexting is a phenomenon deserving of greater policy consideration. It is relevant here in the sense that it usually occurs via texting or mobile messaging apps. There is a concern that more ephemeral communication platforms such as Snapchat may even encourage such behaviour, making participants believe that they can send sexually revealing images without any danger of them being saved and re-circulated later. This much-vaunted feature of Snapchat can be bypassed if one user takes a screenshot and saves the result. A more basic point is that the increasing ubiquity of mobile devices and tablets mean that it is relatively easy for teens to take such pictures of themselves or others, with little perceived danger of any adult oversight.

In addition to worries about sexting, there do seem to be wider concerns about the use of instant messaging apps both as a source of bullying or the exchange of illegal images (the UK has already seen the prosecution of individuals for receiving images of extreme pornographic acts via WhatsApp⁶). This might seem to suggest that it would be an easy win to restrict or forbid their use. However their central role as a much-valued platform for communicating with friends means that any attempts to restrict children's access to these would be hugely unpopular and practically impossible. Although age restrictions are already in place with some of these services these do not seem to be well-observed, and the greatest imperative would seem to be educating parents and children about the risks of such applications if used for sexual purposes.

Social Network Sites (SNS)

Social networks continue to be well-used, with nearly half of all 9-16 year olds visiting a social network profile every day, a figure which rises above 70% for those aged 13-16 (Livingstone et al 2014). The most popular site continues to be Facebook, although there is

⁶ R v Ticehurst, Kelley and others 1st August, 2014, Old Bailey T20140188

some evidence that its use is declining amongst older teens as they diversify their social media use. Instagram, on the other hand, has seen a substantial rise in its user base, with Twitter apparently losing younger users and Tumblr continuing to attract a significant few (Ofcom 2014). Use of Ask.fm, which has recently reinvented itself after concerns about abnegation of safety responsibilities under previous ownership, is not currently measured by Ofcom despite its rising popularity. Of these social networks, Facebook and Instagram have community standards which forbid the posting of pornographic content or even nudity (with possible exceptions for pictures of art, breastfeeding etc.). Neither Tumblr nor Twitter take such a position, although both do require some restrictions on adult sexual content, such as not allowing pornographic images to be used in profile or background pictures (Twitter) or requiring all such content to be tagged as #NSFW (not suitable for work), in order to ensure it can be filtered by those who wish not to receive explicit content. Ironically, whilst such tagging is designed to make it less likely that children will stumble across explicit sexual content inadvertently, it also makes it much easier to find for any individuals deliberately seeking it. This demonstrates rather neatly the necessity of determining which will be the policy priority.

Whatever the community standards, the question of enforcement is a real challenge. The sheer quantity of photos and videos being posted on platforms such as Facebook or Twitter render real time moderation impossible, and these platforms rely on users reporting content that offends community standards, effectively crowd-sourcing the moderation process. This will obviously prove more effective for content that appears unexpectedly in a friend or group's newsfeed than for content deliberately and knowingly circulated amongst a closed group with the explicit intention of sharing adult content.

In the Net Children Go Mobile study, social network sites were the most common source for 9-16 year old children to see sexual images with 7% stating that they had experienced this. To keep this in proportion, however, it is worth noting that the next most common source was television and films, at 6%. Given the absence of detailed information about where the images were seen their origin there is a real need for more qualitative research to understand how such content is encountered online.

Peer-to-peer file-sharing sites

Although messaging apps such as Snapchat or WhatsApp are sometimes referred to as peer-to-peer technologies, the more technical use of this term describes the operation of file-sharing BitTorrent platforms such as KickassTorrents or those accessed by the infamous Pirate Bay portal. These platforms are used to trade films, music and software online without payment to the original copyright owners, and work by enabling users within a particular network of computers (a 'swarm') to download small bits of files from many different sources in return for allowing their own files to be downloaded by others in the swarm. The name P2P comes from the use of a protocol (set of coding instructions) that enables computers to communicate within one another directly without the need for a

central server. The absence of such a central point of control is precisely what makes such networks so hard to regulate, despite the best efforts of major international copyright-owning associations.

To the best of our knowledge there is no research which explicitly considers the experiences of under-18s using P2P file-sharing sites, but it is likely that children using these sites will encounter pornographic content, either by downloading adult films or (more frequently) via exposure to adverts. The former is obviously more likely to be intentional, but it is worth noting that torrent sites, especially the smaller less scrupulous ones, are renowned for using large amounts of ads to generate revenue, and ads for pornographic films and services are very common.

Currently several major torrent sites are blocked by most UK ISPs following a successful High Court order raised by the British Phonographic Industry in November 2014. Determined file-sharers will find it easy to circumnavigate this by using either proxy servers or a Virtual Private Network (VPN) which effectively creates a private link between the user and the site they wish to access, without alerting ISPs to their activity. Ironically, this very action may have pushed regular P2P users towards the smaller torrent sites which have little incentive to be perceived to act responsibly, and are more likely to maximise revenue by serving more adult adverts.

Mobile and tablet apps

Just five years ago, if you wanted to access content or activities online, you usually had to go to a specific website to find what you wanted, often via a search engine. In the era of mobile apps, websites and search are distinctly outmoded, and many of our favourite online activities are now accessed directly via the apps themselves. Apps are software programmes designed specifically for use on Smartphones and other mobile devices, and are adapted to make the most of the device capabilities, such as the touch screen or accelerometer. According to industry figures, overall app usage grew by 76% in 2014⁷.

As might be expected in a free market, there are plenty of apps that offer particular types of sexual content or experience, even though in theory both Apple and Google app stores do not allow apps with pornographic content. Both Apple's App Store and Android's Google Play app store now rate apps for age appropriateness, the latter in line with Pan European Game Information (PEGI) ratings, but there are various other third-party app stores which Android supports in its 'open world' ecosystem which may not use such ratings. Even without downloading apps that promise explicit sexual content, plenty of the apps that children use most frequently can enable the deliberate or inadvertent viewing or exchange of sexual images, as discussed in the sections above. There is also some evidence that teens

⁷ <http://www.flurry.com/blog/flurry-insights/shopping-productivity-and-messaging-give-mobile-another-stunning-growth-year#.VP7u7GYbsy4> (Flurry is Yahoo's Mobile Analytics company).

are using online dating apps such as Tinder, even though these are not designed for their age group⁸

In theory, the risks of adult-only apps should be mitigated by the age verification policies of UK mobile operators, according to which mobile content is filtered by default, and users must prove they are over 18 if they wish to access any adult content. Unfortunately, this is challenging for mobile operators to ensure in the current environment where apps may not be reliably age-rated by their developers, and where different operating systems employ different age-rating systems. In addition, if apps and content are downloaded via wireless, this will also be beyond the control of the mobile operators. It is also worth noting that the age verification required may either involve entering a simple birth date, or just rely on the checking of credit card details associated with an app store account. If the latter is linked to a parent's credit card then this won't prevent access to adult-rated apps. As an important trend in technology use, this seems to be a regulatory gap ripe for further discussions with industry stakeholders such as Google and Apple who ultimately control the rules that apply in their app stores, although it should be clearly noted that we are not aware of any research which measures minors' exposure to sexual content via apps.

Games

For teenage boys especially, games are one of the most important uses of their digital devices, whether played alone or against the computer, or online with known or unknown others (Ofcom 2014). Games are played on a games console such as the Xbox, on a PC or laptop or via apps on a variety of mobile devices. Such apps offer both specifically designed games for mobile devices as well as modified versions of some of the top console games. Although there is an extensive literature addressing the media effects of intensive gaming behaviours in adolescents, the surveys used for this review do not suggest that games are a frequent source of viewed sexual images for under-18s. This may be because very few of the best-selling console games and apps feature much in the way of sexual content or imagery, with only the Grand Theft Auto range having a reputation for the inclusion of such images. Similarly, whilst immersive games such as SecondLife or World of Warcraft are renowned for enabling sexual interactions as part of the play experience, we do not have any empirical evidence of this being experienced by UK children.

There is also a regulatory system in place for games in the UK, albeit one which is somewhat patchy given the different platforms on which games can now be played. The sale of boxed console or PC games is restricted according to Pan European Games Information (PEGI) age ratings, now backed up by law such that it is illegal for a vendor sell a game to a customer younger than the age rating given on the box. Games designed for those under 12 should not normally contain nudity, and if they do so, it must not be in a sexual context. Games

⁸ www.independent.co.uk/voices/comment/tinder-isnt-for-teens-so-why-are-so-many-using-the-app-9152087.html

rated 12+ can contain “nudity of a slightly more graphic nature” and those rated 16+ may display sexual activity that “reaches a stage that looks the same as would be expected in real life”⁹. Games distributed as apps on mobile devices are regulated according to the standards set down by the various operating system providers, with Windows following PEGI standards whilst Android and iOS currently apply their own ratings. It is not currently illegal for vendors to sell age-rated apps to users below the age given in its rating, nor do such restrictions apply to games downloaded via Xbox Marketplace or say PlayStation Store, although such virtual stores have very recently agreed to display PEGI ratings¹⁰. However, given that many of the most talked-about games, such as Grand Theft Auto or Call of Duty are rated 18, it is unsurprising that some studies suggest large numbers of minors are playing games with content considered unsuitable for their age group (e.g. Lenhart et al 2008, Rideout et al 2010). There is clearly scope here for more parental education on the content of games and the rationale for their ratings.

Physical exchange of content

We are not aware of any research evidence that under-18s are viewing pornographic images as the result of exchange of either physical devices, hard drives or memory sticks, but it is certainly a possibility, and one which no amount of Internet filtering would be able to prevent. Given the social significance of sharing pornographic images between friends or partners, however, there is research evidence to suggest that under-18s do show each other sexual images on their mobile phones (Horvath et al 2013).

Dark web

The media and political coverage of the ‘dark web’ characterise it as space where only those seeking to avoid official oversight will act. Defined as the large portions of the Internet which are not searchable by search engines, the dark web is renowned for services such as Tor, a US-government supported browser which allows anonymous browsing. Although anonymous Internet use might arguably seem appealing to many ordinary citizens keen to avoid governmental surveillance in the wake of Edward Snowden, such services are largely portrayed as facilitating extensive criminal activity. This is currently almost impossible to test, given the significant challenges of measuring data on the darknet.

There is at present no reliable evidence of under-18s using the dark web to gain access to pornographic materials. This does not mean that it does not happen, and indeed, given likely contrarian responses to perceived government censorship or surveillance there will almost certainly be a number of under-18s experimenting with Tor or similar services. It is, however, worth noting that there are many easier channels for less tech-savvy teenagers to

⁹ <http://www.pegi.info/en/index/id/33/>

¹⁰ <https://www.globalratings.com/news/pegi-ratings-expand-to-mobile-via-new-global-rating-system150317.pdf>

access such content and it is unlikely that porn would be the main draw in attracting minors to such sites. Ultimately, such spaces are very difficult to observe or research, let alone regulate, and a recent report from the Parliamentary Office of Science and Technology concluded that efforts to ban online anonymity systems such as Tor would be both publicly unacceptable and technically infeasible (POST 2015).

Harms associated with viewing pornographic images

There is a vast array of academic research devoted to the effects of exposure to sexualised imagery on children and young people, assessing links with phenomena such as sexualised behaviour, risk-taking behaviours and even attitudes towards women or within relationships. But this literature presents a complex and multi-faceted account from which it is not possible to draw simple conclusions. As Horvath and colleagues note in their review of research evidence (2013),

‘The available research investigating the links between children and young people’s descriptions of relationships and their access to sexualised or violent imagery is inconclusive and contradictory, and there is little of which we can be confident.’ (p. 47)

There are however, some points of which these authors feel we can be confident: that youth culture does seem to have been affected by sexual imagery; that children and young people are concerned about online pornography and that viewing such images can have effects on children. In this context, it is worth noting Coy’s points, drawing on the work of Miller-Young (2008) and Durham (2012), about the crossover in actors, characters, and practices featured in both music videos and pornography (2014), demonstrating strong links between the two types of media. US-based studies have also shown that men are more likely to agree with sexist statements after viewing sexualised music videos, and in her review of these, Coy cites one study which found that white participants rated black women more negatively where they had watched sexualised rap videos than if they had watched music videos without sexual content or no music video at all. The ‘real life’ implications of this are difficult to ascertain (Coy 2014).

Additionally, there is meta-analytic evidence to indicate that viewing more pornography and viewing extreme pornography is associated with the sexual objectification of women and more aggressive attitudes (Hald et al., 2010). Some longitudinal findings link sexual aggression and use of violent pornography, for example, one study of 10-15 year olds in the US found that those who intentionally viewed violent X-rated materials were nearly six times more likely than others to report sexually aggressive behaviour (Ybarra et al. 2011). Which comes first in such associations, the attitude or the seeking out of harm, is not clear and this relates to our earlier point about the challenge of asserting causality. Research also suggests that individual differences moderate such associations, meaning that we shouldn’t

generalise about possible effects across whole populations (Malamuth et al 2012). This still does not resolve the issue of the direction of causality but it is not unreasonable to assume that such associations are dynamic and potentially self-reinforcing and does give scope to consider pornography use in other interventions regarding sexual offending prevention. If further information is sought as to the harms possibly associated with viewing of pornographic content, it can be found in an accessible form in the report prepared for the Children's Commissioner for England by Miranda Horvath and colleagues, entitled 'Basically, Porn is Everywhere'¹¹.

The methodological limitations and absence of common definitions of what counts as pornographic mean that we have avoided making extensive claims about harm. The policy position underpinning this project specification is that pornography causes harm to children and we understand that we are not expected to challenge this. However, we would like to emphasise that the relatively limited academic evidence of harm means that any policy interventions should proceed on the basis of a precautionary principle, namely seeking to avoid possible risks in the absence of certainty. This makes it doubly important that those interventions are truly effective in reducing risk, with little collateral damage.

3. What are the challenges and opportunities these access routes hold for policy-makers seeking to limit viewing of pornography using mobile and Internet technologies?

The previous sections summarise our rapid review of what we know about how many children view pornography online, what characteristics these children share, and how the material is accessed. From a policy perspective, perhaps the first key points to draw out are that:

- Academic research provides evidence that UK children are accessing explicit sexual content via the Internet or mobile technologies. Older children are more likely to have encountered pornography online in the past year than younger children.
- Children may encounter pornography inadvertently and unexpectedly whilst doing something unrelated online, they may seek it out deliberately or they may even feel pressured or coerced into viewing (or even creating) such material. Preventing viewing of pornography will likely require very different measures for those who

¹¹http://www.childrenscommissioner.gov.uk/force_download.php?fp=%2Fclient_assets%2Fcp%2Fpublication%2F667%2FBasically_porn_is_everywhere_Final.pdf

inadvertently find it, compared to those who deliberately seek it out, or are pressured into viewing.

- There are diverse routes by which children can access pornography online, many of which are beyond the reach of ISP-provided home-level filters. Children are also exposed to pornography offline. The most frequently cited sources are social networks, television and film, Internet adverts and magazines or books.
- Even if the focus of this expert review is online pornography, it must be set in a wider social context where sexualised content is widely available in music, videos, films and TV and policy opportunities and challenges must reflect this.

Policy Challenges and Opportunities: a framework for intervention

Given what we know, certain opportunities and challenges for policy-makers emerge. Whilst it is beyond the scope of this report to propose or review specific policy options, it is useful to highlight broad issues for consideration. One helpful way of thinking about these is to consider the different means by which children's access to online pornography might be countered. In the study of Internet governance, one of the most oft-cited regulatory frameworks is that proposed by Larry Lessig (Lessig 1999). He argues that human conduct can be regulated in four different ways: by laws, by markets, by social norms, or – in the era of cyberspace and digital government - by computer code. Whilst it is beyond the scope of this document to review the academic merits of Lessig's work, it does offer a simple framework according to which we can categorise the various policy opportunities and challenges relating to children's viewing of pornography online.

Opportunities and challenges of legal intervention

It should be noted that the expert panel convened for this project did not include any lawyers, so we are unable to offer any qualified legal insight as to areas where specific legislation might be updated or extended. On a general level, it would seem counter-productive to introduce new legislation which would criminalise children for viewing pornography, but it may be a more appropriate intervention to adopt with other stakeholders such as in ensuring more responsible industry practice, either where self-regulation is proving ineffective or where UK government lacks powers to persuade international industry players. The most obvious opportunities for legal intervention relate to three different sets of stakeholders already bound by various legislation and regulatory codes – content providers, intermediaries and schools.

Given that it is already illegal in the UK for offline content providers to distribute pornographic images to anyone under the age of 18¹², there would seem to be an obvious

¹² Off-line distribution of material that is rated R18 by the British Board of Film Classification (BBFC) is restricted in 'hard-copy' such as film and video by legislation, including the Video Recordings Act 1984, and must not be broadcast on television at any time.

opportunity here to consider the efficacy of existing legislation, and in particular whether implementation of this is still effective in an era where Internet content is produced or hosted in so many different international jurisdictions. Just as there has been a gathering international consensus in recent years about the importance of having clear, fast procedures for removing child abuse images, there is scope for a broader international discussion about measures which responsible providers of adult content can take to limit access by minors.

There is already a great deal of attention focused on the responsibilities of Internet intermediaries such as Internet Service Providers, mobile phone operators and search engines. Most of the interventions designed to prevent minors accessing harmful content undertaken in the UK have so far been self- or co-regulatory, without legal penalty to attached to any industry failure to comply with agreed best practice. This may well be satisfactory but there is an opportunity to consider whether currently self-regulatory practices might be better supported with legal duties to comply, such as introducing a requirement that any ISP wishing to offer connectivity to households rather than businesses should have to offer a free household-level filtering package, although it is vital that given the limitations of filtering, this is not regarded as the only tool for intervention. It would also be helpful to consider whether in the context of this particular policy issue, there are any other intermediaries who might be involved to help limit children's access to online pornography. ATVOD, for example, has previously suggested that statutory protection could enable the UK payments industry to prevent payments flowing from UK users to online adult sites which allow under-18s to access pornographic content.

The last area for possible legal intervention concerns schools. Specifically is there an opportunity here to consider whether statutory provision of personal sexual and health education (PSHE) across all secondary schools (irrespective of their funding status) would help address these issues? The provision of PSHE was recently reviewed by the Department for Education and a decision was taken that it would remain a non-statutory subject without standardised programmes of study. We believe, however, that careful attention should be paid to the findings of the House of Commons Education Committee who concluded that "PSHE requires improvement in 40% of schools. The situation appears to have worsened over time, and young people consistently report that the sex and relationships education (SRE) they receive is inadequate."¹³ If provision does become statutory in the future, there would be great value in designing a curriculum that has a core focus on relationships and how they affect sex, including discussion of different sexual and gender identities and clear advice about consent. There should also be discussion of access and exposure to pornography to equip young people to understand that pornography does not represent 'real world' relationships.

¹³ <http://www.publications.parliament.uk/pa/cm201415/cmselect/cmeduc/145/145.pdf>

The greatest challenge to deploying UK legislation as a tool to reduce exposure of UK children to pornography online is that some of the most prevalent sources of online sexual content seem to be either located outside UK jurisdiction (as in the case of most offending adverts or websites), or located within children's homes and schools (in the case of self-generated content distributed via social networks or messaging apps). It should be noted that any additional measures to enforce existing legislation around illegal access to extreme pornography would have notable benefits for children, helping to ensure they do not encounter the very worst content.

Harnessing the power of the market

Many of the industry stakeholders identified in the previous section already work with the UK and other governments to support safe, legal use of Internet products and services. But if we consider the range of routes to access pornography online as discussed above, there are some clear opportunities emerging for various industry actors to play even more of a role.

One area where interesting possibilities are emerging is online age verification. Discussion of such a possibility has been raised previously in child protection policy reviews but has always been dismissed as insufficiently effective (European Commission 2008; Internet Safety Technical Taskforce 2008). In the UK it is currently difficult to verify age of children under 18 due to the absence of publicly checkable databases containing official information about minors, although there are official private datasets which do hold such information, such as those used by JISC's UK Access Management Federation to enable children's secure access to age-appropriate teaching resources. It is, however, more straightforward to determine whether someone is aged 18 or over, as the experiences of the licensed online gambling industry have shown. Although it is clearly impossible to provide perfect verification, particularly if a child uses a parent's credit card or ID, at a minimum, UK companies providing pornographic content should be adopting the same stringent procedures albeit with a recognition that preservation of personal privacy will be essential if this is to be trusted by users. We are aware that technical age verification already receives some policy attention, being the subject of a Working Group both at the UKCCIS and the Digital Policy Alliance which is a welcome development.

A second area where there is scope for industry stakeholders and government to work together concerns around the rating and provision of apps for mobile digital devices. The sale of boxed console games is currently subject to strict regulation and requirement of proof of age according to the PEGI rating of the game (although not always well enforced), online apps and games are only bound by the self-regulatory codes of the app-stores or digital stores selling their these products. Whilst the recent expansion of PEGI ratings to several digital storefronts is to be welcomed, this still leaves many digital stores outside the scheme. Generally, it should not be possible for a 12 year old to download an app suitable only for those over 18. However, it would not be advisable to restrict general purpose apps

which have potential pornographic uses, as this would seem to be a disproportionate application of the precautionary principle.

Given the apparent prevalence of social networks as a source of pornographic images, it is tempting to think that the most popular SNS, Facebook, must be at fault here. However, as was pointed out above, children use a variety of social networks, some of which allow adult content, some of which do not. Without more detailed evidence of where such images are being accessed, and whether they are stumbled across accidentally or being deliberately created or uploaded by children themselves, there is no justification for requesting specific action. One possible starting point would be to discuss age verification requirements with platforms such as Twitter or Tumblr which do support the sharing of adult content.

The particular challenges in securing market intervention relate to the vast array of actors involved in delivering these technologies. Although it is straightforward to start a dialogue with the biggest tech companies who may ultimately want to be seen as good corporate citizens, it is very difficult to coordinate action where there is a multiplicity of players, as in the online advertising space, or where actors have no interest in complying with social or ethical norms, as is the case with the smaller players in the P2P field. Given that one of the most common places that children claim to have seen pornographic material online is through adverts, this is clearly an area which merits further consideration, albeit complicated by the fact that many of the sites visited will be located physically beyond the UK jurisdiction, and that the ecology of industry actors involved in serving adverts online is highly complex.

Given that one of the most common places that children claim to have seen pornographic material online is through adverts, this is clearly an area which merits further consideration. The UK Advertising Codes now cover online behavioural advertising as well as online banner and display ads and marketing on social media like Facebook or Twitter. As a starting point, the ASA should ensure that we can have confidence that UK Internet companies are not serving adult-only advertisements to household devices used by children. Further consideration could also be given to the potential safety applications of ad-blockers, although this would undoubtedly be unpopular with the many 'free-to-use' Internet services which rely on advertising revenue to survive. Either way, it would be helpful to have more input from this sector that has so far been largely excluded from child safety discussions, and there could be an important role for UKCCIS here in bringing together the various stakeholders.

Developing social norms

Although it has been beyond the scope of this report to consider all the broader societal factors which might shape children's viewing pornography online, any programme of action will need to consider these if there is to be any hope of reducing exposure. There is often a tendency to think that because Internet use exposes or facilitates problematic behaviours,

these are technical problems, with a technical fix. The reality is of course that these are social problems with complex underlying roots and causes. To this extent, there is a real opportunity here to channel political and public concern with the proliferation of online pornography into an open-minded society-wide debate about the norms and values inherent in pornography, and the harms of encountering it at too early an age. For example, whilst curiosity about sexual intercourse is an entirely normal part of a child's maturation process, we might want to challenge societal norms according to which viewing pornography is increasingly regarded as a status-conferring rite of passage. Such debate might also help raise awareness of the gulf between the fictional sexual relationships depicted in pornography and how relationships play out in real life.

In this context, it is also vital to recognise that pornography is just one aspect of UK society where children are exposed to highly sexualised ideas and images of sexual inequality, sexual violence, hetero-normative discrimination, the trivialisation of relationships and so on. Pornography is not an isolated social phenomenon, and any interventions must similarly be multi-dimensional and would best be undertaken through a variety of different channels, perhaps involving peer-led campaigns that can encourage debate amongst teenagers and young people as well as public awareness campaigns, media discussions and in-school education programmes. The aim would also be to raise awareness amongst parents and carers of these intersecting issues and to enable them to more easily discuss such matters with the children they care for. Given the success of peer-led campaigns, such as those used to combat bullying, it is important to involve children and young people's voices in both public and school-based discussion of issues such as combating sexual coercion and promoting consent, sexual etiquette, privacy and sexting or the role of parents and schools in better supporting students' developing sexual identities.

There is also an opportunity here to reconsider how we raise and teach our children. The US in particular has invested in programmes to build resilience, such that children are better able to adapt to adversity and withstand harms, and it is worth asking whether or not this is also desirable in the UK. This may be particularly important in developing interventions to support more vulnerable groups such as looked-after children, children with special educational needs or children with a history of abuse. There is evidence to suggest that children who are vulnerable on other measures may be at greater risk from online experiences (Mitchell et al 2005) whilst at-risk or vulnerable children will also be the hardest to reach via educational and awareness-raising initiatives.

Part of the resilience-building process may involve ensuring that all children develop the critical faculties to see beyond the surface of the various sexualised media they consume. Media literacy training has become an important part of the curriculum and whilst the specific harms of pornography as distinct from other sexualised media are unclear, it would be helpful if media literacy training for teenagers could incorporate critical analysis of

imagery around sexuality, gender and race, with a focus on the ‘fiction’ of pornography as one further aspect.

There are undoubtedly great challenges for any government seeking to make headway in this space, most notably the complexity of knowing how to start tackling widespread norms of sexual discrimination which make it acceptable to treat women as sex objects, to expect girls to send their partners naked or explicit ‘selfies’ or for boys to see porn as a means of enhancing social status amongst their friends. This is a multi-dimensional societal problem, and governments alone cannot expect to resolve it, but this doesn’t mean that multi-faceted, collaborative policy interventions couldn’t make some headway.

Code as Law: the contribution of technical tools

According to Larry Lessig, computer code is a contemporary equivalent of law. To the extent that code limits the possibilities for interaction and experience within a particular application or platform, it is clearly a valuable lever to apply in the plan to enhance children’s safety online, albeit one which is not within government control. This does not mean that there is a technical fix to every societal problem, and it must be remembered that many technical interventions will, like other interventions, have unintended effects, for good or for ill. There may however be scope for the UK government to encourage industry players to code new forms of safety protection into their products, with most obvious opportunities in the areas such as filtering, ad-blocking and behavioural profiling.

Over the past two years, government has worked successfully with the major UK ISPs, encouraging them to provide household-level (as opposed to device-level) filtering, as well as family friendly WiFi in public areas. This web-based blocking employs a variety of techniques to block web content, such as by maintaining block-lists or acting on ‘banned’ keywords. This has been reasonably well-received by parents, although uptake has not been fast and concerns rightly remain about under and over-blocking, particularly in relation to sexual health charities or educational materials. The main work to be done now consists of persuading those ISPs that don’t offer this service to do so, and supporting efforts to increase uptake by parents. In the latter case, there is still scope for further innovation: a more granular approach offering parents the means to access adult materials whilst keeping children of different ages safe may help to increase the numbers who agree to household Internet filtering.

We noted above that online advertisements are a commonly reported source of sexual content for children. There is a real opportunity here to enhance protection by encouraging take-up of ad-blocking services. Such services are already included in some parental control packages; for parents and carers without these, it would mean downloading and installing software from the Internet, which may be technically challenging for some. It is worth noting however, that wider uptake might also have great unintended consequences for content and service providers that are free at the point of use, who therefore rely on

advertising revenues. Impact would be lessened if such ad-blocking tools could provide an ‘acceptable ads’ list¹⁴ that purely blocks adverts with explicit sexual content. Apple’s announcement that its iOS 9 operating system would allow ad-blocking extensions to operate in Safari has stimulated a wider debate about the value of the advert-funded content publishing model and it seems likely that there will be further innovation on both sides over the coming months.

There is one further means by which advertising with sexual content might eventually be served more discriminately. Many digital companies undertake extensive behavioural profiling of their users for the purposes of providing more narrowly targeted services, and also to provide more valuable data to ad-servers. Although such processes do not currently count as an acceptable means of accurately verifying age, it would be interesting to explore how far such profiling could help to detect whether a device or connection might be shared by a child, and consequently flagging these profiles as requiring family-friendly advertising.

Just as technological innovation does provide new opportunities for tackling children’s access to sexual content online, it’s also important to remember that there is no such thing as a magic bullet here. Such technical fixes have their own limitations and challenges. Filtering technologies are a good example. Even the most sophisticated filters are subject to inherent limits, and will never come close to the ‘perfect’ blocking that is sometimes imagined. It is particularly challenging to filter new content in real time. Search engines, for example, do filter in real time when operating in SafeSearch mode, but can only do so because they have previously categorised a vast proportion of pages. User-generated content will not usually appear in these databases, and given that pornographic content is so hard to detect algorithmically, it is unsurprising that we have not seen many developments in this field. This has particular implications for those who would like to see real-time filtering of say, social networks or instant messaging services for pornographic content as it would be extremely challenging to provide a filtering service with acceptable levels of accuracy.

Encrypted services also present challenges for parental controls. Although such standards were traditionally used mainly by banks and payment institutions, more and more services are moving to encryption by default, in part as a response to public concerns about such government surveillance. Encrypted web traffic provides a particular challenge for ISP blocking, as it becomes impossible to tell which pages within a given website are being accessed, and whether or not these pages contain explicit sexual content. This is likely to result either in over-blocking (where the whole website is blocked even if the vast majority of pages are clean) or under-blocking where the website is not blocked, and explicit content within it is accessed. Although it might then seem appealing to call for a ban on the use of

¹⁴ The AdBlock tool already offers such a service, but not with a focus on adult content. It would therefore seem to be a plausible model which the adblocking industry is already developing for other types of adverts.

encryption in non-sensitive services, even the Parliamentary Office for Science and Technology have noted that this would be a disproportionate and unfeasible response (POST 2014).

Perhaps more surprisingly, the increasing use of non-web based applications such as mobile apps on Smartphones and tablets also provides a particular challenge for parental control systems. Although the UK mobile operators have co-operated since 2005 to filter their Internet access services unless robust proof of adult age can be provided, app-based services raise new difficulties given that they access content in non-standardised ways and can be initially downloaded over wireless networks. The efficacy of existing filters is also dependent on the accuracy of app age ratings which currently vary across platforms and app stores, and are reliant on responsible self-regulation by the companies involved. The BBFC provides an independent framework to help mobile operators decide which content is suitable for minors, but it is not clear how much oversight of all apps in the various app-stores is even possible: this is clearly an area for further investigation.

4. What are the considerations that future governments should take into account in developing effective policy solutions to limit children’s viewing of pornography using mobile and Internet technologies?

All members of the expert panel agreed that they could think of no policy interventions that would offer a large-scale reduction in the viewing of pornographic images online. As one of the expert submissions put it,

“...there is not going to be a complete technological solution that will provide a safety shield for young people, whether from extreme sexual material, or from extreme violence, hate or radicalisation. An effective policy solution needs to consider not just ‘how to limit children’s access’ but should also deal with the repercussions of their inevitable exposure to and uses of such sites.”

Above, we have outlined some of the main policy opportunities and challenges which emerge from the academic research as we see it. These are deliberately focused quite narrowly on the questions of strategies for limiting access to pornography online. It will be vital that in considering each of these, the question of policy priorities is brought to the fore. In particular, the efficacy, proportionality and cost of each of these will depend heavily on whether the intention is to limit only accidental viewing of pornography or also deliberate. For example, the introduction of household-level ISP and public WiFi filtering may be a useful step towards preventing children from encountering pornography online when they

don't mean to, but is unlikely to severely hamper the efforts of teenagers who are determined to view such content.

There are, however, several other policy areas that overlap with some of the issues discussed above, and which therefore also merit further consideration.

Information Rights

The duties we hold to our children extend beyond merely the requirement to protect, and it is conceivable that with the best of intentions these other responsibilities get forgotten in the race to eradicate some of the most alarming risks. The United Nations Convention on the Rights of the Child recognizes that those under the age of 18 often need special protection. Whilst many of the rights articulated there have relevance for Internet policy, there are two which have particular import:

‘States Parties undertake to ensure the child such protection and care as is necessary for his or her well-being, taking into account the rights and duties of his or her parents, legal guardians, or other individuals legally responsible for him or her, and to this end, shall take all appropriate legislative and administrative measures.’
(Article 3)

‘1. The child shall have the right to freedom of expression; this right shall include freedom to seek, receive and impart information and ideas of all kinds, regardless of frontiers, either orally, in print, in the form of art, or any other media of the child’s choice.

2. The exercise of this right may be subject to certain restrictions, but these shall only be such as are provided by law and are necessary:

(a) For respect of the rights or reputations of others; or

(b) For the protection of national security or of public order, or of public health or morals.’ (Article 13)¹⁵

In practice, the first of these means that states have a duty of care and protection for minors; in the context of the Internet this requires governments to intervene to limit the most significant forms of harm that might result from Internet use. But the addition of Article 13 imposes a delicate balancing act: such interventions must be so designed that they do not unduly restrict fundamental freedom of expression and information – not just because this matters for adults, but because these rights are attributed to children too. Of greatest importance is the duty to ensure that our zealous efforts to filter out material such as pornography do not also filter out valuable learning resources such as sexual health sites,

¹⁵

Available at: <http://www2.ohchr.org/english/law/crc.htm> Accessed August 20 2012.

or sites and forums which provide space to talk about difficult issues of sexual development, identity and experiences. Ultimately, we must ensure that children have the right to express themselves sexually, to explore and communicate without ever-present oversight.

Other Internet-related risks and harms

Given our remit, we have necessarily focused on the risks posed by children's access to online pornography. There are, however, many other types of online content and activity that may carry risks for particular groups of children, and it would be roundly beneficial if some of these other risks could be kept in mind as decisions about further policy interventions are taken. So, for example, pornographic pop-up and banner adverts may pose a rather unique challenge not matched in the case of other types of harmful content (such as suicide forums). But in other cases there will be overlapping concerns: instant messaging apps, for example, may be just as easily used to swap 'thinspiration' tips as nude 'selfies'. Thus, whilst there is merit in focusing deeply on a single issue like pornography, the challenge is to hold at the same time, a rich understanding of the surrounding and overlapping concerns.

Unintended Consequences

Jonathan Zittrain characterises the Internet as inherently 'generative' (Zittrain 2008). By this, he means that it enables its own evolution: the absence of any central command, the malleability and resilience of the architecture that underpins it, and the extraordinary array of coding languages which shape it, all unite to enable ordinary citizens to write and rewrite the future of the Internet. These same features also make it difficult for states to control the actions of their subjects online, with technical 'work-arounds' available for almost any interventions that governments apply. Filtering, for example, can be easily bypassed simply by employing a VPN service, or using a proxy server. To this extent, it is important to consider what the actions of frustrated teenagers might be if their desired access to pornographic web content is hindered by stronger filtering. If ever more rigorous filtering of home content makes teenagers and young people feel overly-surveilled, then there is a risk that they will just turn to other access routes which are far harder for parents or carers to detect. Similarly, as noted in earlier sections, blocking or banning certain services such as illegal peer-to-peer sites may just redirect users to even riskier sites. This is not an argument against acting, but it is a useful reminder that many technological interventions often only act as temporary roadblocks and as such, they should be used in conjunction with other measures which help children interpret and deal with materials they may encounter accidentally. In other words, what are the unintended effects of the policy interventions discussed here?

5 Conclusion

In the preceding pages we have attempted to set out a rapid overview of what we know about *which* children access pornography online and *how*. We have then picked up on these routes to access to suggest an array of policy opportunities and challenges that might be considered in the design of future policy interventions. Finally, we have indicated other wider considerations which should be addressed if interventions are not to prove counter-productive, or even damaging when we consider other aspects of the well-being of children and teenagers. It is impossible to do justice to such an incredibly complex and important subject in the timeframe allowed for this expert panel, but we would all be willing to discuss the issues raised here in greater depth if required.

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