Child Pornography Possessors: Trends in Offender and Case Characteristics

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Abstract

This article describes trends in child pornography (CP) possession cases that ended in arrest in 2000 and in 2006, using data from the National Juvenile Online Victimization Study, a two-wave longitudinal survey of a national sample of more than 2,500 U.S. law enforcement agencies. In 2006, there were an estimated 3,672 arrests for CP possession, compared with 1,713 arrests in 2000. Many characteristics of the offenders and the offense remained stable. In both 2006 and 2000, most offenders were White, non-Hispanic males and socioeconomically diverse. Few were known to have committed previous sex crimes. Most had CP that depicted preteen children and serious sexual abuse. In 2006, however, a higher proportion of offenders were aged 18 to 25 years, used peer-to-peer (p2p) networks, had images of children younger than 3 years, and had CP videos. P2p users had more extreme images (e.g., younger victims, sexual violence) and larger numbers of images than those who did not use p2p networks. Findings reflect heightened efforts in the criminal justice system to combat CP crimes. More cases originated with investigations of CP possession and involved proactive investigations aimed at detecting CP. The great majority of cases were successfully prosecuted, with more offenders sentenced to incarceration and serving longer sentences than in 2000. As in 2000, one in six cases that began with investigations of CP possession detected offenders who had molested children.

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Introduction

Child pornography (CP) possession is an unusual sex crime; it is a form of child sexual exploitation that requires no direct interaction with a victim. The crime is having images that are contraband because they show actual children (often unidentified) being sexually abused and exploited.

The Internet and related technologies have made CP easily accessible and increasingly pervasive (Beech, Elliott, Birgden, & Findlater, 2008; Jenkins, 2009; Quayle, 2009; Taylor & Quayle, 2006; Wortley, 2009). Law enforcement resources have been absorbed by rising numbers of investigations, arrests, and prosecutions for CP possession (Federal Bureau of Investigation, 2007; U.S. Department of Justice, 2007, 2008). The growing capacity of computers to transmit and store images and the availability of inexpensive digital photography may be expanding the reach of CP into new populations. A primary concern is peer-to-peer (p2p) file sharing networks such as Gnutella and BitTorrent, which allow users to bypass centralized servers and download files from networks of individual computers (Jenkins, 2009; Koontz, 2005; Steel, 2009). Programs used by law enforcement to detect CP distribution via such networks suggest that tens of thousands of individuals in the United States use p2p networks to download CP (M. Liberatore, personal communication, July 30, 2009). In addition, although a sexual motive is not required for the crime of CP possession, having CP certainly suggests such a motive, and there is evidence that many CP offenders are sexually interested in children (Quayle & Taylor, 2003; Seto, Cantor, & Blanchard, 2006). Rising numbers of CP offenses have generated a number of concerns.

One concern is that the accessibility of online CP has caused increases in child sexual abuse. Some research suggests that CP may trigger sexual abuse by activating and validating sexual urges in CP viewers that were previously suppressed or controlled (Beech et al., 2008; Quayle & Taylor, 2003; Wilson & Jones, 2008). There is no evidence of increasing abuse in the United States, however. In fact, rates of child sexual abuse have declined substantially since the mid-1990s, a time period that corresponds to the spread of CP online. Statistics from U.S. child protective service agencies show that from 1992 to 2007, child sexual abuse declined 53% (Jones & Finkelhor, 2009), including interfamilial abuse (Finkelhor & Jones, 2006). Evidence of this decline also comes from victim self-report surveys and U.S. criminal justice system data (Finkelhor & Jones, 2008; Finkelhor, Turner, Ormrod, & Hamby, 2010), as well as the child protective services data collection system. The fact that this trend is revealed in multiple sources tends to undermine arguments that it is because of reduced reporting or changes in investigatory or statistical procedures. Nonetheless, we cannot conclude for certain that the online circulation of CP is having no impact, despite these indicators. Even if child sexual abuse has not increased, more abusers may be recording and circulating images of the abuse they perpetrate, there could be increases or shifts in victim populations that might not be reflected in large aggregated data collection systems, and increases in abuse associated with CP consumption could be seen in the future. However, it is important to recognize that, to date, there has not been a spike in the rate of child sexual abuse that corresponds with the apparent expansion of online CP.

A second concern is whether the online trade in CP is fueling escalating demands by CP consumers for more, newer, and increasingly extreme images. For example, some commentators have suggested that the victims depicted in CP have become younger and the images more brutal (Beech et al., 2008; Frieden, 2006; Oosterbaan, 2009). Most offenders arrested in 2000 had images of children younger than 12 years and explicit images that showed sexual penetration (Wolak, Finkelhor, & Mitchell, 2005). About one in five arrested offenders had images of children aged 3 years or younger (19%) or CP that portrayed brutal sexual violence (21%). Clearly, most offenders arrested for CP possession had graphic images that pictured child abuse and some had more extreme CP. However, empirical evidence about whether CP is becoming more extreme is lacking because there is little research that systematically collects data about known CP images circulating online (e.g., ages, genders, and numbers of victims; content of images; dates images were introduced to the Internet). Assertions about increases, decreases, or stability in the characteristics of victims and abuse shown in images are hypotheses that remain untested.

Finally, a fundamental concern is the extent of the association between offenders who access online CP and those who sexually abuse children. The connection between viewing CP and pedophilia is documented among offender populations (Seto et al., 2006). That law enforcement investigations of CP possessors lead to arrests of child sexual abusers is also documented (Wolak et al., 2005). However, little is known about which CP possessors are most likely to be abusers. Research on this question is evolving, but several studies of clinical and criminal justice system samples of CP possessors suggest that CP offenders are diverse and reflect a broad spectrum of risk, from low to high (Bourke & Hernandez, 2009; Middleton, Beech, & Mandeville-Norden, 2005; Quayle, 2009; Quayle & Taylor, 2001; Seto & Eke, 2005; Taylor & Quayle, 2006; Webb, Craissati, & Keen, 2007; Wilson & Jones, 2008).

Unfortunately, reliable information on the scope and nature of CP possession remains scarce. Established criminal data collection systems do not gather detailed data on such crimes that could help inform public policy and education. To remedy this information vacuum, we have conducted two waves of a longitudinal study, the National Juvenile Online Victimization (NJOV) Study. This article reports results from the NJOV Study that are relevant to concerns about crimes involving CP possession and that also illustrate the limitations of current research on this topic. Findings describe comparisons between CP possession cases ending in arrests between mid-2000 and mid-2001 and during 2006 in terms of numbers of arrests, characteristics of offenders, nature of the CP possessed, use of p2p file sharing networks, how and where CP cases arose in the criminal justice system, and case outcomes. We also summarize key empirical issues regarding CP cases and discuss research that is needed.

Method

The NJOV Study, a longitudinal study of a national sample of U.S. law enforcement agencies, is the first research project to systematically collect data about the number and characteristics of offenders arrested for Internet-related sex crimes against minors

and the dynamics of the crimes they commit. So far, two waves of data have been collected. Wave 1 was conducted between October 2001 and July 2002. We surveyed a national sample of 2,574 state, county, and local law enforcement agencies by mail asking if they had made arrests in Internet-related CP or sexual exploitation cases between July 1, 2000, and June 30, 2001. Then detailed telephone interviews were conducted with investigators about specific cases (unweighted $n = 612$). To increase the reliability of responses, we asked investigators to have and refer to case files during interviews. Using the same procedures, we collected data for Wave 2 between June 2007 and August 2008, from a national sample of 2,598 agencies about cases ending in arrest in calendar year 2006 (unweighted $n = 1,051$). The data in this article come from a subsample of 1,034 cases involving arrests for CP possession (Wave 1, unweighted $n = 429$; Wave 2, unweighted $n = 605$).

Sample

The NJOV Study agency sample was designed to yield a nationally representative sample of Internet-related child sexual exploitation cases that ended in arrest. We used a stratified sample of agencies because such cases do not occur with equal probability among the more than 15,000 U.S. law enforcement agencies. The sample was divided into three frames. The first frame consisted of agencies mandated to investigate Internet-related child sexual exploitation crimes, including federal agencies and federally funded Internet Crimes Against Children Task Forces (Wave 1, 1st frame, $n = 75$; Wave 2, 1st frame, $n = 101$). We did not sample this frame but surveyed all agencies. The second frame consisted of law enforcement agencies with staff that had received training in investigating Internet-related child sexual exploitation cases prior to Wave 1. These were identified through lists provided by the training agencies. About half of second frame agencies were randomly selected to participate in the study (Wave 1, 2nd frame, $n = 833$; Wave 2, 2nd frame, $n = 832$). The third frame consisted of all other local, county, and state law enforcement agencies in the United States, approximately 13,586. About 12% of 3rd frame agencies were randomly selected for the sample (Wave 1, 3rd frame, $n = 1,666$; Wave 2, 3rd frame, $n = 1,665$). (Differences in the numbers of agencies in specific frames between Waves 1 and 2 reflect changes in status among agencies, for example, as new Internet Crimes Against Children Task Forces were funded.)

We designed a sampling procedure for case-level telephone interviews based on the number of cases reported by an agency, so that we would not unduly burden respondents in agencies with many cases. If an agency reported between one and three cases, we conducted follow-up interviews for every case. For agencies that reported more than three cases, we conducted interviews for all cases that involved identified victims and sampled other cases. (By "identified victims" we mean those who were identified and contacted by law enforcement in the course of investigations. We distinguish such victims from many victims pictured in CP whose identities are unknown.) For agencies with between 4 and 15 cases, approximately half of the cases that did not have identified victims were randomly selected for telephone interviews. In agencies
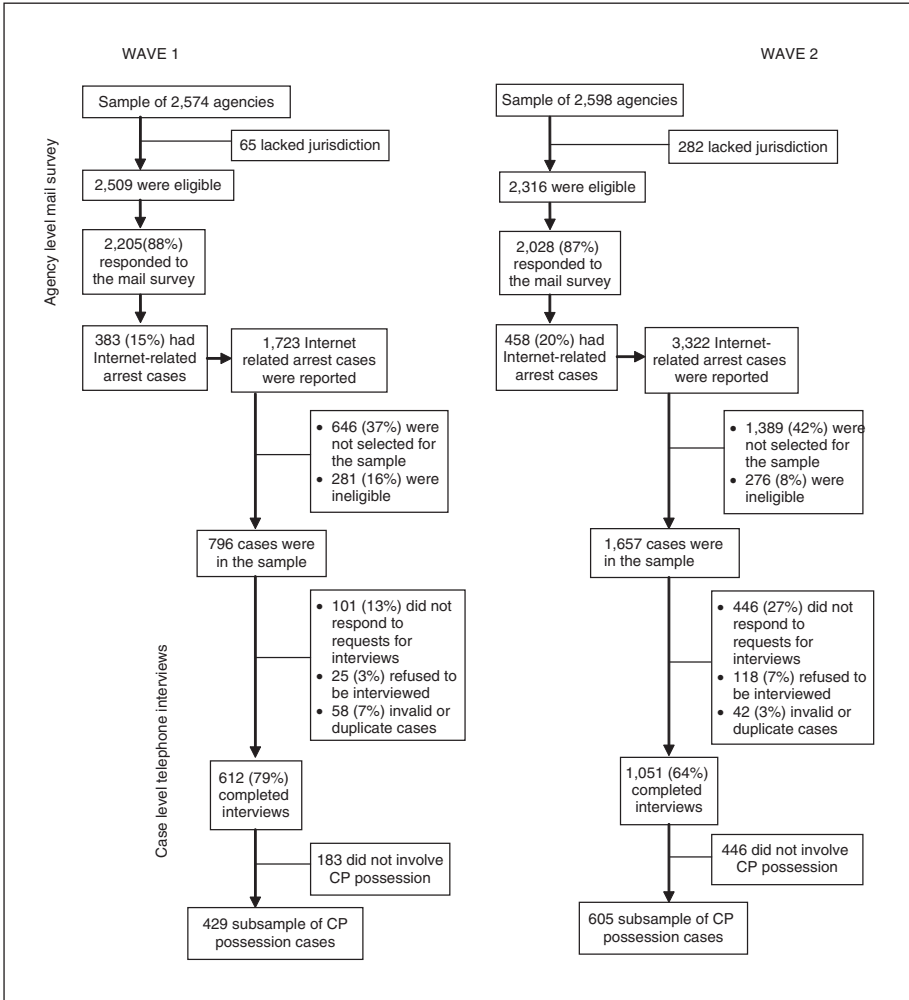
Figure 1. Disposition of agency- and case-level samples

that reported more than 15 cases, approximately one quarter of the cases with no iden-
tified victims were randomly selected. In some agencies, we could not find out which
cases had identified victims, so we sampled from all cases, using the procedures
described above.

Figure 1 provides details about the dispositions of the Wave 1 and Wave 2 agency-
level mail survey and case-level telephone interview samples.

To be eligible, cases had to (a) have victims younger than 18 (including unidentified
victims depicted in CP); (b) involve arrests between July 1, 2000, and June 30, 2001
(Wave 1) and in 2006 (Wave 2); and (c) be Internet related. CP possession cases were

Internet related if they involved a proactive investigation of online activity; CP was received or distributed online, or arrangements for such were made online; or CP was found on a computer or on removable media. In Wave 2, "Internet" was defined to include cell phones and related electronic devices.

Definitions and Measures

We identified CP possession cases by asking respondents, "Did this offender possess child pornography?" We did not define CP further because definitions vary somewhat among jurisdictions, and we wanted to capture the full range of cases identified by law enforcement as involving CP. "Child sexual abuse" includes sex crimes that directly victimized known children or undercover investigators posing online as minors, including contact and noncontact crimes (e.g., online luring). Other variables were based on questions developed for the NJOV Study through interviews, pretesting, and piloting with law enforcement before Wave 1 data collection began. Questions covered offender characteristics, characteristics of CP found by police, how cases came to the attention of law enforcement, other sexual offenses committed, and case outcomes. Some questions about technological developments after 2000 were added to Wave 2.

Weighting and Statistical Analysis

Weights were constructed to reduce bias resulting from variations in selection probabilities, response propensity, and nonresponse (Kish, 1992). The weights corrected for the probability that an agency or a case would be selected for the sample, given that the sample was stratified (some agencies had a higher probability of selection) and based on the sampling procedure we used for cases (number of cases reported by an agency and whether the case involved an identified victim). Cases that had lower probabilities of selection were given greater weight, thus the weighted distribution of cases reflects the population of cases from which the sample was selected. Weights also adjusted for unit nonresponse (Kalton, 1983). The cell weighting method (Särndal, Swensson, & Wretman, 1992) of nonresponse adjustment was used, where the overall sample (i.e., responding and nonresponding) was partitioned into a number of nonresponse adjustment cells with similar agency or case characteristics. The ratio of the sum of weights for all cases to the sum of weights for respondents was then used as a nonresponse adjustment factor. The cell weighting method of nonresponse adjustment represents an improvement over the uniform response propensity model, but it is acknowledged that some nonresponse bias may remain.

Four weights were constructed to reflect the complex sample design. First, each case was given a weight to account for its probability of selection to both the mail survey and telephone interview samples. The sampling weights were adjusted for agency nonresponse, case-level nonresponse, duplication of cases among agencies, and arrests by one federal agency that did not participate in case-level interviews. Second, primary

sampling weight units were created to account for clustering of cases within each of the three sampling frames. Third, stratification weights were computed to reflect the differing sampling strategies for each frame. Finally, finite population correction factors accounted for the sample being conducted without replacing ineligible cases. More detailed information is available in the NJOV Study Methodology report, posted online at http://www.unh.edu/ccrc/pdf/N-JOV2_methodology_report.pdf.

We used weighted data to estimate numbers of arrests for crimes involving CP possession. We used chi-square cross-tabulations to compare differences between arrest cases in 2000 versus those in 2006, in terms of CP offender demographic characteristics, nature of CP possessed, technology use, dual offending, and case outcomes. Chi-square comparisons were performed on weighted data. Because applying standard chi-square calculations to weighted data could result in the underestimation of standard errors, we used SPSS Complex Samples statistical software, which takes into account the variations in selection probabilities inherent in stratified samples when it performs chi-square tests. We did not adjust for multiple comparisons. Such adjustments can reduce the possibility of Type I error, but they can increase the possibility of Type II error (Perneger, 1998). Rather, we included *p* values so that readers can assess significance.

Results

Numbers of Arrests

In 2006, there were an estimated 3,672 arrests for crimes involving CP possession (95% confidence interval [CI] = 3,338, 4,007), more than twice as many as the estimated 1,713 arrests for such crimes in 2000 (95% CI = 1,529, 1,896, $\chi^2 = 26.32$, $df = 1$, $p = .001$).

Characteristics of CP Offenders

Compared with CP offenders in 2000, a higher proportion of offenders arrested in 2006 were young adults, aged 18 to 25 years ($\chi^2 = 8.48$, $df = 1$, $p = .006$; see Table 1). Although a smaller proportion was married or living with partners, this difference was not significant after adjusting for age. However, even controlling for age, significantly fewer offenders were employed full time ($\chi^2 = 15.59$, $df = 1$, $p = .000$) or lived with children ($\chi^2 = 9.34$, $df = 1$, $p = .004$) in 2006. A somewhat lower percentage had been diagnosed with sexual disorders ($\chi^2 = 7.09$, $df = 1$, $p = .000$), and a somewhat higher percentage were registered sex offenders at the time of their arrests ($\chi^2 = 3.56$, $df = 1$, $p = .03$), but few offenders were in either of these categories.

In many respects, CP possessors arrested in 2006 were similar to those arrested in 2000. They were virtually all male, and the great majority was non-Hispanic White. They were not concentrated in any particular geographic location. Their levels of education and income were similar in both years and ranged widely. Few had backgrounds

Table I. Arrested Child Pornography (CP) Possessors: Demographic Characteristics of Offenders

Characteristics	2000 (*n* = 429), % (*n*)	2006 (*n* = 605), % (*n*)
Male	100 (427)	99 (602)
Age		
Younger than 18 years old	3 (14)	5 (28)
18 to 25 years old	11 (47)	18 (94)**
26 to 39 years old	41 (170)	28 (179)***
40 years or older	45 (198)	49 (304)
Race		
White, non-Hispanic	91 (386)	89 (544)
Other	9 (43)	11 (61)
Geographical location		
Urban	22 (101)	24 (144)
Suburban	32 (141)	31 (183)
Large town	13 (57)	10 (61)
Small town	24 (89)	20 (115)
Rural	9 (41)	16 (102)
Education		
High school or less	43 (164)	43 (247)
Some college education or technical training	40 (189)	35 (224)
College graduate or more	20 (97)	16 (110)
Do not know	17 (76)	22 (134)*
Full-time employment		
Yes	73 (316)	61 (394)***a
No	27 (113)	39 (211)
Household annual income		
Less than $20,000	18 (74)	18 (97)
$20,000 to $50,000	41 (178)	36 (229)
$50,000 to $80,000	17 (81)	18 (105)
More than $80,000	10 (43)	11 (62)
Do not know	13 (53)	18 (112)
Marital status		
Single (never married, divorced, separated, widowed)	62 (265)	69 (401)*b
Married or living with a partner	38 (164)	31 (204)*b
Access to children		
Lived with children younger than 18 years	31 (134)	22 (152)**a
Access through job or group activities	16 (80)	19 (135)c
Psychosocial problems		
Diagnosed with mental illness	5 (25)	6 (35) c
Diagnosed as pedophile or other sexual disorder	3 (20)	1 (10)***ac
Known to be violent (ever)	12 (57)	12 (69)
Problems with drugs or alcohol	18 (72)	20 (118) c

(continued)

Table 1. (continued)

Characteristics	2000 (*n* = 429), % (*n*)	2006 (*n* = 605), % (*n*)
Criminal history		
Prior arrest for nonsexual offense	22 (92)	27 (155)
Prior arrest for sex offense against minor	10 (50)	9 (64)
Registered sex offender at time of crime	3 (16)	5 (39)*[a]
Case involved more than one offender	3 (17)	5 (30)

Note: *N*s are unweighted and percentages are weighted. *N*s and percentages may not be proportionate because results are weighted to reflect selection probabilities and some cases have more influence than others.
a. Difference remains when adjusted for age.
b. No significant difference when adjusted for age.
c. More than 5% missing data; most missing values are because investigators did not have complete information about every case.
***$p \leq .001$. **$p \leq .01$. *$p \leq .05$.

that included mental illness, violence, substance abuse, or prior arrests for sexual or other offenses. Few cases involved multiple offenders.

Nature of CP Possessed by Arrested Offenders

In 2006, a larger percentage of arrested CP possessors had images of children younger than 3 ($\chi^2 = 8.68$, $df = 1$, $p = .012$; see Table 2). Also, larger proportions of offenders had images solely of children who appeared to be younger than 12 ($\chi^2 = 14.11$, $df = 1$, $p = .000$); morphed, computer-generated, or virtual images ($\chi^2 = 9.26$, $df = 1$, $p = .000$); CP videos ($\chi^2 = 33.31$, $df = 1$, $p = .000$); 1,000 or more still images ($\chi^2 = 4.65$, $df = 1$, $p = .03$); and 50 or more videos ($X^2 = 13.36$, $df = 1$, $p = .000$).

However, the nature of CP possessed by arrested offenders remained unchanged in several ways. In both 2006 and 2000, most arrested offenders had images mostly of girls, with a similar minority having images of mostly boys and about 15% with images of both sexes in about equal numbers. In both 2006 and 2000, most offenders had images that showed penetration of a child and sexual contact between children and adults. There was no significant difference in the percentage that possessed violent images (i.e., brutality beyond sexual assault).

Also, despite the increases in arrests of those with more than 1,000 still images or more than 50 videos, many offenders did not have such large quantities of CP. In both 2006 and 2000, more than 30% of offenders had 100 or fewer still images (31% in 2006, 37% in 2000, *ns*, controlling for cases where the number of images was unknown); in 2006, relatively few offenders had more than 50 videos.

In 2006 cases, 5% of respondents said there was evidence that CP possessors had used the Internet to view images of children being abused via web camera. (We did not ask this question about 2000 arrests.)

Table 2. Arrested Child Pornography (CP) Possessors: Nature of CP Possessed

Characteristics	2000 (*n* = 429), % (*n*)	2006 (*n* = 605), % (*n*)
Age of children in possessed CP		
Less than 3 years old	19 (83)	28 (169)**
3-5 years old	39 (171)	46 (274)
6-12 years old	83 (362)	86 (524)
13-17 years old	75 (337)	67 (409)*
Had images of children 12 years or younger only	17 (64)	27 (159)***
Had images of children 13-17 years only	8 (38)	7 (44)
Gender of children in possessed CP		
Mostly girls	71 (300)	69 (406)
Mostly boys	14 (70)	17 (101)
About equally both sexes	15 (59)	15 (98)
Possessed CP depicted		
Graphic sexual images	92 (405)	94 (574)
Penetration of the child, including oral sex	80 (356)	82 (504)
Sexual contact between adult and child	71 (326)	75 (462)
Violence	21 (95)	24 (153)
Nudity or seminudity, but not graphic	79 (356)	82 (494)
Morphed, computer-generated, or virtual images	3 (20)	8 (51)***
Possessed CP videos	39 (174)	58 (368)***
Possessed text describing child sexual abuse	Not asked	11 (75)
Possessed nonsexual images of children	Not asked	21 (124)
Evidence that offender watched real-time images of abuse	Not asked	5 (26)
Numbers of still images		
None (videos only)	4 (17)	3 (21)
Less than 50	26 (105)	21 (108)
Between 50 and 100	11 (55)	10 (58)
Between 101 and 999	34 (140)	23 (147)
Between 1,000 and 9,999	11 (58)	14 (90)
Between 10,000 and 99,999	3 (17)	4 (30)
100,000 or more	<1 (1)	2 (11)
Do not know	10 (36)	24 (140)***
Had more than 1,000 still images	14 (76)	20 (131)*a
Numbers of CP videos		
None (still images only)	57 (244)	41 (236)
Less than 50	24 (109)	28 (174)
50 or more	8 (37)	16 (105)***
Do not know	11 (39)	14 (90)
Had pornography featuring adults	71 (319)	68 (419)
Known CP distributor	33 (142)	39 (242)
Distributed CP online	31 (134)	38 (234)

Note: *N*s are unweighted and percentages are weighted. *N*s and percentages may not be proportionate because results are weighted to reflect selection probabilities and some cases have more influence than others. Some percentages may not add to 100% because of rounding.
a. Difference remains when adjusting for missing data. Missing values on all variables range between 6% and 11%. Most missing values are because investigators did not have complete information about every case.
*** $p \leq .001$. ** $p \leq .01$. * $p \leq .05$.

Table 3. Arrested Child Pornography (CP) Possessors: Technology Use

Characteristics	2000 (*n* = 429), % (*n*)	2006 (*n* = 605), % (*n*)
CP images were found on		
A hard drive	84 (365)	90 (538)**
Removable media	47 (201)	37 (236)**
Either hard drive or removable media	92 (394)	95 (570)
Cell phone	Not asked	1 (5)
iPod or other MP3 player	Not asked	1 (5)
Digital memory card	Not asked	1 (5)
Location of computer primarily used in crime		
Home	91 (379)	77 (488)***
Work	7 (39)	3 (24)**
Other, including laptop used in multiple places	2 (11)	19 (87)***
Used laptop in multiple places	not asked	18 (101)
Used more than one computer	18 (96)	14 (93)[a]
Ever used work computer	17 (86)	6 (47)
Used any technical method to hide images	20 (90)	19 (107) [a]
To hide images, used		
Password protection	12 (52)	9 (52)[a]
Encryption	6 (25)	3 (14)*,[a]
Remote storage	2 (8)	4 (17)*,[a]
Anonymous remailer	<1 (2)	1 (9)***,[a]
Embedded images (steganography)	0 (0)	1 (5)[a]
Used a peer-to-peer network	4 (19)	28 (160)***,[a]

Note: *N*s are unweighted and percentages are weighted. *N*s and percentages may not be proportionate because results are weighted to reflect selection probabilities and some cases have more influence than others. Some percentages may not add to 100% because of rounding.
a. More than 5% missing data; most missing values are because investigators did not have complete information about every case.
***$p \leq .001$. **$p \leq .01$. *$p \leq .05$.

CP Distribution

In 2006, 39% of arrested CP possessors also distributed CP, compared with 33% in 2000 ($\chi^2 = 4.02$, $df = 1$, $p = .055$). Almost all of this distribution was via the Internet ($\chi^2 = 5.31$, $df = 1$, $p = .028$), although a few offenders distributed images face-to-face or through the mail.

Technology Use of CP Possessors

In both 2006 and 2000, the great majority of cases involved images found on computer hard drives or removable media (see Table 3). In both years, about one in five arrested CP possessors used technological methods to hide images, but most were using password protection rather than more sophisticated methods such as encryption

or steganography. In 2006, few arrested offenders had images on cell phones (1%), MP3 players (1%), or digital memory cards (1%). There was a large increase in the percentage of offenders who had used p2p networks to download CP ($\chi^2 = 81.75$, $df = 1$, $p = .000$).

CP Possessors Who Used Peer-to-Peer Networks

We examined whether users of p2p file sharing networks differed from those who used other means to access CP among offenders arrested in 2006 (p2p users, unweighted $n = 160$; others, unweighted $n = 445$). P2p users were more likely to have images that depicted children younger than 3 (40% vs. 23% of others, $\chi^2 = 18.45$, $df = 1$, $p = .000$), sexual penetration (93% vs. 78%, $\chi^2 = 16.92$, $df = 1$, $p = .000$), and violence (39% vs. 18%, $\chi^2 = 28.95$, $df = 1$, $p = .000$). They were also more likely to have CP videos (78% vs. 51%, $\chi^2 = 37.67$, $df = 1$, $p = .000$) and more than 1,000 still images (26% vs. 17%, $\chi^2 = 6.09$, $df = 1$, $p = .012$). Users of p2p networks also accounted for much of the CP distribution among offenders arrested in 2006, with 93% identified by respondents as distributors compared with 19% of others ($\chi^2 = 280.93$, $df = 1$, $p = .000$).

There were marked differences in the CP that p2p users possessed, but only one personal characteristic distinguished this group from other offenders arrested in 2006. A significantly higher proportion were aged 25 years or younger (35% vs. 19% others, $\chi^2 = 17.74$, $df = 1$, $p = .001$). There were no differences in other demographic traits, psychosocial characteristics, or criminal history.

Dual Offenders: CP Possessors Who Committed Concurrent Child Sexual Abuse

In 2006, there was an increase in the percentage of offenders who were charged solely with CP possession and no sexual abuse crimes (i.e., sex crimes that directly victimized known minors or involved undercover investigators posing online as minors): 59% compared with 45% in 2000 ($\chi^2 = 17.49$, $df = 1$, $p = .000$; see Table 4). There was a corresponding decrease in the proportion of "dual offenders" (i.e., those whose crimes involved both CP possession and concurrent completed or attempted child sexual abuse, either Internet related or not). In 2006, 41% of all arrested CP possessors were dual offenders versus 55% in 2000.

This decrease in the proportion of dual offenders may be explained by changes in how CP possession cases started in 2006 compared with 2000. In 2006, it was considerably more common for CP possession to be the first sexual offense investigated by agencies in cases where offenders were arrested for CP ($\chi^2 = 29.49$, $df = 1$, $p = .000$). Only 12% of CP possession cases were first investigated as child sexual abuse crimes, compared with 31% of cases in 2000 ($\chi^2 = 55.32$, $df = 1$, $p = .000$); 18% were first investigated as solicitations to undercover investigators—about the same as in 2000 (16%). In both these latter situations, police knew they were arresting dual offenders because they had investigated specific allegations of sexual abuse or attempted abuse.

Table 4. Arrested Child Pornography (CP) Possessors: Dual Offenders

Characteristics	2000 (n = 429), % (n)	2006 (n = 605), % (n)
No concurrent sexual abuse[a] crime	45 (187)	59 (340)***
No past arrest for or concurrent sexual abuse crime	41 (166)	55 (316)***
Dual offender (current crime)	55 (242)	41 (265)***
CP possessor		
Solicited an UC investigator posing online as minor	15 (62)	17 (86)
Committed Internet-related family or acquaintance child sexual abuse	19 (86)	13 (113)*
Met victim online	12 (53)	5 (27)***
Produced CP	17 (86)	14 (111)
Committed child sexual abuse not Internet related	10 (43)	10 (72)
CP possession case originated with		
Sexual abuse investigation	31 (135)	12 (92)***
Solicitation to UC investigator posing as a minor	16 (69)	18 (97)
CP possession investigation	53 (225)	70 (416)***
Cases originating with CP possession investigations	(n = 225)	(n = 416)
Found dual offender	17 (42)	16 (76)
Found dual offender or offender with past arrest for sexual abuse crime	25 (62)	21 (100)

Note: UC = undercover. Ns are unweighted and percentages are weighted. Ns and percentages may not be proportionate because results are weighted to reflect selection probabilities and some cases have more influence than others.
a. Sexual abuse includes both contact and noncontact (e.g., online luring) sex crimes against identified minors or UC investigators posing online as minors.
***$p \leq .001$. *$p \leq .05$.

However, when cases originate with investigations of CP possession, police must determine whether an offender has sexually abused a specific, identified child or attempted to do so (e.g., solicited an undercover investigator posing online as a minor) and this can be difficult. Police may find no evidence of crimes involving sexual abuse. Nonetheless, investigations of CP possession detected dual offending by offenders in a considerable number of cases. When we isolated cases that originated with CP possession (Wave 1 $n = 225$, Wave 2 $n = 416$), one in every six cases that started with CP possession detected concurrent sexual abuse crimes in both 2006 and 2000 (16% in 2006, 17% in 2000) and higher proportions detected offenders who had either committed concurrent sexual abuse or been arrested in the past for such crimes (21% in 2006 and 25% in 2000).

We examined whether the dual offenders detected in cases that began with CP possession investigations differed from the offenders who were charged solely with CP possession, combining offenders from both waves of the study (dual offenders $n = 118$, CP only offenders $n = 523$). The main difference was that dual offenders found in cases that started with CP possession were more likely to live with children younger than 18 (37% of dual offenders vs. 20% of CP only offenders, $\chi^2 = 14.05$, $df = 1$, $p = .001$)

Table 5. Arrested Child Pornography (CP) Possessors: Case Outcomes

Characteristics	2000 (*n* = 429), % (*n*)	2006 (*n* = 605), % (*n*)
Case involved		
Federal charges	24 (108)	31 (220)*
State charges	85 (364)	72 (408)***
Both federal and state charges	9 (46)	8 (49)
Case outcome was known	87 (372)	79 (481)***
Cases where outcome was known	(*n* = 372)	(*n* = 481)
Both state and federal charges	10 (43)	8 (41)
Any guilty plea	88 (322)	92 (442)
Any conviction at trial	8 (33)	2 (16)***
Charges were dismissed or dropped	8 (35)	7 (27)
Sentence included incarceration	59 (231)	69 (355)**
Incarceration for more than 5 years	17 (69)	32 (179)***
Incarceration for 1 year or less	16 (58)	10 (43)*
Offender will be on sex offender registry	84 (317)	83 (408)

Note: *N*s are unweighted and percentages are weighted. *N*s and percentages may not be proportionate because results are weighted to reflect selection probabilities and some cases have more influence than others. Some offenders were charged in more than one jurisdiction. They may have pled guilty or been convicted at trial in more than one court or charges may have been dropped in one jurisdiction and pursued in another.
***$p \leq .001$. **$p \leq .01$. *$p \leq .05$.

or have access to children through their employment (20% vs. 11%, $\chi^2 = 8.19$, $df = 1$, $p = .011$). Also, higher proportions had problems with drugs or alcohol (28% vs. 18%, $\chi^2 = 4.87$, $df = 1$, $p = .046$) and prior arrests for sexual offenses against minors (14% vs. 8%, $\chi^2 = 3.37$, $df = 1$, $p = .05$).

Proactive Investigations Aimed at CP Possession

In both 2006 and 2000, approximately 40% of arrests involved proactive investigations of online activity (e.g., law enforcement investigators posing online as minors, monitoring CP trading on p2p networks, tracing financial transactions used to access commercial CP websites; 41% in 2006, 36% in 2000, *ns*). Proactive investigations aimed specifically at CP distribution played an increasing role (23% in 2006 vs. 16% in 2000, $\chi^2 = 6.39$, $df = 1$, $p = .011$).

Case Outcomes

We found a significant increase in the percentage of cases in which federal charges were brought against arrested CP possessors ($\chi^2 = 5.77$, $df = 1$, $p = .029$) and a decrease in cases with state charges ($\chi^2 = 20.23$, $df = 1$, $p = .000$; see Table 5). The great majority of cases with outcomes that were known to respondents ended in guilty pleas. In 2006, a

lower percentage of cases ended in convictions at trial in 2006 ($\chi^2 = 16.67$, $df = 1$, $p = .000$), but there was no change in cases where charges were dropped or dismissed. A higher proportion of offenders were sentenced to incarceration ($\chi^2 = 9.06$, $df = 1$, $p = .01$), and sentences were longer. In 2006, 32% of offenders were sentenced to more than 5 years compared with 17% in 2000 ($\chi^2 = 21.84$, $df = 1$, $p = .000$), and fewer were sentenced to 1 year or less ($\chi^2 = 7.17$, $df = 1$, $p = .012$). In both 2006 and 2000, respondents stated that most arrested offenders would be required to register as sex offenders.

Discussion

In 2006, there were an estimated 3,672 arrests for crimes involving CP possession, more than twice as many as the estimated 1,713 arrests in 2000. Many characteristics of the offenders and the offense remained stable between 2000 and 2006. In 2006, however, a higher proportion of offenders were young adults (aged 18-25 years), had images of children younger than 3, had CP videos, and used p2p networks to access CP. Users of p2p networks had more extreme images and larger numbers of images. In 2006, more cases resulted from proactive police work targeting CP possessors, more offenders received sentences of incarceration, and more were sentenced to 5 or more years. The proportion of "dual offenders," whose crimes involved both CP possession and concurrent completed or attempted child sexual abuse, decreased in 2006. However, this was largely because cases that began with CP possession investigations were more common. These cases are more ambiguous than those that began with investigations of child sexual abuse and then find CP. However, in both 2006 and 2000, one in six cases that began with investigations of CP possession or distribution led to the detection of child sexual abusers. Furthermore, in 2006, one in five such cases detected either dual offenders or offenders with prior arrests for sexual abuse crimes, the latter being a group at high risk for reoffending (Seto & Eke, 2005).

Characteristics That Remained Stable Between 2000 and 2006

Although the number of arrests for crimes involving CP possession more than doubled between 2000 and 2006, the population of offenders and dynamics of the offense remained stable in many respects. In both years, most cases involved individual offenders who were non-Hispanic White males. Their educational backgrounds, incomes, and geographic locations varied widely and similarly across waves. Few had previous arrests for sexual offenses against minors. The proportion of young adult offenders increased in 2006, but young adults still made up less than 20% of those arrested for CP possession in either year. There was no statistically significant increase in arrests of juvenile offenders, and most offenders—more than three quarters—were older than 25 years, in both 2000 and 2006. With measures at only two time points, it is too early to say that an increasing proportion of arrested CP possessors are young adults, although the possibility should be monitored. Most arrested offenders did not live in households with children, and the proportion that did decreased in 2006, even after adjusting for age.

In many respects, the nature of CP possessed by arrested offenders was also stable. In both waves of the study, large and similar majorities of offenders had images that depicted preteen children, sexual penetration, and sexual contact with adults. Most did not have CP that showed children enduring brutal sexual violence and, despite a concerning increase, most offenders did not have pictures of children younger than three. In each year, about one third of those arrested had relatively small numbers of images—100 or fewer. Also, in each year most of those arrested were not known to be CP distributors.

Technological advances between 2000 and 2006 did not appear to have had a big impact on the nature of the crime, with the exception of p2p file sharing networks. Few arrested offenders used technology to hide images, and few used devices such as cell phones, MP3 players, or web cams. CP was found on home or laptop computers in most cases. The overall picture was of a sexual crime committed by lone individuals in their homes, using electronic equipment that was commonly available with skill levels that were easily acquired.

Changes Between 2000 and 2006: The Role of p2p Technology

Even though there was considerable stability in the characteristics of those arrested for CP possession, the technology they used, and the images they possessed, there were also changes. For one, a much higher proportion of offenders had accessed CP via p2p file-sharing networks—about one third in 2006 compared with only 4% in 2000. There were also troubling increases among 2006 offenders in the percentage who possessed images of children younger than 3, videos, and large numbers of images. These increases were related to the rising use of p2p networks to acquire images. Offenders arrested in 2006 who used p2p networks were more likely to have such images and larger numbers of images compared with other 2006 offenders, and they were more likely to distribute CP. However, there was no evidence that p2p users were more deviant or criminal than other offenders arrested for CP possession in 2006 in terms of psychosocial characteristics or criminal history. In fact, the only personal characteristic that distinguished p2p users was age. As a group, they were significantly younger than offenders who used other online venues to acquire CP. It is possible that younger offenders were more familiar with p2p technology and thus more likely to use it.

Two factors may account for differences in the nature and numbers of images found among p2p users compared with other CP possessors. The first is the dynamics of p2p technology. P2p networks allow users to download files directly from computers that belong to other individuals in a network. Available files are labeled with a string of key terms that would cause them to be found in searches. Steel (2009) found that p2p users searching for CP often used broad single-word search terms, for example, "pedo" ("pedophile"), apparently to maximize the number of images they received in response to a query. In contrast, those who supplied images generally labeled them with multiple key words, to increase the likelihood searchers would find them. Steel found that less than 1% of p2p CP searchers included key words that suggested they

sought violent material, but many of the available files had labels that suggested violent content, along with more general key words. A search for "pedo" might capture such files, even if offenders were not specifically looking for violent content. The small amount of research that exists about other means of acquiring CP online indicates offenders who do not use p2p networks may be more targeted and deliberate in their searches (Jenkins, 2001; Quayle & Taylor, 2003; Taylor & Quayle, 2006).

This is not to suggest that offenders who download CP from p2p networks are less culpable than other CP offenders. However, the increase in offenders with images of young children may be driven by the dynamics of p2p networks rather than by increasing tastes for images of very young children.

A second factor that could account for differences between p2p users and other arrested offenders is case triage by law enforcement. Programs used by police to uncover CP trading via p2p networks can determine the content and number of images traded by specific individuals (M. Liberatore, personal communication, July 30, 2009). Because police lack the resources to investigate all persons they detect using p2p networks for CP, they may be targeting p2p users who have larger numbers of images and more extreme content.

Did the Problem of CP Possession Worsen Between 2000 and 2006?

CP possession is clearly a serious crime, as evidenced by our findings about the nature of images and the victimizations suffered by the children portrayed in them. Although there have been controversies over "borderline" images, such as art photos of naked children and pictures of older teens, such images play virtually no role in cases where people have been arrested for CP possession.

The 2006 increases we found in percentages of offenders with images of children younger than 3 and higher numbers of images are disturbing, but our study could not measure whether increasing numbers of younger children or other victims are being depicted in CP. It could be that the same catalog of images is being disseminated to a larger population of offenders. We did not have information about how many different victims were portrayed in images, when images were created, or how many images of children younger than 3 offenders possessed.

The large increase in arrests for CP possession brings up the question of whether such material became more prevalent, easier to access, or used by a widening number of offenders between 2000 and 2006. Our research had no way to measure directly whether availability or use of CP actually increased. Between 2000 and 2006, overall Internet use rose from about 63% to 77% of the adult population (Harris Interactive, 2008). With more individuals using the Internet, there certainly may have been more using it for illegal purposes. However, the growing number of arrests could also be explained by increasing law enforcement activity to identify and arrest offenders for CP possession, even in the absence of increasing CP use; some of the study findings support such an explanation. Comparing 2006 to 2000, a higher proportion of arrests solely involved CP possession, more cases originated with investigations of CP

possession, and more involved proactive investigations aimed at detecting CP. More cases were charged federally, more offenders were sentenced to incarceration, and sentences were heavier. There was no indication that a court ruling requiring prosecutors to establish that images were of real children was impairing prosecutions. These findings indicate that more law enforcement resources were directed toward CP possession, a result that is consistent with information about new investigative tools, procedures, and training that law enforcement has developed and disseminated in this area (U.S. Department of Justice, 2007, 2008).

It is also important to point out that although the percentage of dual offenders decreased among the total of CP possessors from 55% to 41%, there was no decrease in the percentage of dual offenders who were identified in investigations that started with CP possession. Our findings suggest that the drop in dual offenders was because of a large increase in cases beginning with investigations of CP. There was no evidence that law enforcement was pursuing less serious offenders or fewer cases that led to the detection of abusers. In both waves of the NJOV Study, one out of every six cases that began with an investigation of CP found a dual offender who had also sexually abused a child or attempted to do so. It is clear that targeting CP possessors does reveal a considerable number of child sexual abusers as well, particularly among those offenders who live with children or have access to children through employment.

Limitations

Several limitations must be noted. First, our data pertain only to CP possession cases that ended in arrest. Second, all the data were gathered from law enforcement investigators. They did not always have full information about every case, and they could provide only limited data about offender behavior. Some of their answers could have been biased by training, professional attitudes, or the adversarial nature of their roles in some cases. Third, these numbers are estimates based on the sample of cases that were the subject of interviews. Although the study was designed to yield a nationally representative sample of cases, sometimes samples are randomly skewed. The margin of error could be larger than calculated. Fourth, we conducted multiple significance tests, which can increase Type I error. Finally, keeping up with rapidly changing technologies and police responses is a challenge for researchers. Aspects of crimes involving CP possession may have changed since 2006.

Conclusion

There is a clearly growing law enforcement interest in the investigation and prosecution of CP possession, an interest that would certainly benefit from increased knowledge and social science research. Among the top priorities would be a better understanding of the offender population and how to differentiate them according to the risks they pose. In addition, more knowledge is needed to develop strategies for prevention and ways to effectively discourage the use and production of CP. Studies about the effects

of CP consumption and about the effects of such media on children depicted are also of considerable importance. Increased empirical knowledge is an important tool to combat the problem, raise awareness, and increase the effectiveness of law enforcement activity in this area.

Authors' Note

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