Production and Active Trading of Child Sexual Exploitation Images Depicting Identified Victims

RESEARCH TEAM

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Table of Contents

DATASETS

1) HISTORICAL

- Actively traded cases involving identified victims: July 1, 2002 — June 30, 2014

- 518 cases involving 933 identified victims

2) MODERN

- All cases involving identified victims: July 1, 2011 — June 30, 2014

- 1,965 cases: one offender and one victim

- 633 cases: multiple offenders and/or victims

The National Center for Missing & Exploited Children (NCMEC) has access to unique data about child exploitation images, particularly those involving identified victims and offenders and reported by multiple law enforcement agencies.

Through the cooperation of NCMEC, and with the financial support of Thorn, we were able to extract data from NCMEC databases to address multiple research questions.

The primary objective in this project was to develop knowledge to assist law enforcement in identifying victims of child sexual abuse material and intervening to prevent child sexual exploitation and abuse.

In this study, the first of its kind, we were able to analyze data from two different datasets: (1) a historical dataset that encompassed all actively traded cases involving identified victims from July 1, 2002, to June 30, 2014 (518 cases involving 933 victims); (2) a modern dataset encompassing all cases involving identified victims from July 1, 2011, to June 30, 2014 (1,965 cases involving one offender and one victim, and 633 cases involving multiple offenders and/or victims; only a small minority of these cases were actively traded). The historical set allowed us to examine trends over time, whereas the modern dataset had more information due to a more comprehensive law enforcement submission form implemented in 2011.

Report Highlights

1 The most notable historical finding was a trend toward more egregious sexual content over time, with more cases involving explicit sexual conduct in later years. In contrast, there were no obvious trends in terms of child victim age or gender.

2 In cases involving a single victim and single offender, actively traded cases were associated with having prepubescent victims. Actively traded cases were also associated with more egregious content in terms of sexual activity, and more likely to involve familial offenders, particularly nuclear family members.

3 While most cases involved male offenders who were unrelated to the child, cases involving female offenders, younger children, or more egregious content were more likely to involve familial offenders.

These results have implications for law enforcement investigations regarding adult-created child pornography cases through a better understanding of the relationships between child, offender, and offense characteristics.

The primary objective in this project was to develop knowledge to assist law enforcement in identifying victims of child sexual abuse material and intervening to prevent child sexual exploitation and abuse.

WE WERE ABLE TO EXAMINE THE FOLLOWING RESEARCH QUESTIONS:

1. From data about all identified, actively traded cases (involving 5 or more reports to NCMEC) from 2002 to 2013, are there longer-term trends in the nature of the content analyzed by NCMEC, in terms of the age, gender, or sexual activity involving depicted children?

From data involving identified child victims between July 1, 2011, and June 30, 2014, whether actively traded or not, we examined the following research questions, first by focusing on data from cases involving a single offender and a single victim, and then including cases involving multiple offenders and/or victims:

2. Was actively traded status (5 or more reports to NCMEC) associated with victim age or gender, offender age or gender, sexual activity level, or relationship between offender and victim?

3. Given some offenders were family members of victims, was familial relationship associated with victim age or gender, offender gender, or sexual activity level?

Online child sexual exploitation is an international problem, because these production and distribution technologies transcend national borders. There is also wide variation in child pornography laws around the globe, according to a recent review by the International Centre for Missing & Exploited Children (2016). There are growing concerns about the sexual exploitation and abuse of children as new technologies create more opportunities for perpetrators (Seto, 2013). Although the total number of children who have been sexually exploited or abused and photographed is unknown, the number of arrests for adult-produced child pornography in the U.S. practically doubled between 2000 and 2009, resulting in more than 1/3 of arrested producers of child pornography in 2009 being adults who created the images of the children themselves (37%) (Wolak, Finkelhor, & Mitchell, 2012).

There is limited scientific understanding of the characteristics of these children who are victimized in child pornography images/videos and their relationship with those who have sexually abused them. It is not known how these factors may change over time or vary across sociocultural contexts such as ethnicity or poverty. Existing research has provided some insight about cohorts of identified children, or of images seized from the computers of offenders, but there are many unaddressed questions. More is known about perpetrators than victims at this time (e.g., Long et al., 2016; Quayle & Jones, 2011; Seto, 2013; Seto & Eke, 2015, in press; Seto, Wood, Babchishin & Flynn, 2012; Taylor & Quayle, 2003).

Knowledge gained from this research can lead to a better understanding of online victimization and offending, thereby supporting more effective and efficient prevention and law enforcement initiatives to protect children. The results of this research could have international impact given the professional networks the researchers have in their respective countries and the relationships NCMEC has with the international law enforcement community. For example, there are many questions about **longer-term trends** in the production of child exploitation content, and whether more actively traded content differs from non-traded content in victim or offender characteristics.

Given younger children appear to be at greater risk of sexual abuse by family members than from non-relatives, reflecting access and opportunity (Snyder, 2000), is it also the case that exploitation content depicting younger children are more likely to involve familial offenders? Finding this association could help guide law enforcement investigations. As another example, evidence that child characteristics, such as gender and age, are related to **distribution** or other offending characteristics would support the development of computer algorithms to categorize large collections of child exploitation images. Seto and Eke's (2015) predictive research has shown the ratio of boy to girl content is associated with the likelihood of future sexual offending, so finding associations between child gender and other study variables would extend this research.

THE TEAM

Principal Investigator: Michael Seto, PhD, forensic research director at the Royal Ottawa Health Care Group and an Associate Professor in Psychiatry at the University of Toronto, with cross-appointments to Ryerson University, Carleton University, and the University of Ottawa (Canada).

Co-Investigators: R. Gregg Dwyer, MD, EdD, Associate Professor and Director of Community and Public Safety Psychiatry, Director of the Sexual Behaviors Clinic and Lab, Department of Psychiatry and Behavioral Sciences, Medical University of South Carolina (USA).

Ethel Quayle, PhD, Reader, School of Health and Social Science, University of Edinburgh (Scotland).

Research Coordinator: Cierra Buckman, MHS, Senior Research Program Coordinator at the Moore Center for the Prevention of Child Sexual Abuse, Bloomberg School of Public Health, Johns Hopkins University (USA).

The work was completed in collaboration with the *National Center for Missing & Exploited Children (NCMEC)* staff.

Database

NCMEC is a private, nonprofit organization established in 1984 (learn more at www.missingkids.org). It was created to help find missing children, reduce child sexual exploitation, and prevent child victimization. NCMEC serves as the national clearinghouse for families, victims, private industry, law enforcement, and other professionals on issues related to missing and sexually exploited children. NCMEC's Exploited Children Division operates the CyberTipline® and Child Victim Identification Program® (CVIP®). CVIP primarily helps to verify whether or not child exploitation images appear to depict children who have been previously identified by law enforcement agencies as actual (rather than virtual or computer-generated) children and helps law enforcement identify new child pornography victims. CVIP maintains a database of information related to child sexual exploitation images, containing both identified and unidentified children.

When NCMEC introduced CVIP in 2002, the record-keeping for identified children was effective, but basic. As CVIP's reputation and recognition grew, so did their program. Law enforcement began seeking their assistance on hundreds and thousands of cases. At this point, CVIP moved their records to a case management system and formalized submissions with a law enforcement submission guideline form. The form's first edition was still rather simple and asked for standard information, such as data about the victims involved in the case, the jurisdiction, a point of contact and such. *[Please note, NCMEC does **not** request nor record the names of victims in any of its systems.]* However, the process quickly became more sophisticated and they added new variables and categories to each iteration of the guideline form. By 2014, the submission guideline contained multiple pages and additional case details were requested and captured in the system. Data from each submission was now entered into its respective field and images were coded by analysts based on their content.

The CVIP database provides a unique opportunity for research related to online sexual exploitation and abuse of children because it is a central repository for data that crosses geographical, jurisdictional, and operational lines. CVIP works in conjunction with several national and international organizations to move cases along as quickly as possible. They also work closely with law enforcement agencies, internet service providers, victim attorneys, and child welfare organizations throughout the U.S. They have processed millions of cases and helped to identify thousands of child sexual abuse victims. As a result, their database has access to very large, broad, and unedited datasets, including information about child pornography collections, victim characteristics, and offender characteristics.

Vocabulary

Given the evolution of the NCMEC database, the information in the CVIP records was not originally intended or designed for research purposes. As such, historically they used in-house language for variables. In an effort to fully capture the nuances of their database, we have adopted their language for certain variables and categories as well. Below are a few key definitions to help readers understand the data as we describe our collection process and analytical methods.

Case/Series — A series is a group of images focusing on a specific child(ren) and, when traded or collected, is most often done so as a set. "Series" and "case" are synonymous within this report.

Actively Traded — A term designated by NCMEC referring to a series that has been seen in 5 or more CyberTipline Reports and/or CVIP case reviews.

Victim — Any child visible in the material who is younger than 18. Please note, only identified victim data have been included in this analysis.

Offender — The person who is proven or believed to have produced and/or enticed or coerced the images to be produced by a child.

Age Category — This is coded based on physical development of the victim (limited to three categories: infant/toddler, prepubescent, and pubescent) based on the youngest appearance of a child in a series of images or videos.

The database also includes other high-interest variables, some which are coded on a series-level and some which are coded on an individual-level. Those coded on a series-level reflect data for the series overall regardless of number of victims and/or offenders. Those coded on an individual-level reflect data for that specific child victim or offender. Below is a list of some of these variables, and how they were coded.

VARIABLE	CODING LEVEL	DESCRIPTION
Gender	Individual	Gender of child victim/offender
Ethnicity	Individual	Ethnicity of child victim/offender
Relationship of Abuse to Child	Individual	Categorization of the relationship between each child victim and each offender
Jurisdiction	Series	Specific U.S. state or "International" designation of where the files were produced
Date NCMEC Received the Submission	Series	Date NCMEC received the case submission by law enforcement
Approximate Time Frame of Production	Series	Date provided by law enforcement indicating time frame of production of the series
Number of Images	Series	Approximate number of images and videos in the series
Sexual Activity Checklist	Series	Categorization of the sexual activity depicted in the images and videos

Additional fields on both individual- and series-levels were also reviewed during the study. However, the definitions of these variables are much more straightforward and align with existing definitions in the research literature.

Inclusion and Exclusion Criteria

Data for our investigation was limited to cases with an identified victim and one or more adult offenders. Since access to the images and videos is restricted, for the content variables, we examined descriptors of series, counts of media, and checklists of the sexual activity depicted. Given the amount of missing information on early-identified victims, we chose to have separate datasets from their database. Since we wanted to include some of the more historical cases, in our first dataset, we chose to only include actively traded cases with an identified victim. In our second dataset, we chose to exclude cases before 2011.

Data Collection Method

The team's research coordinator began working onsite at NCMEC at the end of December 2014. After a brief orientation, the lead analysts at NCMEC presented Ms. Buckman with several spreadsheets containing the raw variables for the first set of data. This first dataset, the historical dataset, contains all actively traded cases — defined by NCMEC as having been reported on five or more times — from July 1, 2002, to June 30, 2014. The second dataset, the modern dataset, contains all cases involving identified child victims from July 1, 2011, to June 30, 2014.

As discussed earlier, NCMEC receives a wide range of information about a given case from law enforcement, however, information is often separated into different management systems. For instance, one system tracks information related to images and videos, another tracks jurisdictional information and technical aspects of a case, and a third stores information concerning the series submission to NCMEC. Given the method by which the variables were queried, compiling the data into one database would have greatly limited the analysis. Therefore, the team opted for a more comprehensive approach and asked Ms. Buckman to synthesize the raw data into two different databases: cases

where there is only one identified victim-offender relationship and cases with multiple identified victim-offender relationships. Using this layout, a closer examination of the relationship between offender and victims is possible, while still answering questions surrounding case-level information.

While CVIP's services are extremely helpful to most law enforcement, many officers fail to update cases with important information or fully complete the law enforcement submission form. To compensate for the missing data, Ms. Buckman coded case documents for each series to fill in as much missing information as possible and to capture additional variables that NCMEC could not query from their data management systems. The co-investigators determined that variables needed to be at least 80% complete to ensure reliable statistical calculations and validity. At NCMEC's suggestion, Ms. Buckman developed a follow up survey for law enforcement to collect the variables that still did not meet the 80% threshold.

A summary of the variables selected, scales for sexual activity, and scale for offender-victim relationship, is provided in the Appendix.

Sample Selection

It is important to note, while this dataset is highly unique and offers a valuable insight into a combination of perspectives (it combines offender, victim, and content data), it also has limitations.

SAMPLE SELECTION OF LAW ENFORCEMENT SUBMISSIONS

Cases received by NCMEC CVIP

Cases identified by NCMEC CVIP

Actively traded cases reported back to NCMEC 5 or more times
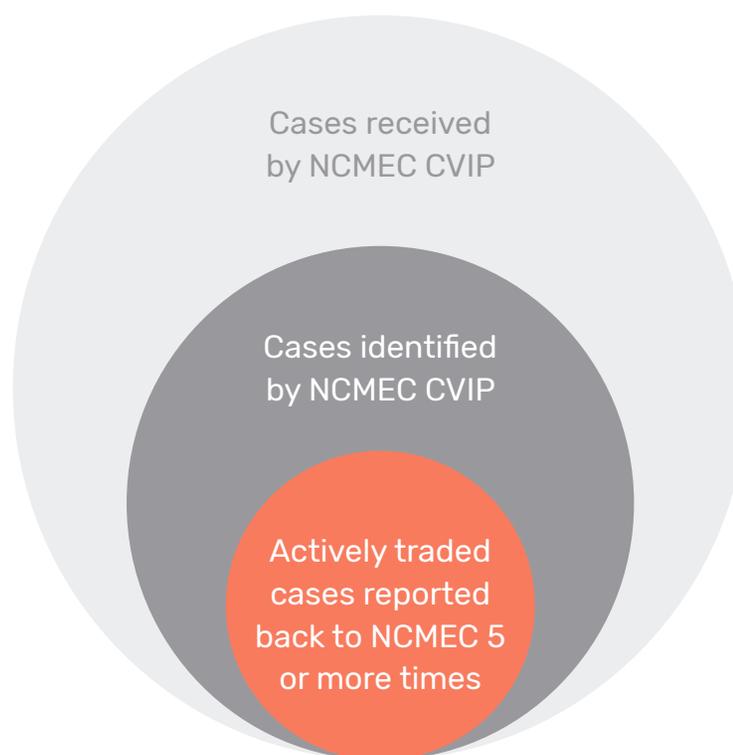
First, because NCMEC is entirely reliant on law enforcement for their information, the dataset excludes cases law enforcement did not pursue as well as information remaining unknown to law enforcement.

Furthermore, to ensure the goal of 80% completion per variable was achieved as well as enough information for each perspective to work with, NCMEC and the research team decided to focus their research efforts on cases involving at least one identified child. This filter was applied to both the historical dataset and the modern dataset. As such, victim information is only reflective of the victims identified in the case, not necessarily all victims present in a case. Likewise, information related to offenders is limited to those who have been reported to NCMEC by law enforcement. Additionally, self-produced cases were excluded in the analyses since their relationships represented a unique type of case.

Moreover, since some cases involve multiple victims and some cases involve multiple offenders or both, the data was looked at from two perspectives: cases involving one victim-offender relationship and cases with multiple victim-offender relationships. These different perspectives allowed the use of variables that had been coded at either the case level or individual level. It is important to make the distinction as to what different variables say in relation to one another. For instance, in the historical dataset, a refined sample (one victim-offender relationship cases) was used to fully explain things such as sexual activity and jurisdiction, both reported at a case level. However, in order to maximize

the number of cases to work with, the multiple relationship data was coded (i.e., if a case had all girl victims the case was considered girl victim or if it had all infant/toddler victims it was counted as infant/toddler victim). For cases with mixed samples (e.g., victims were both boys and girls), a third "mixed" variable was created. This coding strategy was applied to victim age and gender, relationships of victims and offenders, and offenders' gender.

The raw NCMEC data was extremely rich with detail. NCMEC precisely codes the relationship between offenders and victims, marks checklists for sexual activity present, and keeps a variety of case information from distribution method to information concerning how a case was initiated. To make analyses more digestible, many of the variables supplied to the team were grouped and scaled to aid in dissemination and assist in mapping findings onto existing literature. These scales and groupings are listed in the Appendix.

The final sample criterion, only applied to the historical dataset, was actively traded status as defined by NCMEC as having been seen in 5 or more CyberTipline reports and/or case submissions by law enforcement to CVIP. Due to changes in the law enforcement submission guidelines it was impossible for early, non-actively traded cases to match the level of detail of modern non-actively traded cases.

DATASETS

1) HISTORICAL

- Actively traded cases involving identified victims: July 1, 2002 — June 30, 2014
- 518 cases involving 933 identified victims

2) MODERN

- All cases involving identified victims: July 1, 2011 — June 30, 2014
- 1,965 cases: one offender and one victim
- 633 cases: multiple offenders and/or victims

The first dataset was a historical, cross-sectional slice encompassing all available actively traded cases involving identified victims from July 1, 2002, to June 30, 2014. This provided a look at longer-term trends over time in the nature of the production cases submitted to NCMEC. For the analyses presented in this report, we looked at 518 actively traded cases, which involved 933 victims.

The second dataset was modern and encompassed all cases involving identified child victims from July 1, 2011, to June 30, 2014. The dates for this cross-sectional slice were chosen based on the implementation of a more comprehensive law enforcement submission form in 2011. While the historical dataset shows interesting trends among actively traded cases, some of the older cases (including their case documents) were missing information that is now included in the NCMEC database. Thus, the modern dataset had the benefit of being more complete as well as larger than the historical dataset. There were 1,965 cases involving one victim and one offender, and approximately 7% (N=143) of those cases were actively traded. There were 633 cases that involved multiple relationships between victims and offenders, and approximately 12% (N=75) were actively traded. The larger amount of cases gave increased confidence in statistically significant differences between subgroups and comparisons, such as male versus female victims, male versus female offenders, and familial versus non-familial relationships.

Historic Dataset

Results

The NCMEC historical and modern datasets are unique and rich and could be used to address a number of different questions. In this report, we explore the interaction between victim characteristics, offender characteristics, actively traded status, and the content of the material, with the ultimate goal of developing knowledge to aid NCMEC and law enforcement in their work.

An overview of the project was presented in August 2015 at the Dallas Crimes Against Children Conference (http://www.cacconference.org). Preliminary results were presented at the annual meeting of the Association for the Treatment of Sexual Abusers (www.atsa.com), which took place in Montreal, Quebec, in October 2015.

Historic Dataset

In this report, we have focused our analyses on the modern dataset since it is larger and speaks to current trends in child sexual abuse material, but have presented a few timewise trends from the historical dataset in the tables below.

Table 1 shows the number of actively traded cases involving at least one identified victim by year, using the year the case was first recorded at NCMEC.

Table 1 │ **Historic Dataset Distribution by Year**

YEAR	COUNT OF CASES
2002 and 2003	71
2004 and 2005	75
2006 and 2007	82
2008 and 2009	72
2010 and 2011	110
2012 and 2013	108

Figure 1 | **Year Distribution by Sexual Activity**[1]
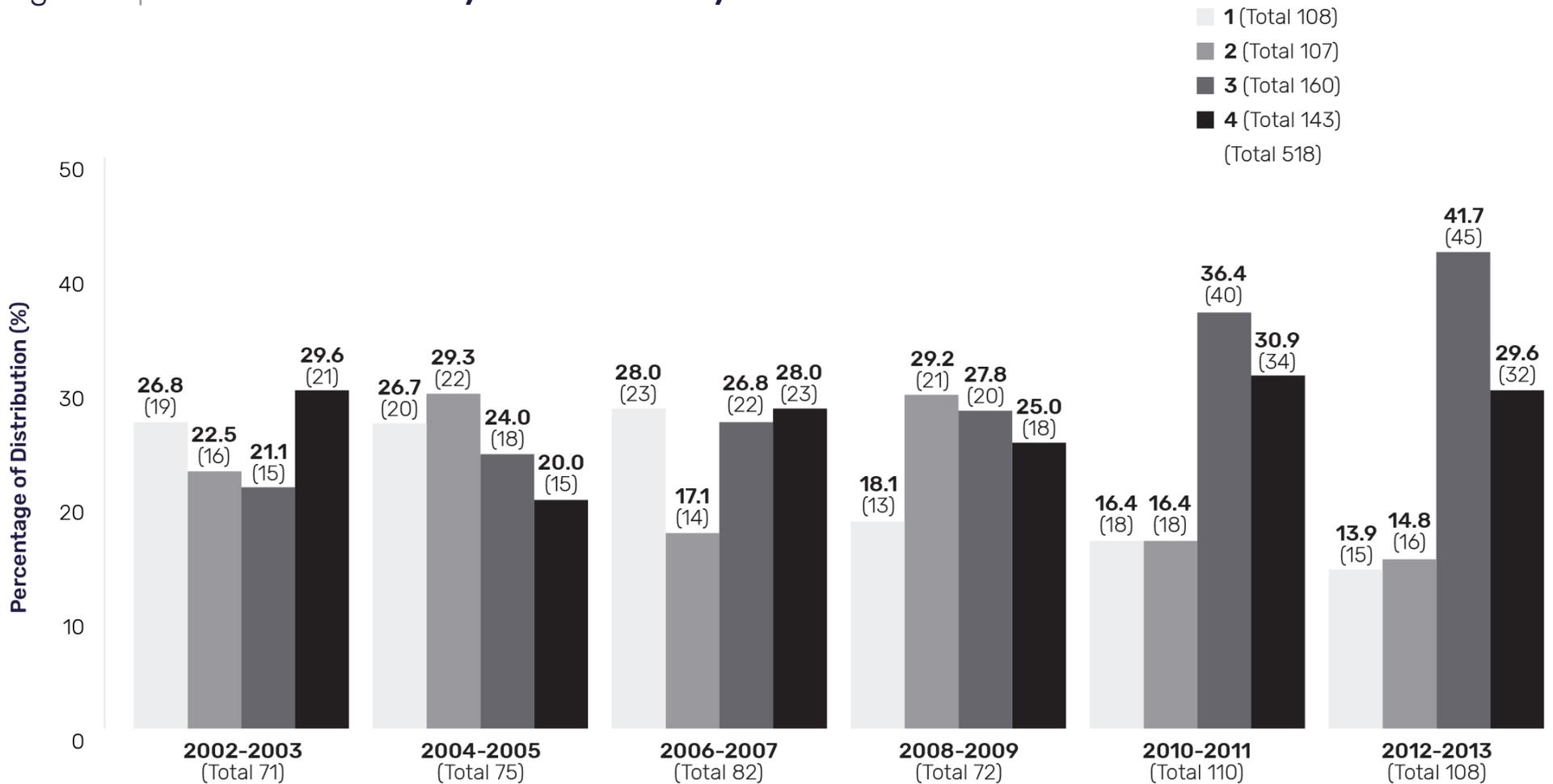
Figure 1 shows the sexual activity of each case across years. Of note, sexual activity is graded for the highest activity depicted in a series of images. **The association is explained by a greater prevalence of images at levels 3 or 4 in later years.**

[1] Percentages don't always sum to 100% due to rounding. The sexual activities scale is shown on the following page and in the Appendix as Table 4.

Table 2 │ **4 Point Sexual Activity Scale**

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1 Nudity or erotic posing with no sexual activity. (Level 1 on SAP Scale)
- Fully clothed erotica
- Erotica present
- Exposed genitals or anus
- Exposed breasts or chest
- Other sexual explicit content (i.e. fetishes)
- Full nudity

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2 Non-penetrative sexual activity between children, adults and children, or masturbation. (Level 2+3 on SAP Scale)
- Licking
- Kissing
- Manual stimulation
- Oral copulation

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3 Penetrative sexual activity between adults and children. (Level 4 on SAP Scale)
- Anal or vaginal penetration
- Ejaculation seen

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4 Sadism or Bestiality (Level 5 on SAP Scale)
- Drugged / Sleeping
- Bestiality
- Bondage
- Defecation
- Urination

Figure 2 | **Year by Victim Age**

There is a **relative shift** for 2008-2009 with similar proportions in other years.

Legend:
- ■ **Infant/Toddler** (Total 87)
- ■ **Prepubescent** (Total 606)
- ■ **Pubescent** (Total 240)
- (Total 933)
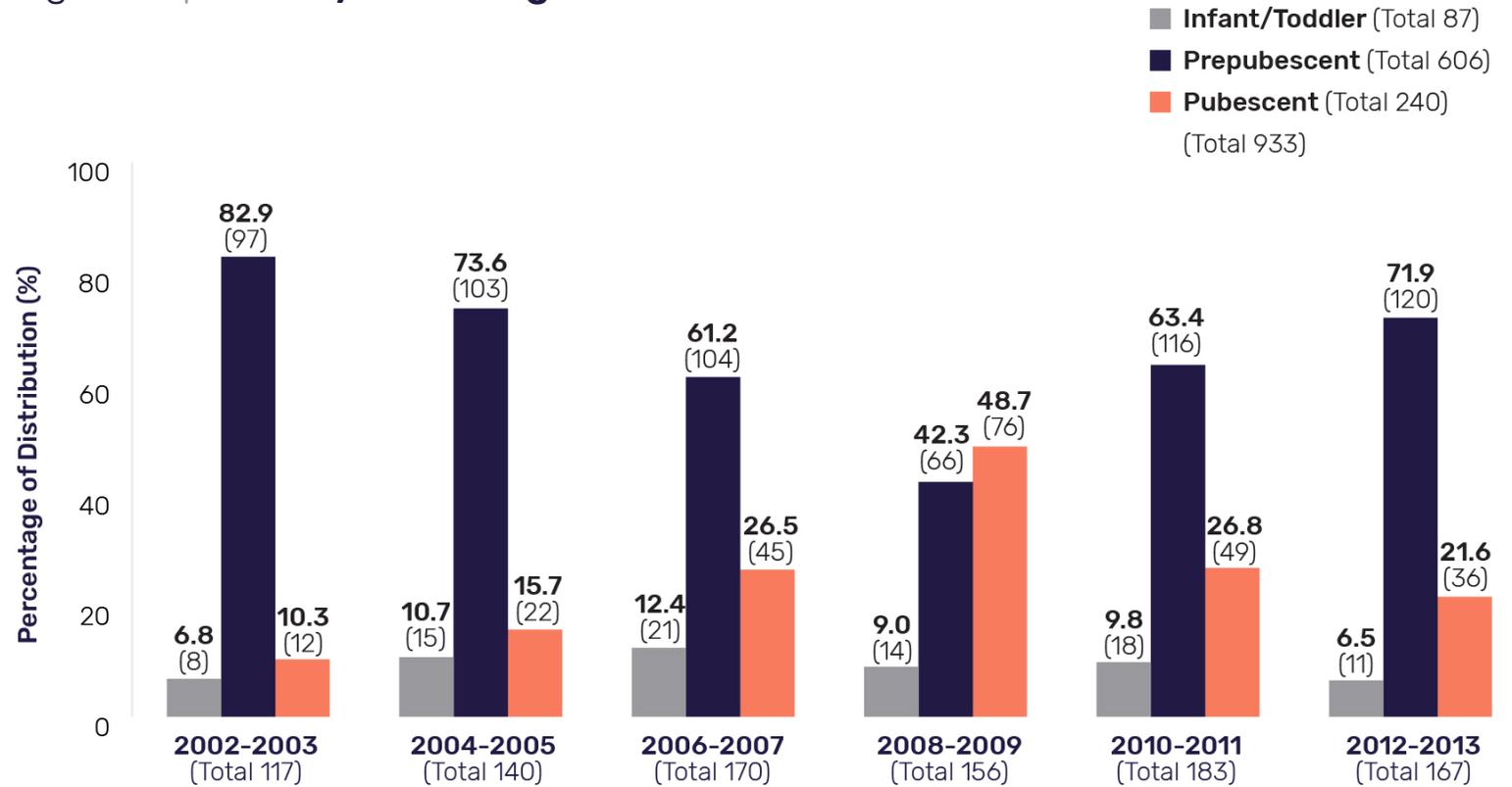
Figure 2 shows the age category of all identified victims across the year distribution. Of note, some cases involve multiple victims, hence why the number of victims is larger than the number of actively traded cases. **The association is explained by a shift to relatively more pubescent victims in 2008 – 2009, with more similar proportions in other years.**

Figure 3 | **Year by Victim Gender**

KEY

■ **Female** (Total 574)
■ **Male** (Total 359)
(Total 933)
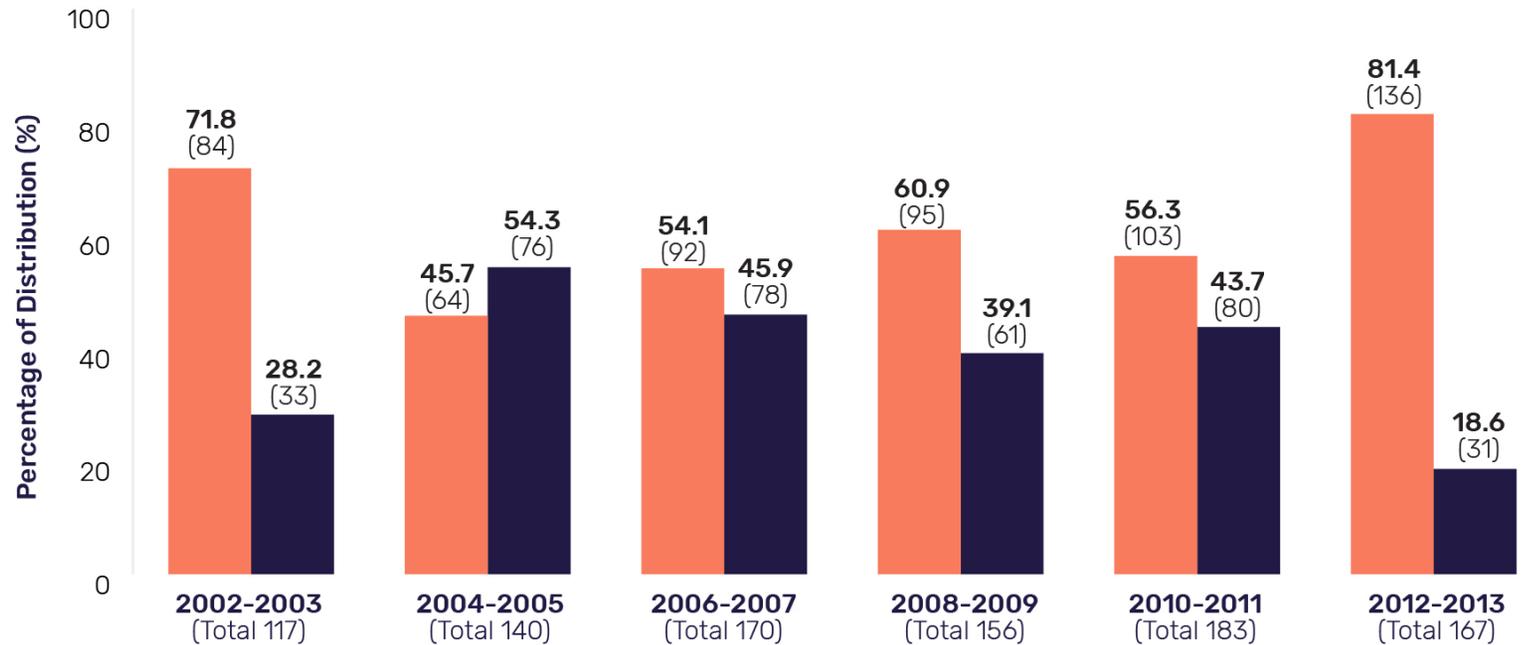
Figure 3 shows the gender of all identified victims across the year distribution. Of note, some cases involve multiple victims, hence why the number of victims is larger than the number of actively traded cases.

There was **significant variation in the proportion of male victims over time, but there was no obvious trend** because the percentage increased from the first period and then substantially decreased in the last period.

Modern Dataset

Modern Dataset

In the modern dataset, we subdivided the data into cases that involved only one relationship (one victim and one offender) and cases that involved multiple relationships (either multiple victims or offenders or both).

In the one relationship subgroup, victims were predominantly white (85%), pubescent (61%) females (76%) with non-familial relationships (74%) to white (86%) male (98%) offenders. In our second perspective, which looked at cases with multiple victim–offender relationships, victims were also predominantly pubescent (42%) female (62%) with non-familial relationships (59%) to male (82%) offenders. Most content in the one-to-one series involved level 1 sexual activity (40%), whereas those series with multiple relationships involved more level 3 content (30%). See Table 3 on the following pages.

We have not included offender ethnicity in our general descriptive table or our analysis because of the extent of the missing data; this variable did not meet our 80% threshold. This is most likely due to the fact that it is hard to judge the ethnicity of depicted persons as a result of poor photo quality or when only partial figures (i.e., arms, legs) were visible. NCMEC coding was conservative and so entries were only made if analysts were confident. The law enforcement survey also had a low yield for this variable as well.

Table 3 | **Modern Dataset Characteristics**

	ONE ON ONE (N=1,965)	MULTIPLE RELATIONSHIPS (N=633)
RELATIONSHIP BREAKDOWN		
Not Family (Closer in Proximity)	**37%** (728)	**59%** (374)
Not Family (Unknown To Child)[2]	**37%** (723)	**--** (--)
Family (Extended Family)	**16%** (305)	**21%** (134)
Family (Nuclear Family)	**11%** (209)	**--** (--)
Mixed	**--** (--)	**20%** (125)
SEXUAL ACTIVITY		
1	**40%** (764)	**28%** (173)
2	**20%** (376)	**21%** (129)
3	**26%** (490)	**30%** (183)
4	**14%** (271)	**20%** (125)
	64 cases were coded as unclear	23 cases were coded as unclear
VICTIM AGE		
Infant/Toddler	**6%** (112)	**3%** (22)
Prepubescent	**33%** (644)	**31%** (196)
Pubescent	**61%** (1,209)	**42%** (264)
Mixed	**--**	**24%** (151)

[2] Unknown to child includes those some refer to as "strangers," sex traffickers, and missing data (see Appendix - Table 5).

Table 3 | **Modern Dataset Characteristics (continued)**

|	ONE ON ONE (N=1,965)	MULTIPLE RELATIONSHIPS (N=633)
VICTIM GENDER		
Female	**76%** (1,486)	**62%** (393)
Male	**24%** (479)	**22%** (141)
Mixed	-- (--)	**16%** (99)
OFFENDER GENDER		
Female	**2%** (41)	**3%** (17)
Male	**98%** (1,726)	**82%** (494)
Mixed	-- (--)	**15%** (87)
	198 observations missing	35 observations missing
ACTIVELY TRADED STATUS		
Not Traded	**93%** (1,822)	**88%** (558)
Traded	**7%** (143)	**12%** (75)

Modern Dataset: One Relationship

As noted in the sample selection section, NCMEC records information at both the case and individual level. Since key variables are coded at the case level, such as sexual activity, we chose to analyze the subset of cases with only one victim-offender relationship separately. These cases allow us to speak directly to the variables involved rather than providing grouped values or

generalizations about the case. The tables below show the distribution of the data (N=1,965). If any data is missing from the comparison, it is also noted in the table. Statistically significant odds ratios are reported beneath the tables. If the odds ratio is not presented, it can be assumed the difference was not statistically significant.

Figure 4 │ **One Relationship - Victim Gender by Actively Traded Status**

KEY

■ **Actively traded**
(Total 143)

■ **Not actively traded**
(Total 1,822)

(Total 1,965)

Female
(Total 1,486)
7.2% (107)
92.8% (1,379)

**Male** (Total 479)
7.5% (36)
92.5% (443)
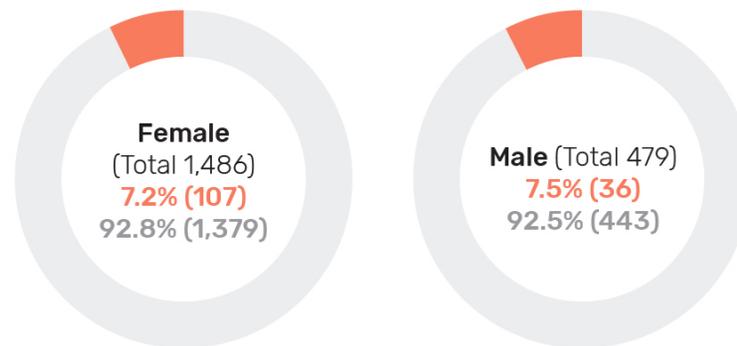
There was **no significant difference** in actively traded status based on victim gender.

Figure 5 | One Relationship - Victim Age by Actively Traded Status

KEY

■ **Actively traded**
(Total 143)

Not actively traded
(Total 1,822)

(Total 1,965)

Infant / Toddler
(Total 112)
8.9% (10)
91.1% (102)

Prepubescent
(Total 644)
15.8% (102)
84.2% (542)

Pubescent
(Total 1,209)
2.6% (31)
97.4% (1,178)
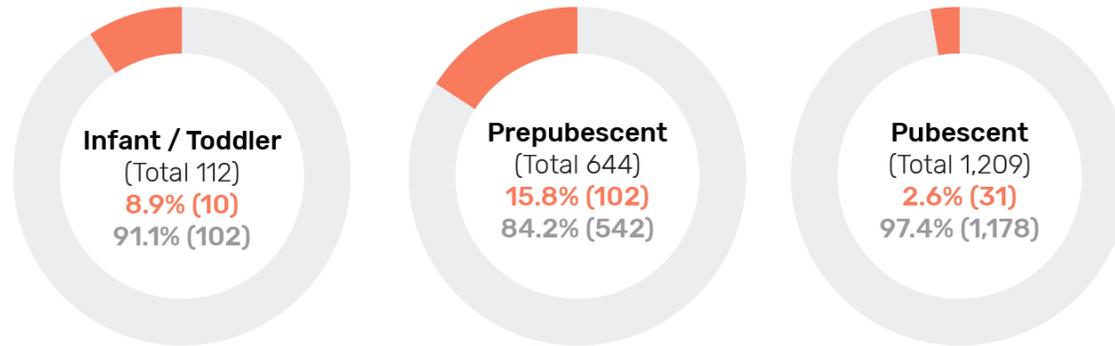
Cases with a **prepubescent victim were much more likely to be traded** than either infant/toddler or pubescent victims, suggesting this was the preferred age category.

Figure 6 | One Relationship - Offender Gender by Actively Traded Status

KEY

■ **Actively traded**
(Total 139)

Not actively traded
(Total 1,628)

(Total 1,767)
(Missing 198)

Female (Total 41)
4.9% (2)
95.1% (39)

Male (Total 1,726)
7.9% (137)
92.1% (1,589)
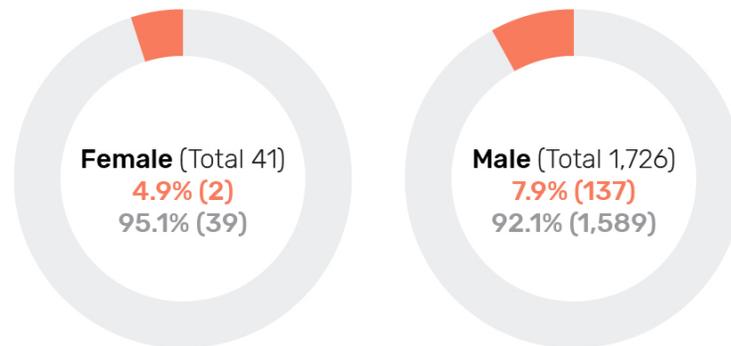
There was **no statistically significant difference** between male and female offenders.

Figure 7 | **One Relationship - Sexual Activity Scale by Actively Traded Status**

KEY

🟧 **Actively traded**
(Total 143)

⬜ **Not actively traded**
(Total 1,758)

(Total 1,901)
(Missing 64)
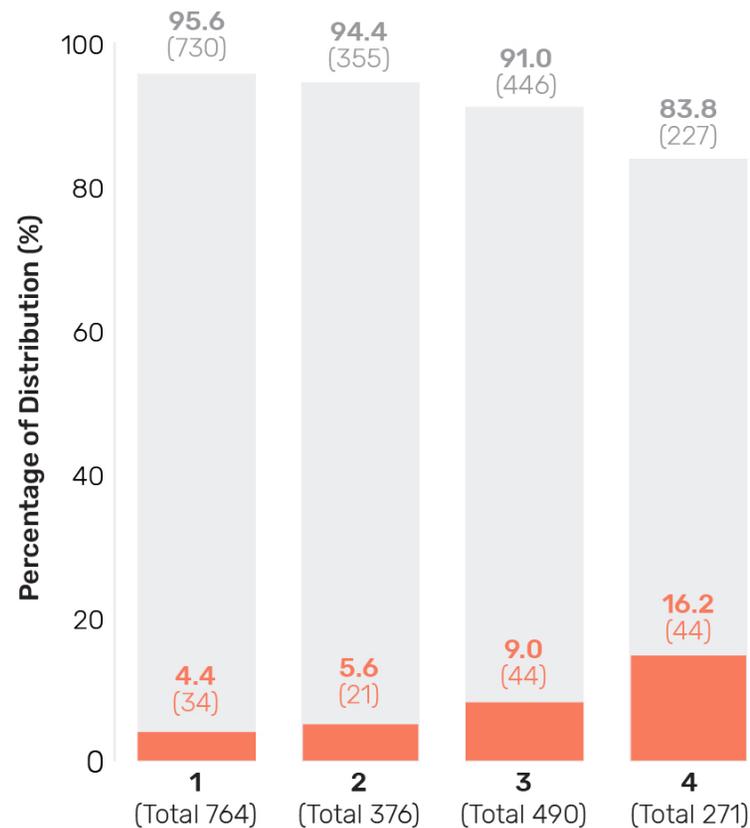
Each one point increase in the sexual activity scale was associated with a **greater likelihood of being actively traded**.

Figure 8 │ **One Relationship - Relationship by Actively Traded Status**

Percentage of Distribution (%)

KEY (NON-FAMILIAL)
- ■ Actively Traded
- □ Not Actively Traded

Non-Familial (Total 1,451)
6.1 (88) — 93.9 (1,363)

Close Proximity (Total 728)
8.7 (63) — 91.4 (665)

Unknown to the Child[3] (Total 723)
3.5 (25) — 96.5 (698)

KEY (FAMILIAL)
- ■ Actively Traded
- □ Not Actively Traded

Familial (Total 514)
10.7 (55) — 89.3 (459)

Extended Family (Total 305)
8.2 (25) — 91.8 (280)

Nuclear Family (Total 209)
14.4 (30) — 85.6 (179)
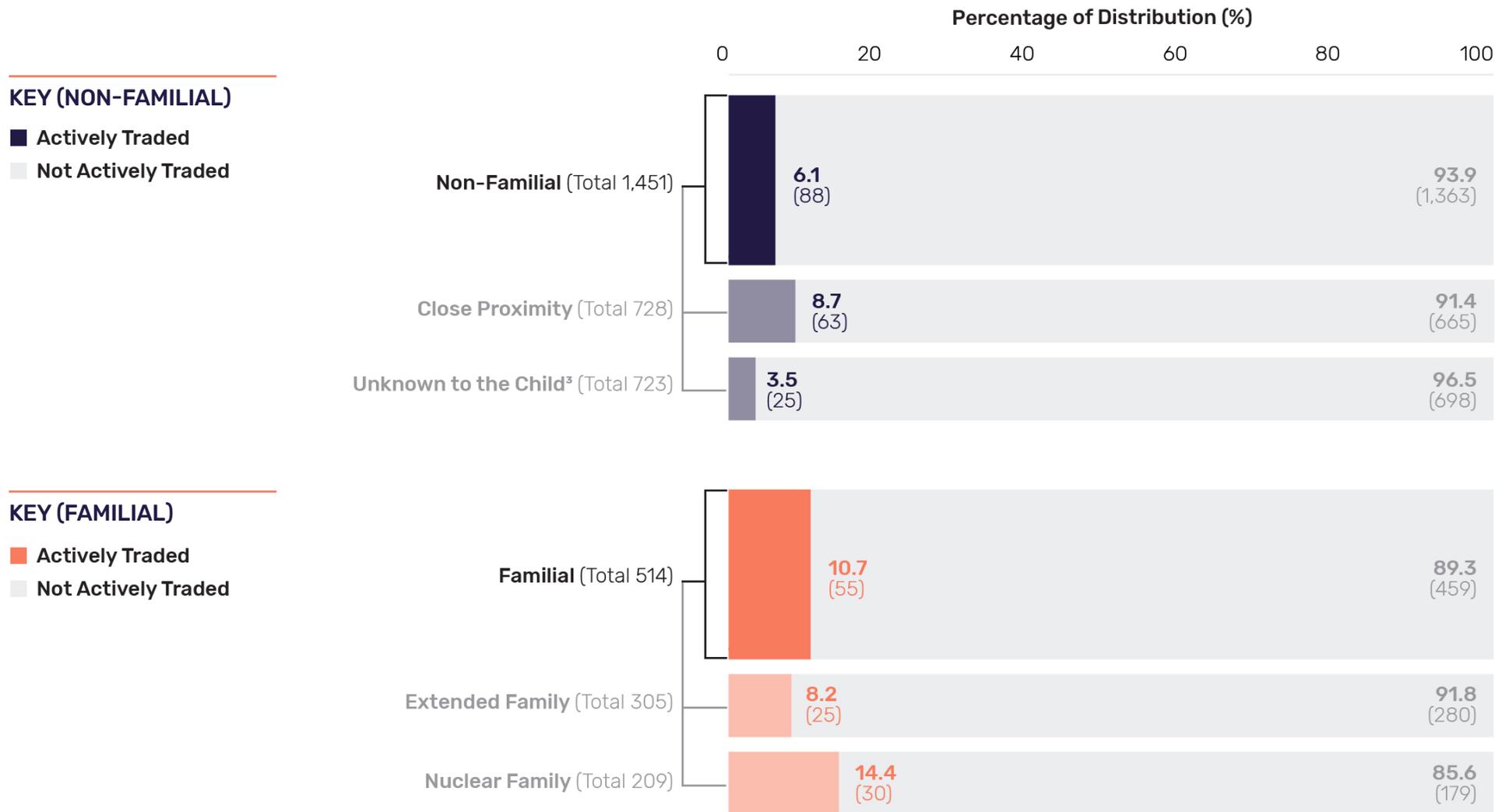
Cases with a familial relationship were more likely to be actively traded than cases with a non-familial relationship. Additional analysis revealed the difference was explained by cases involving nuclear family members being the most likely to be actively traded, and cases involving a person who is unknown to the victim or with whom the victim is unacquainted to be the least likely. Relationship coding is listed in Table 5 (Appendix).

[3] Unknown to child includes those some refer to as "strangers," sex traffickers, and missing data (see Appendix – Table 5).

Figure 9 | **One Relationship – Offender Gender by Relationship**

KEY

■ **Familial** (Total 512)

■ **Non-Familial** (Total 1,255)

(Total 1,767)
(Missing 198)

Female (Total 41)
61.0% (25)
39.0% (16)

Male (Total 1,726)
28.2% (487)
71.8% (1,239)
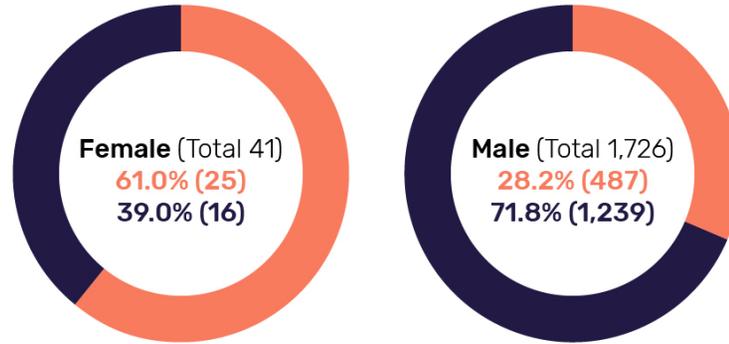
Though male offenders far outnumbered female offenders, **cases involving female offenders were much more likely to involve a familial relationship**.

Figure 10 | **One Relationship – Victim Gender by Relationship**

KEY

■ **Familial** (Total 514)

■ **Non-Familial** (Total 1,451)

(Total 1,965)

Female
(Total 1,486)
27.9% (415)
72.1% (1,071)

Male (Total 479)
20.7% (99)
79.3% (380)
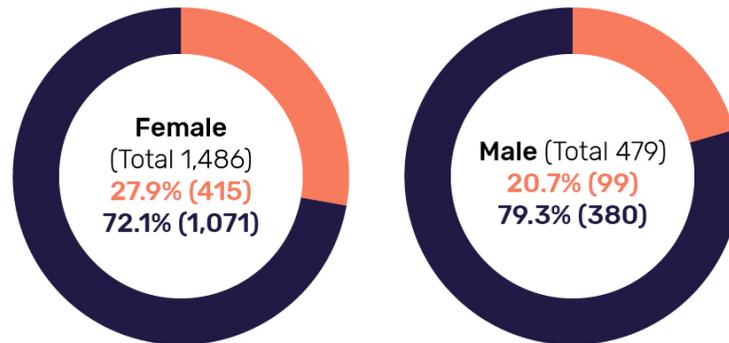
Cases involving female children were more likely to involve a familial relationship with the offender.

Figure 11 | **One Relationship – Victim Age by Relationship**

Pubescent
(Total 1,209)
14.4% (174)
85.6% (1,035)

Infant / Toddler
(Total 112)
58.9% (66)
41.1% (46)

Prepubescent
(Total 644)
42.6% (274)
57.4% (370)
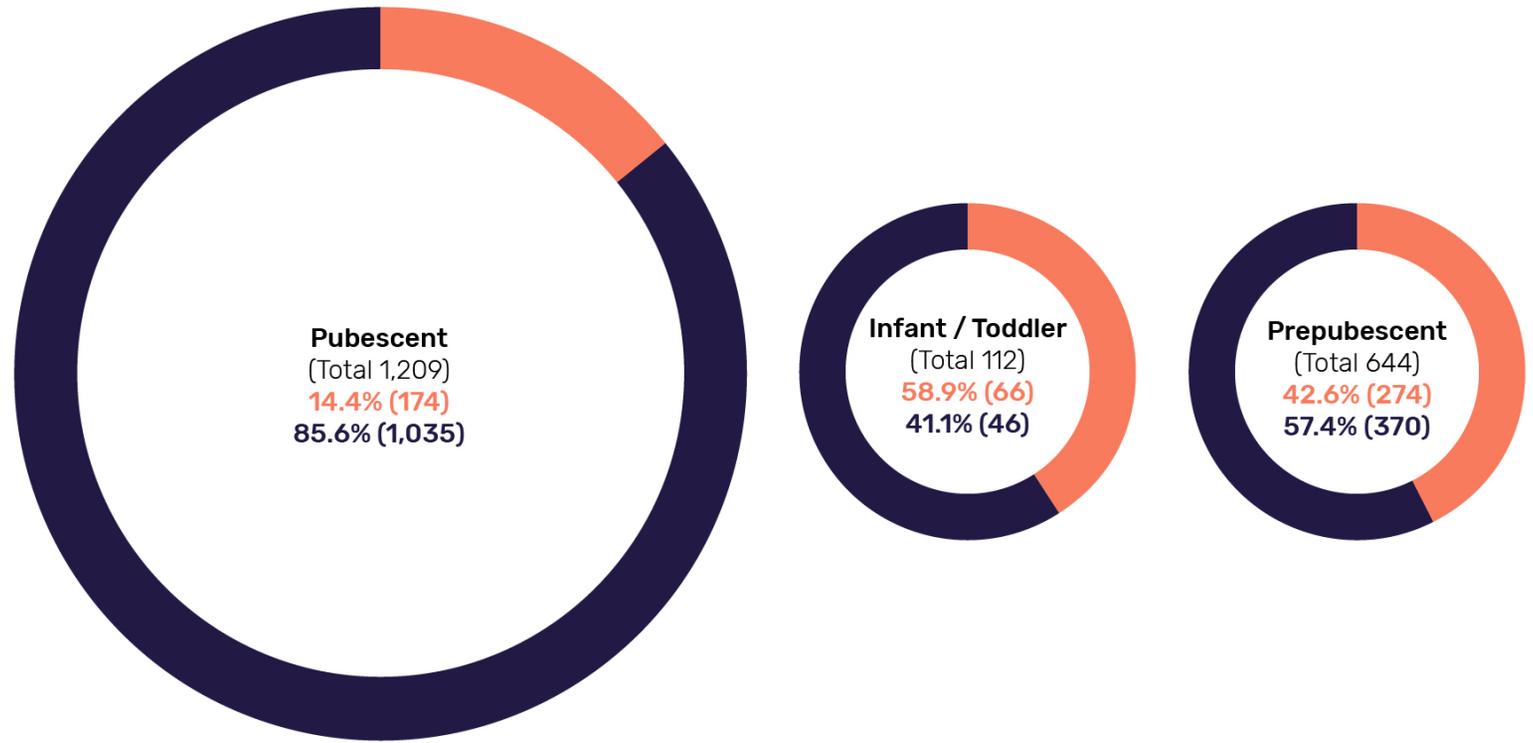
Cases involving pubescent victims were much less likely to involve a familial relationship (14% compared to 59% for infants/toddlers and 43% for prepubescent victims).

Figure 12 | **One Relationship – Sexual Activity Scale by Relationship**

KEY

■ **Familial** (Total 502)

■ **Non-Familial**
(Total 1,399)

(Total 1,901)
(Missing 64)

4 (Total 271)
40.6% (110)
59.4% (161)

1 (Total 764)
24.5% (187)
75.5% (577)

2 (Total 376)
23.7% (89)
76.3% (287)

3 (Total 490)
23.7% (116)
76.3% (374)
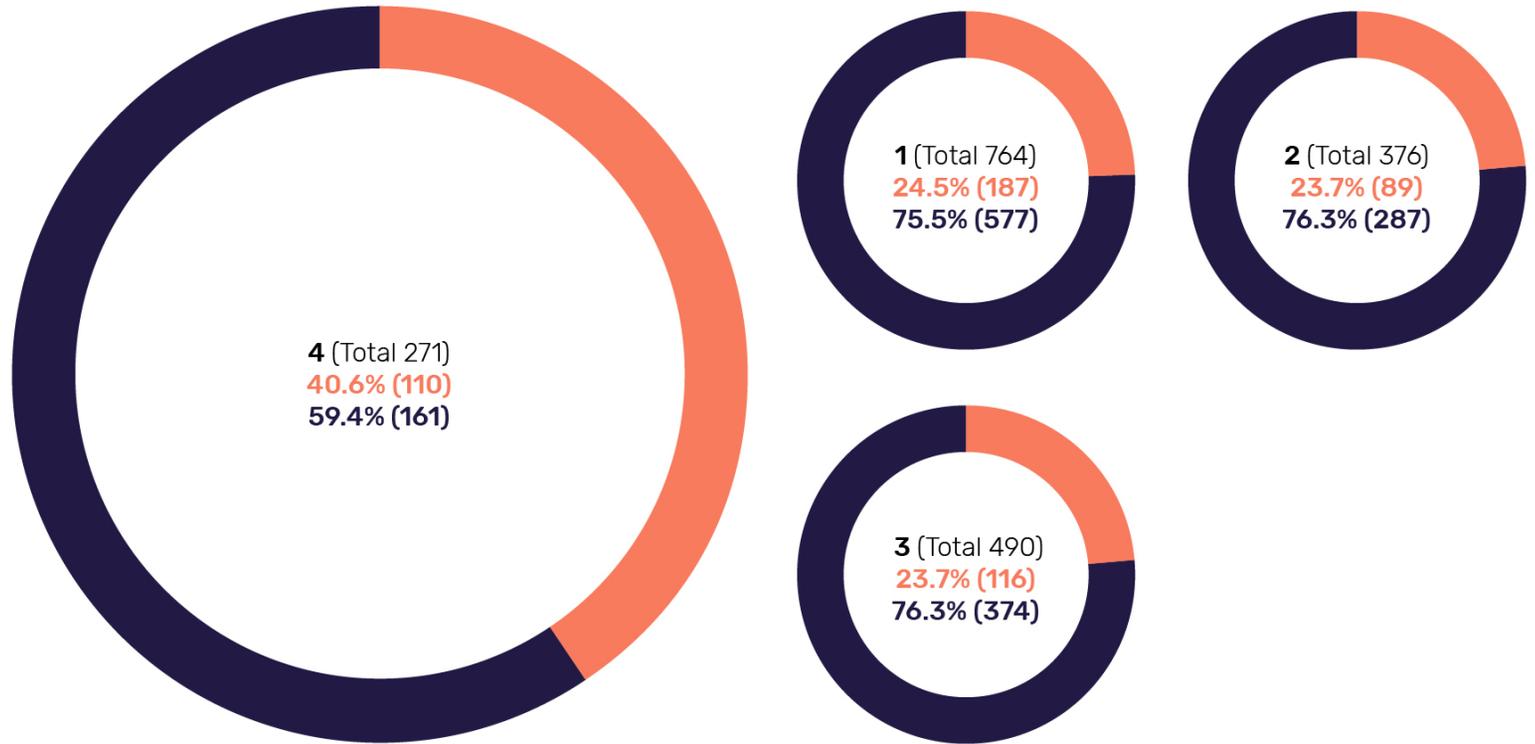
Cases involving the most egregious content
(level 4) were much **more likely to involve a
familial relationship** between offender
and victim.

Cases Involving Multiple Offender-Victim Relationships

The findings presented below included cases involving multiple offenders and/or multiple victims, unlike the one-to-one cases just described. To capture this, we added a "mixed" category: For example, if a case involved only female victims it would be marked "female only," if it involved only male victims it would be marked

"male only," and if the case included both male and female victims it would be marked "mixed." This has also been applied to victim age, offender gender, and relationships. The figures below show the distribution of the data (N=633). If any data are missing from the comparison, it is also noted in the figure.

Figure 13 │ **Multiple Relationships – Victim Gender by Actively Traded Status**

KEY

■ **Actively traded**
(Total 75)

■ **Not actively traded**
(Total 558)

(Total 633)

Female Only
(Total 393)
10.2% (40)
89.8% (353)

Male Only
(Total 141)
12.1% (17)
87.9% (124)

Mixed
(Total 99)
18.2% (18)
81.8% (81)
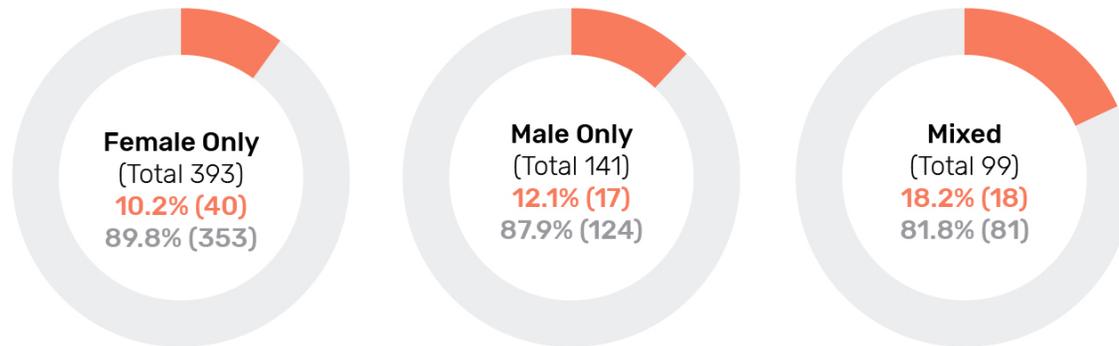
Cases with both **male and female victims ("mixed") were more likely to be actively traded**.

KEY INSIGHT

Infant/toddler only content was the **most likely** to be actively traded.

Figure 14 | **Multiple Relationships — Victim Age by Actively Traded Status**

Infant / Toddler Only (Total 22)
22.7% (5)
77.3% (17)

Prepubescent Only (Total 196)
19.9% (39)
80.1% (157)

Pubescent Only (Total 264)
2.6% (7)
97.4% (257)

Mixed Ages (Total 151)
15.9% (24)
84.1% (127)

■ **Actively traded** (Total 75)

■ **Not actively traded** (Total 558)

(Total 633)
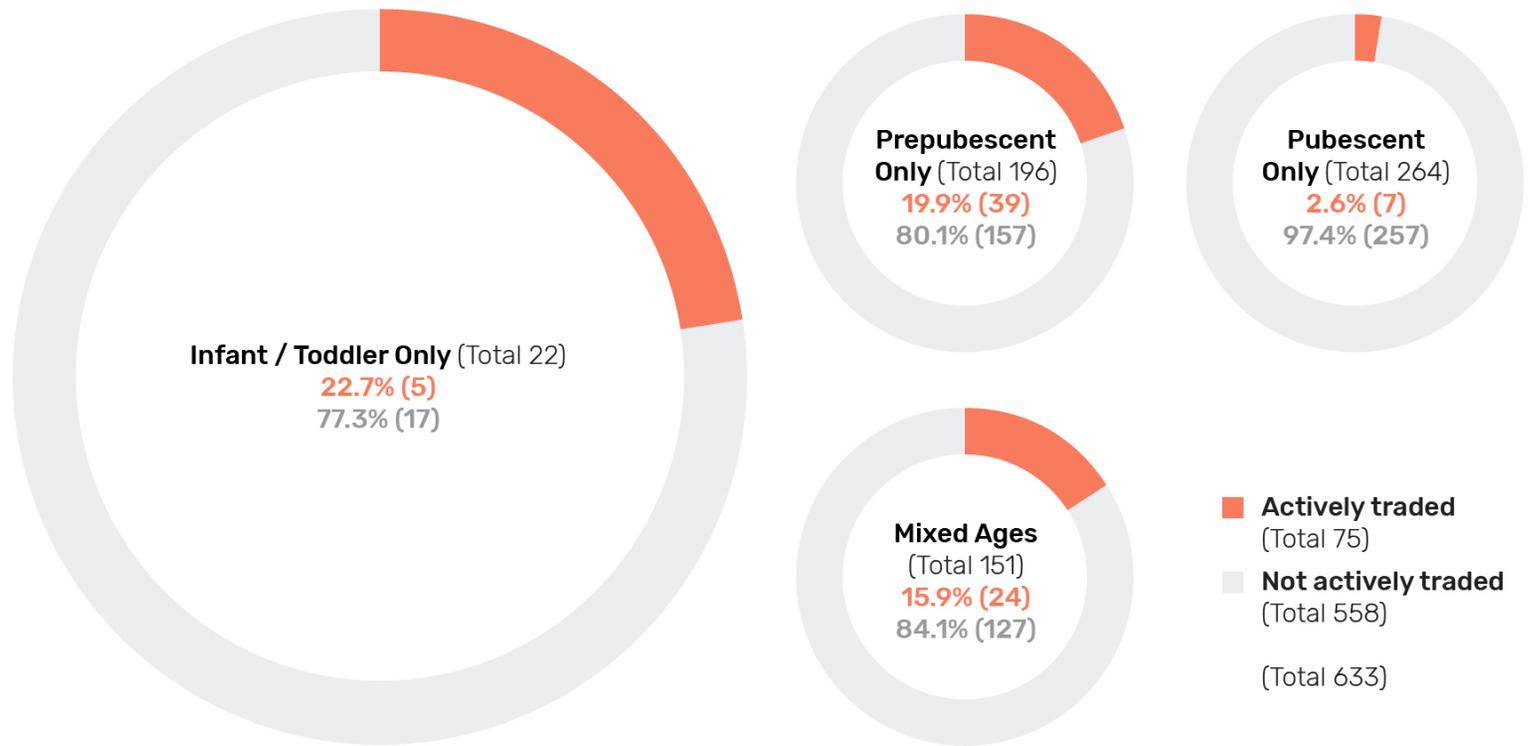
Unlike the one-to-one analysis, where cases involving prepubescent victims were the most likely to be actively traded, **infant/toddler content was the most likely to be actively traded in cases involving multiple offenders and/or victims**.

One possible explanation is that multiple relationship cases in which images were actively traded were more likely to involve a family member (see figure 17) than one-to-one cases and family members have more access to infants or toddlers.

Figure 15 | **Multiple Relationships – Sexual Activity Scale by Actively Traded Status**

KEY

■ **Actively Traded**
(Total 75)

■ **Not Actively Traded**
(Total 535)

(Total 610)
(Missing 23)

1 (Total 173)
5.2% (9)
94.8% (164)

2 (Total 129)
10.1% (13)
89.9% (116)

3 (Total 183)
15.8% (29)
84.2% (154)

4 (Total 125)
19.2% (24)
80.8% (101)
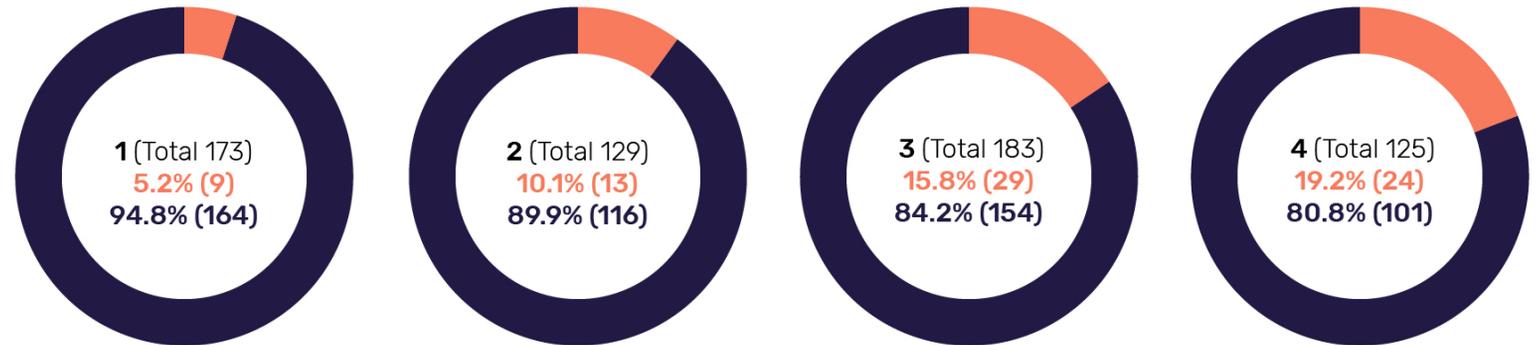
Again, the likelihood of being actively traded increased with sexual activity level.

Figure 16 | Multiple Relationships – Offender Gender by Actively Traded Status

KEY INSIGHT

Cases more likely to be actively traded:

- **male and female** offenders

- **familial only** relationships

Female Only
(Total 17)
0% (0)
100% (17)

Male Only
(Total 494)
11.9% (59)
88.1% (435)

Mixed (Total 87)
14.9% (13)
85.1% (74)

■ **Actively traded**
(Total 72)

Not actively traded
(Total 526)

(Total 598)
(Missing 35)
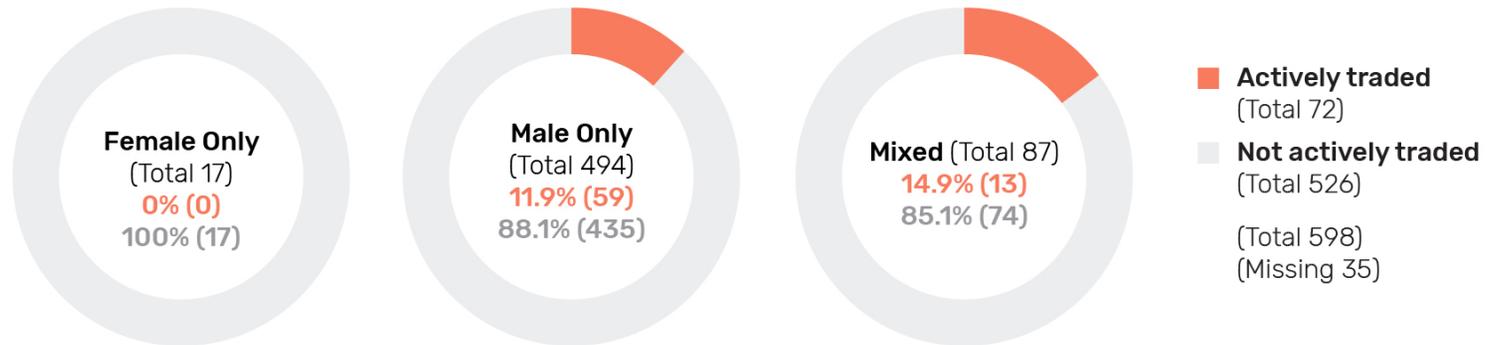
Cases involving both male and female offenders were **more likely** to involve actively traded content.

Figure 17 | Multiple Relationships – Relationships by Actively Traded Status

Familial Only
(Total 134)
18.7% (25)
81.3% (109)

Non-Familial Only (Total 374)
9.1% (34)
90.9% (340)

Mixed (Total 125)
12.8% (16)
87.2% (109)

■ **Actively traded**
(Total 75)

Not actively traded
(Total 558)

(Total 633)
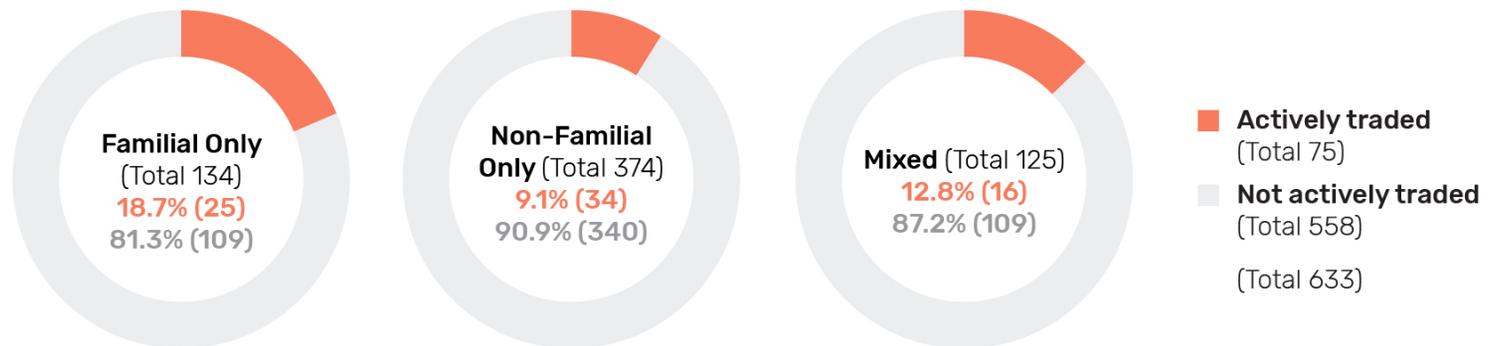
Again, cases involving **family offenders** were more likely to be actively traded.

Figure 18 | **Multiple Relationships – Offender Gender by Relationship**

KEY

■ **Familial** (Total 132)

■ **Non-Familial**
(Total 341)

□ **Mixed** (Total 125)

(Total 598)
(Missing 35)

Female Only
(Total 17)
- 41.2% (7)
- 29.4% (5)
- 29.4% (5)

Male Only
(Total 494)
- 19.8% (98)
- 65.2% (322)
- 15.0% (74)

Mixed
(Total 87)
- 31.0% (27)
- 16.1% (14)
- 52.9% (46)
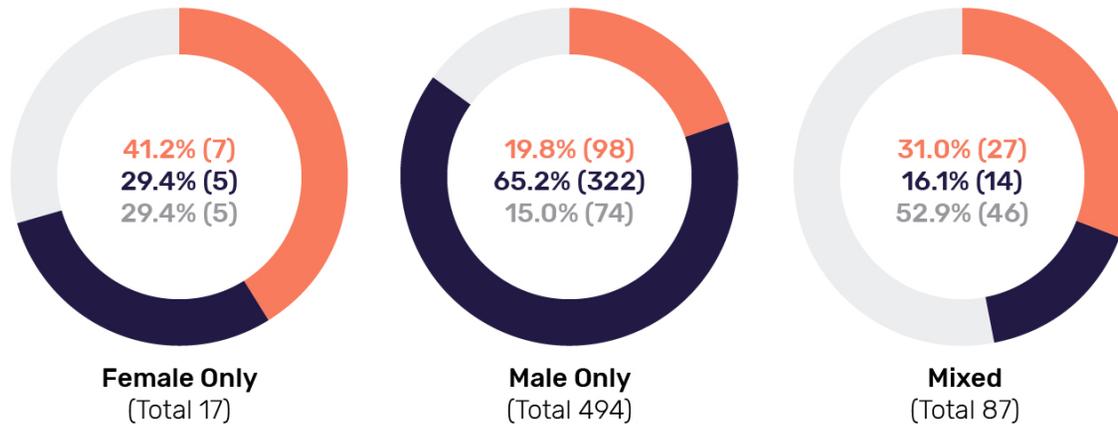
Figure 19 | **Multiple Relationships – Victim Gender by Relationship**

KEY

■ **Familial** (Total 134)

■ **Non-Familial**
(Total 374)

□ **Mixed** (Total 125)

(Total 633)

Female Only
(Total 393)
- 21.4% (84)
- 58.3% (229)
- 20.4% (80)

Male Only
(Total 141)
- 12.1% (17)
- 71.6% (101)
- 16.3% (23)

Mixed
(Total 99)
- 33.3% (33)
- 44.4% (44)
- 22.2% (22)
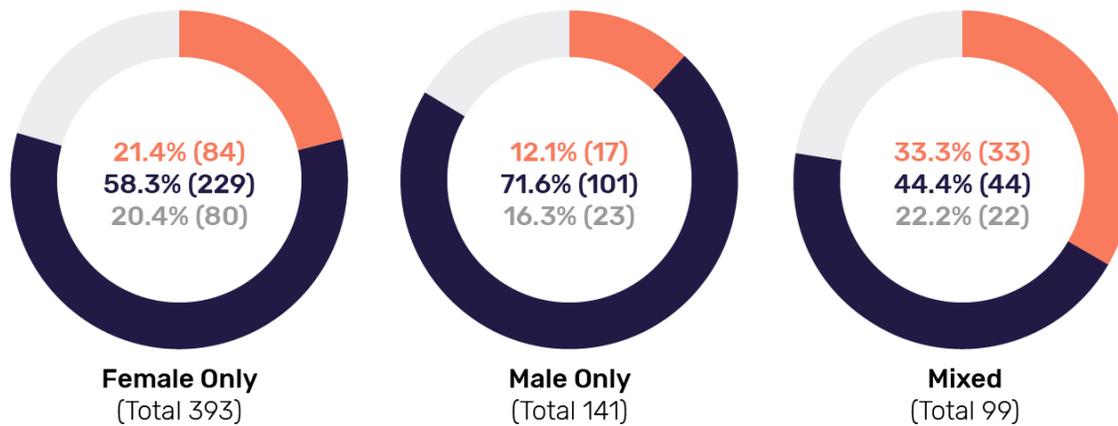
Figure 20 | **Multiple Relationships – Victim Age by Relationship**

KEY INSIGHT

Data shows there is a relative association between **pubescent victims and non-familial** offenders.

Infant/Toddler Only
(Total 22)

31.8% (7)
31.8% (7)
36.4% (8)

Prepubescent Only
(Total 196)

33.7% (66)
38.8% (76)
27.5% (54)

7.2% (19)
81.8% (216)
11.0% (29)

Mixed
(Total 151)

27.8% (42)
49.7% (75)
22.5% (34)

■ **Familial** (Total 134)
■ **Non-Familial**
(Total 374)
■ **Mixed** (Total 125)

(Total 633)

Pubescent Only
(Total 264)
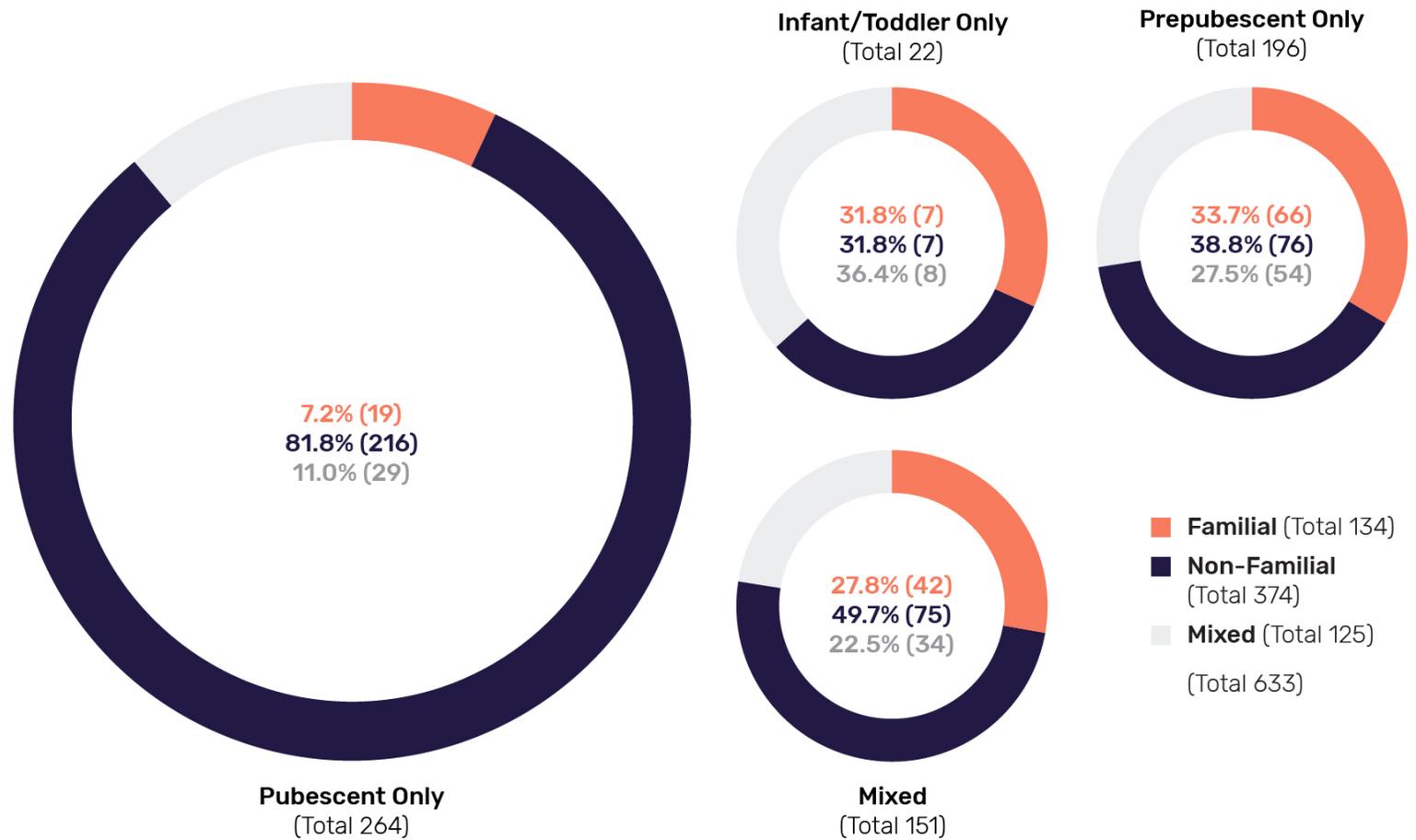
The most notable result here is **the relative association between pubescent victims and non-familial offenders**, paralleling the finding reported in Figure 11 (one relationship).

Figure 21 | **Multiple Relationships – Sexual Activity by Relationship**

KEY

■ **Familial** (Total 129)
■ **Non-Familial** (Total 358)
■ **Mixed** (Total 123)

(Total 610)
(Missing 23)

20.8% (36)
55.5% (96)
23.7% (41)

1 (Total 173)

15.5% (20)
67.4% (87)
17.7% (22)

2 (Total 129)

20.2% (37)
62.9% (115)
16.9% (31)

3 (Total 183)

28.8% (36)
48.0% (60)
23.2% (29)

4 (Total 125)
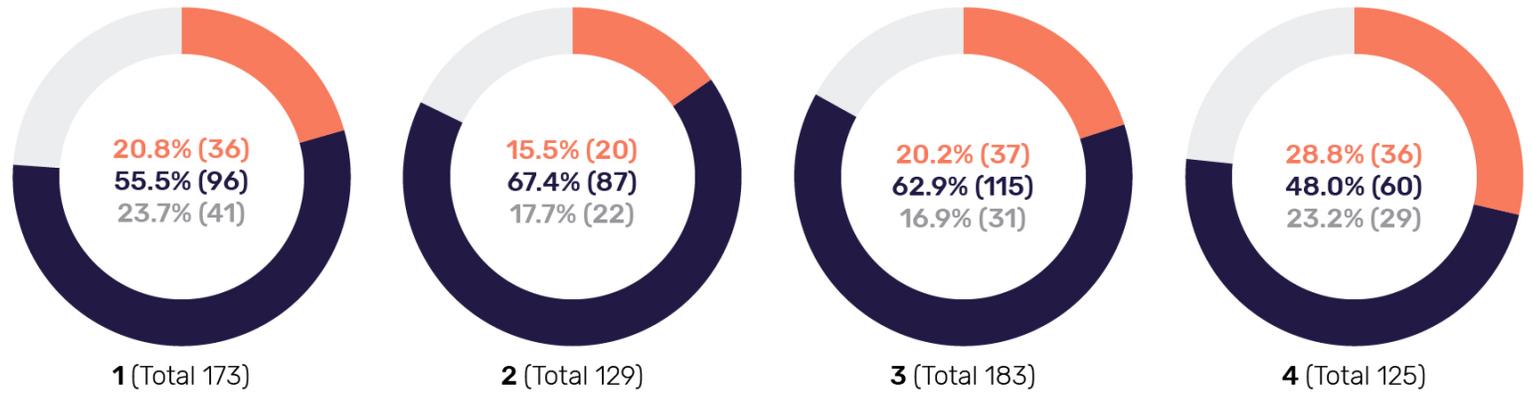
There was **no significant difference in each one point increase** in the sexual activity scale when comparing familial only to non-familial only, familial only to mixed, or non-familial only to mixed.

Figure 22 | **Multiple Relationships – Victim Age by Offender Gender**

KEY

■ **Female Only** (Total 17)

■ **Male Only** (Total 494)

■ **Mixed** (Total 87)

(Total 598)
(Missing 35)

9.1% (2)
50.0% (11)
40.9% (9)

3.3% (6)
73.5% (136)
23.2% (43)

1.2% (3)
89.7% (218)
9.1% (22)

4.0% (6)
87.2% (129)
8.8% (13)

Infant/Toddler Only
(Total 22)

Prepubescent Only
(Total 185)

Pubescent Only
(Total 243)

**Mixed**
(Total 148)
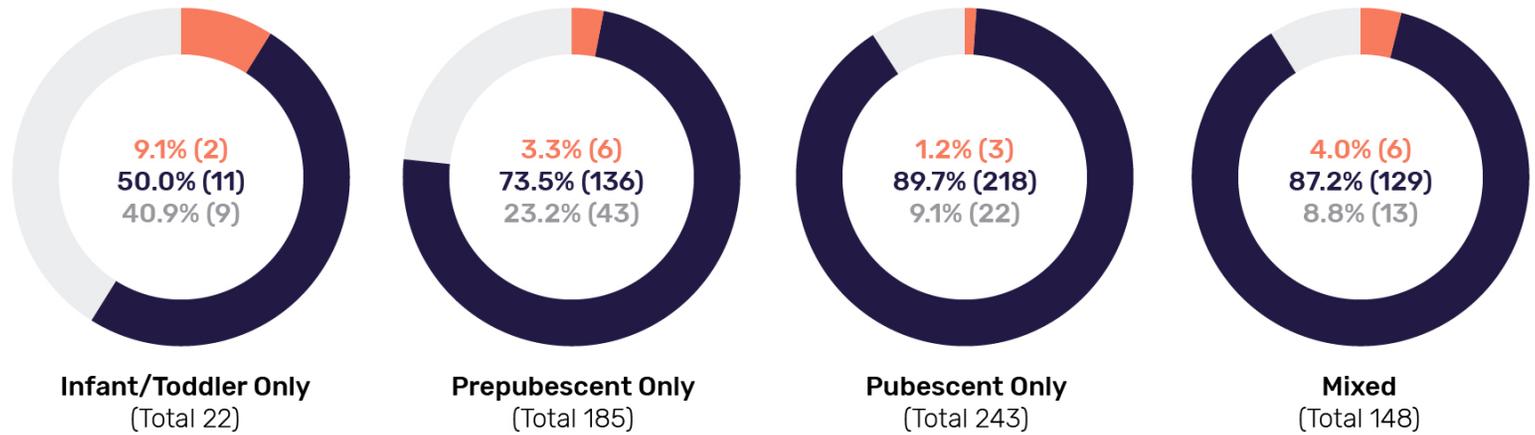
Most victims in all age groups were victimized by male offenders. However, **cases involving infant/toddler or prepubescent victims differed from other age groups by being more likely to involve both male and female offenders**.

Figure 23 | **Multiple Relationships – Victim Gender by Offender Gender**

KEY

■ **Female Offender Only**
(Total 17)

■ **Male Offender Only**
(Total 494)

■ **Mixed Gender Offender**
(Total 87)

(Total 598)
(Missing 35)

1.6% (6)
80.1% (298)
18.3% (68)

Female Victim Only
(Total 372)

1.5% (2)
91.7% (121)
6.8% (9)

Male Victim Only
(Total 132)

9.6% (9)
79.8% (75)
10.6% (10)

Mixed Gender Victims
(Total 94)
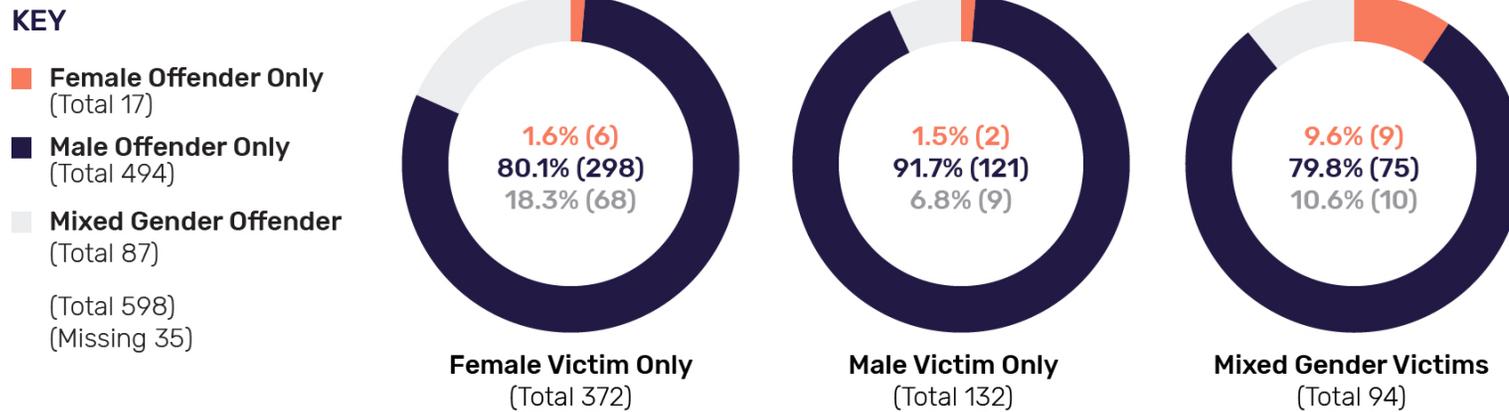
There was no obvious trend in the relationship between offender and victim gender. It was still the case that **most offenders in these cases were male (including mixed) and the majority of victims were female**.

Figure 24 | **Multiple Relationships – Sexual Activity by Offender Gender**

KEY

■ **Female Only** (Total 17)

■ **Male Only** (Total 479)

■ **Mixed** (Total 85)

(Total 581)
(Missing 52)

1.8% (3)
82.8% (135)
15.4% (25)

2.5% (3)
82.5% (99)
15.0% (18)

4% (7)
78.3% (137)
17.7% (31)

3.2% (4)
87.8% (108)
8.9% (11)

1 (Total 163)

2 (Total 120)

3 (Total 175)

4 (Total 123)
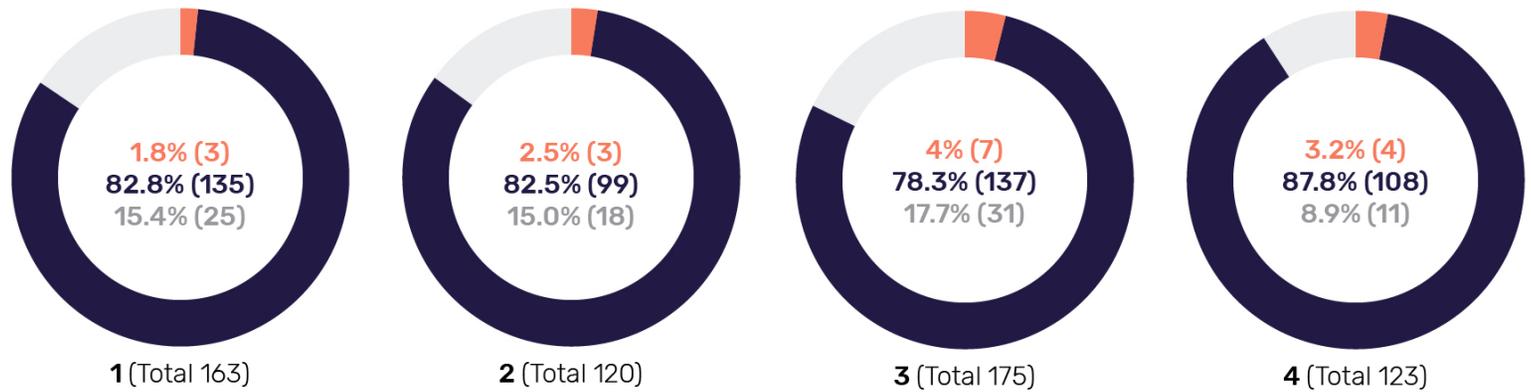
There was **no obvious trend** in terms of sexual activity level relative to offender gender.

KEY INSIGHT

Most notable historical finding: trend toward **more egregious** sexual content over time.

In the following, we first discuss the results from the historical dataset and then from the modern dataset, because the data were organized and examined differently. We then conclude with implications for policy and practice regarding law enforcement.

Historical Dataset

The historical dataset suggests there has indeed been a shift toward **more egregious content over time, with more content rated at levels 3 or 4 on the sexual activity scale in later years**. This is different from other analyses of child images, such as those reported by Wolak et al. (2011, 2012), but results are not directly comparable because we focused our analysis on cases involving adult producers and actively traded content.

The NCMEC data indicated variation but no obvious trend in the proportion of boy victims over time. Wolak, Finkelhor, and Mitchell (2011) reported a small decrease in boy victims between 2000 to 2006 (20% to 13%). With the INTERPOL database analysis, gender of the children varied over the years, with two-thirds (63%) involving girls. The only exception was in 2013, when boys were in the majority (Quayle, E., Jonsson, L., Cooper, K., Trayner, J. and Svedin, C-G., 2018). The Internet Watch Foundation (2013) data indicated 26% of identified images were boys in 2011, going down to 11% over the following two years.

Modern Dataset

Actively traded cases were associated with having prepubescent victims. **Actively traded cases were also associated with more egregious content in terms of sexual activity, and more likely to involve familial offenders, particularly nuclear family members**. A familial

KEY INSIGHT

Cases involving female offenders were **more likely** to also involve:

- male offenders,
- related victims,
- younger victims,
- and to be actively traded

offender-victim relationship was relevant in a number of other ways besides being more likely to be actively traded. Cases involving familial relationships were more likely to involve female offenders, female victims, more egregious content, and younger victims.

Male offenders were much more common than female offenders in this dataset, similar to previous research on online offending samples (see Babchishin, Hanson, & VanZuylen, 2015). Nonetheless, the involvement of female offenders was important when examining cases involving multiple offender-victim relationships. Cases involving female offenders were more likely to also involve male offenders, related victims, younger victims, and to be actively traded.

Integrating these different findings, the pattern of associations we observed indicates male offenders are the most common, as demonstrated in multiple prior studies. These male offenders are more likely to target girls who are unrelated to them, especially pubescent girls. However, there were also cases involving both male and female offenders. Different associations suggest these cases involve mostly unrelated male offenders co-offending with female offenders who were more likely to be related to victims, especially younger victims. These co-offending cases, denoted by mixed gender offenders, are more likely to have both boy

and girl victims.

Though we are aware of cases where unrelated male offenders contact women with custody of children in order to produce child pornography content that may then be distributed to others, this is largely an unexplored phenomenon in the scientific literature. These cases suggest female offenders are not explained by current models of online offending developed using research with male offenders. Case studies of female producers of child pornography suggest their criminal conduct is not related to pedophilia (Prat, Bertsch, Chudzik & Réveillère, 2014). Prat et al. hypothesized that producing images allowed women perpetrators to meet the desires or needs of their romantic partners, which was important enough to the women to overcome any inhibitions against exploiting children in their care.

This pattern of results can be interpreted in light of how we understand access and opportunity play a role in child sexual exploitation and abuse. Through social media and other online channels, men can have contact with pubescent children, particularly girls (Whittle, Hamilton-Giachritsis, Beech & Collings, 2013; Quayle, Allegro, Hutton, Sheath & Lööf, 2014; Winters, Kaylor & Jeglic, 2017). Some men who are interested in younger children, however, may contact and eventually conspire with women who have contact with younger children.

Implications for Law Enforcement

Images depicting younger children and/or more egregious content are **more likely** to involve **familial offenders** and were more likely to be **actively traded**.

Given limited law enforcement resources relative to the number of tips, reported contacts, and responses to personas, decisions have to be made about how to allocate time and effort. Decision-making algorithms would be helpful in this regard, and was the rationale for the development of the Child Pornography Offender Risk Tool (CPORT: Seto & Eke, 2015). However, producers of child exploitation content were a minority of the sample in the development of the CPORT, and there may be important differences between producers and possessors of this content.

Knowing more about those engaging in production of child exploitation images can serve to improve the efficiency of law enforcement operations. Knowing what type of images are most likely to be produced can help law enforcement plan their investigations accordingly. Using a large dataset, this study has replicated and extended previous research.

A significant finding is that prepubescent children are sought more than other age groups from this study's sample, and the finding that victim cases involving young children are more likely to involve at least one perpetrator related to the child and both male and female perpetrators. **Our findings also suggest images depicting younger children and/or more egregious content are more likely to involve familial offenders**. This information could be useful to law enforcement during victim identification efforts and investigations, perhaps keeping in mind that while looking for very young victims, the offender is relatively likely a family member.

Another finding relevant for law enforcement is not all images are traded with equal frequency. **Those with the most egregious content and those with a familial relationship between victim and perpetrator were more likely to be actively traded**.

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Appendix

Table 4 │ **4 Point Sexual Activity Scale**

1	Nudity or erotic posing with no sexual activity. (Level 1 on SAP Scale)

- Fully clothed erotica
- Erotica present
- Exposed genitals or anus
- Exposed breasts or chest
- Other sexual explicit content (i.e. fetishes)
- Full nudity

2	Non-penetrative sexual activity between children, adults and children, or masturbation. (Level 2+3 on SAP Scale)

- Licking
- Kissing
- Manual stimulation
- Oral copulation

3	Penetrative sexual activity between adults and children. (Level 4 on SAP Scale)

- Anal or vaginal penetration
- Ejaculation seen

4	Sadism or Bestiality (Level 5 on SAP Scale)

- Drugged / Sleeping
- Bestiality
- Bondage
- Defecation
- Urination

Table 5 | **Relationship Scale**

FAMILIAL	Nuclear Family	• Mother • Father • Brother • Sister • Half Sibling
	Extended Family	• Step-Father • Step-Mother • Aunt • Uncle • Grandfather • Step-Grandparent • Brother-in-Law • Cousin • Legal Guardian • Other Relative
NON-FAMILIAL	Close Proximity	• Babysitter/mentor/coach/teacher • Boyfriend • Guardian's Partner • Neighbor/Family Friend
	Unknown to Victim	• No Relationship • Online Enticement/Self & Perp Produced • Photographer • Sex Trafficker • Stranger • Unknown

Production and Active Trading of Child Sexual Exploitation Images Depicting Identified Victims