

*Part 4*

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*Multidimensional Scaling*



In order to establish whether relationships existed between the concepts identified in the data, two Multidimensional Scaling (MDS) procedures were employed: Smallest Space Analysis (SSA) and Multidimensional Scalogram Analysis (MSA). These techniques have been previously applied to data obtained from police records and were chosen on the basis of the similarity of such data to that presented here<sup>12</sup>. Their use in this context allows the representation of non-metric relationships between relatively large numbers of variables across minimal dimensions, and compares these in a visually accessible manner.

Smallest Space Analysis is a technique used to represent correlations between variables in a statistically derived geometric space (Lundrigan, 2001). For dichotomous crime data, in which each variable under consideration is identified as either present or not present in relation to a specific offence, correlations are most commonly achieved using Jaccards Correlation Coefficient. Jaccards Correlation Coefficient is particularly useful in this context because it does test for "joint non-occurrence" of variables. As such, if two variables are both absent in a data set, their concurrent lack of representation does not result in an increased association between them.

Given that data collected by law enforcement agencies are often limited to the "observable", the lack of measurement of a particular variable in a particular case cannot be taken to mean that the variable was not present. Rather, it simply means that it was not observed. For instance, in the cases of those Internet censorship offenders who deleted their collections of objectionable material prior to investigation, lack of evidence regarding the collection of images portraying female children does not mean that selection of images portraying female children were not part of the offence behaviour. For non-dichotomous data, in which variables are ranked according to whether offenders demonstrated low, medium or high levels of a particular attribute (such as collection size, hours on the Internet or cost of equipment involved in the offence), Pearson's Product Moment Correlation coefficient is used.

Smallest Space Analysis of data results in a series of points plotted on a two or three-dimensional axis. Each of these points represents a variable. The proximity of points measures the strength of the relationships between the variables they represent, with points plotted close together having a stronger association than those plotted further apart. For instance, if most offenders who were found to collect images of female children were also found to collect images of bestiality, the points representing each of these variables would be plotted close together. In turn, if few of those collecting images of female children also collected images of male children, these points would be located further apart. SSA is particularly useful in exploratory analyses as it produces a solution of smallest dimensionality on the basis of the rank order of correlations rather than their absolute values. As such, it relates variables on the basis of *levels* of association rather than *degrees* of association.

A Coefficient of Alienation (C of A) accompanies each Smallest Space Analysis plot. The Coefficient of Alienation indicates the fit between the geometric representation portrayed in the SSA plot and the original correlation matrix from which the associations between the points on the plot are derived. A

<sup>12</sup> Canter, D., and Heritage, R. (1990). A multivariate model of sexual offence behaviour: developments in offender profiling. I. *Journal of forensic psychiatry*, 1: 185-212.

Coefficient of Alienation can range from zero to one, with zero representing a perfect fit and coefficients of less than 0.25 indicating a good fit.

The points represented on an SSA plot are commonly analysed according to Facet Theory<sup>13</sup> (Lundrigan, 2001). Facet theory was originally developed, as a means of organising qualitative datasets so that they could be systematically analysed for the purpose of generating and testing hypotheses. As such, it implies formal definition of research data into mutually exclusive concepts, comprised of mutually exclusive elements, which can be used to define the constituents of a research domain.

In this research, facet theory was applied to the development of the profiling checklist. As such, each category (facet) identified in relation to the offence behaviours was designed to be mutually exclusive from every other category, and each category was made up of a number of variables (elements) that were mutually exclusive of each other, and of the variables making up other categories<sup>14</sup>. For instance, an offender could be found to be selecting material that was classified under sections 3(2)(a) and 3(2)(f) of the Classification Act. However, the mere fact that they were selecting material from one of these categories did not logically influence the likelihood that they were selecting material from the other. Neither did the fact that an offender was selecting material portraying the variable "female children" logically influence the likelihood that s/he was also selecting material portraying "male children" (hence, inclusion of the "both males and females" option). Similarly, selecting material portraying male children being exploited for sexual purposes did not logically influence the likelihood of an offender also selecting material portraying male children being tortured or subjected to cruelty. In terms of non-dichotomous or continuous variables, the likelihood that an offender spent a high number of hours on the Internet during the week prior to investigation did not logically influence whether s/he was found to be in possession of a high number of objectionable images or high cost computer equipment.

Use of facet theory in the analysis of SSA plots is similar to its use in the development of data collection methods. As such, facets (categories) and their elements (variables) are identified as being mutually exclusive from each other and any observed association between them is said to reflect interactions between the data and some external agent (Borg and Groenen, 1997<sup>15</sup>). By identifying elements that are associated during the SSA procedure, new facets may be identified for exploration and hypothesis generation during future research efforts. The employment of SSA to generate new facets for future analysis and hypothesis testing is referred to as exploratory SSA, whilst the use of SSA to test hypotheses that arise from this process is referred to as confirmatory SSA. However, implicit in all such analyses is the hypothesis that the data under consideration can be classified according to commonalities between the agents that influence it. Taylor (1999) suggested that differences between the types of objectionable images that individuals collect indicate important differences between the offenders themselves. The hypothesis implicit within the current research states that interaction between the elements of the

<sup>13</sup> For further explanation of Facet Theory see Borg, I. (1981). *Multidimensional Data Representations: when and why*. London: Mathesis Press.

<sup>14</sup> In some cases the questions provided on the checklist did not imply exclusivity (such as where inspectors were only asked to choose one of a number of options). However, this was done to ease checklist completion and the responses to these questions were recoded prior to analysis.

<sup>15</sup> Borg, I., and Groenen, P. (1997) *Modern multidimensional scaling: theory and applications*. Springer-Verlag Inc, New York.

images selected by censorship offenders (such as the age, ethnicity, gender of the subject and the activity depicted) will differ according to the personal preferences of these individuals. The selection of variables for SSA analysis was made on the basis of these elements.

This hypothesis assumes that individuals select images that show the elements they prefer. Acknowledging this assumption, however, it was further anticipated that differences in personal preferences could be related to important aspects of offender behaviour. In order to identify differences between the preferences and behaviours of individual offenders a multidimensional scalogram analysis was employed.

As indicated earlier, the purpose of SSA analysis is to identify relationships between the variables. In order to test whether individual offenders could be distinguished according to these relationships a Multidimensional Scalogram Analysis (MSA) procedure must be applied to the data. MSA is based on the same theory as SSA but focuses on the associations between offenders as opposed to the associations between offence variables. As such, it conveys the conceptual space between offenders as determined by a selection of offence variables. Where the resulting plots show offenders located together, the analysis suggests that they share many offence variables in common.

In order to establish exactly which combinations of variables which offenders share, each MSA plot is supported by several underlying subplots, which locate offenders on a variable by variable basis. By overlaying these offender-variable plots onto the global MSA plot, any patterns observed in terms of offender and variable distribution suggest specific patterns of offender behaviour.

Clearly, in terms of the criminal context being able to discriminate between offenders on the basis of specific preferences and behaviours has greater functional value than merely being able to discriminate between the variables themselves. However, by undertaking initial SSA analysis, one is able to gain a better understanding of what combinations of variables might be used to distinguish between offenders.

### ***Interpreting Smallest Space Analysis Plots***

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Just as questionnaire or checklist categories may be divided into those that relate to dichotomous variables demonstrating distinct preferences and continuous variables demonstrating transitional distinctions in behaviour, so too may the facets identified during SSA analysis. In the SSA plots shown in this report, three main types of facet are used to divide or partition the data points. These are:

- polarising facets – shown as lines separating the plotted points into distinct or opposing regions like cutting a cake
- axial facets – shown as partitioning lines cutting the space into dimensional subspaces like lines on a road
- modulating facets – shown as frequency contours portraying transitional distinctions between the points displayed within the plot.

Within this context, facet theory states that centrally located points tend to represent variables with the highest associative relationships to all other variables. These variables are considered significant in defining the entire “universe of observations” or area under study. In contrast, points located on the periphery of SSA plots tend to represent variables of significant value in differentiating between the various regions of the plot. Because the SSA configuration is derived from the associations between the variables, any emergent frequency structure represents an empirical finding with substantive meaning.

## *Smallest Space Analysis of Offender Selection of Objectionable Material*

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### **Section 3(2)(a) of the Classification Act**

Most of the offenders were identified as selecting material found to be objectionable under section 3(2)(a) of the Classification Act (portraying the sexual exploitation of children and young people), and many offenders were not found to possess any other type of material. Therefore, analysis of the elements that comprised material of this nature was identified as a logical starting point for gaining an understanding of general offender preferences.

All of the variables identified as describing the material classified under Section 3(2)(a) were subjected to Smallest Space Analysis (e.g. age, gender, ethnicity, and location of individuals portrayed in the material, as well as the types of activities engaged in by these individuals). Table 4.1 provides details of variables included in this analysis, and percentage of offenders associated with each. The numbers preceding each of the labels listed in this table correspond to the number of the variable listed on the plot in Figure 4.1.

Only the data from those offenders who were found to select images classified under Section 3(2)(a) of the Act, and which included details of the material selected, were included in this analysis (N=96). In addition, some variables were recoded to facilitate effective comparison across elements. Specifically, data regarding images portraying both male and female children were counted under each of the “male” and “female” categories, and the “both males and females” category was discarded<sup>16</sup>.

Also, due to the low number of offenders found to select material portraying children with non-adult and non-child others, this variable was excluded from the analysis. Conversely, as all of the offenders were found to select material showing Caucasian children or young people, this variable was also excluded.

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<sup>16</sup> Recoding the gender variables also allowed for greater independence between them, such that selection of material portraying “males” did not preclude selection of material portraying “females”. Variable independence is a fundamental assumption of Smallest Space Analysis.

**Table 4.1:**

Label	Image included pictures of	Percentage
1. Females	Female children and young people	81
2. Males	Male children and young people	39
3. Hispanic	Hispanic children or young people	14
4. African	African children or young people	6
5. Asian	Asian children or young people	29
6. Alone	Children or young people shown on their own	68
7. With child	Children or young people shown with other children or young people	88
8. With adults	Children or young people shown with adults	91
9. Babies	Babies aged under 2 years	8
10. Young child	Children aged 2-7 years	51
11. Old child	Children aged 8-12 years	89
12. Teenagers	Teenagers aged 13-16 years	45
13. Naturalist	Naturalist type nudity or partial nudity	49
14. No genitals	Posed nudity without the display of genitals	52
15. Genitals	Posed nudity with the display of genitals	77
16. Explicit sex	Explicitly sexual acts	94
17. Harm	Harmful acts (eg. those involving weapons, torture instruments and bondage)	7
18. Fear	Children or young people demonstrating physical and/or verbal expression of fear or distress	7
19. Incest	Incest or implied incest	27
20. Degrading	Degrading/dehumanising activities (eg extreme close-ups, use of body as inanimate object)	10
21. Commercial	Commercial environments	20
22. Masked	Masked environments	15
23. School	School environments	11

The two dimensional solution shown in Figure 4.1 yielded a Guttman-Lingoes' Coefficient of Alienation equal to 0.207730, with 27 iterations (Figure 4.1).

**Figure 4.1: {Refer to appendix at the end of this section}**

Figure 4.1 shows an axial facet dividing the variables into three distinct subspaces. These subspaces correspond to:

Subspace 1. Erotica and “non-violent” sexual material (naturalist images, images showing posed nude children with and without the display of genitals, and images of “non-violent” sexual interaction involving children, images of children on their own, commercially produced “glamour” pictures of children)

Subspace 2. Material focusing on specific types of children (i.e. males, Asian, teenagers, African, Hispanic, babies, incest, masked environment, school, young children)

Subspace 3. Material portraying activities that are violent and/or degrading in nature (harm, fear, degrading).

The dense cluster of variables located in the first subspace is indicative of the finding that most offenders selected material including these elements. However, the fact that this cluster is significantly removed from the variables identified in subspace three suggests very little overlap between the collection of “general” images of the sexual exploitation of children and young people and “violent and degrading” images of the sexual exploitation of children and young people.

Axial facets are usually interpreted as representing ordering across dimensions (Borg and Groenen, 1997). As such, Figure 4.1 may suggest a continuum ranging from offender interest in general (non-violent) images through to violent and degrading images, that is mediated by an interest in specific types of individuals. The fact that material portraying incest was located in the second subspace is consistent with the fact that incest specifically focuses on the type of person portrayed (as a relative). Similarly, identification of an environment as a school implies specific roles and types of dress. Of note, is the relatively close association between images portraying incest and those portraying males.

Certainly, the way in which the variables spread out across the SSA plot, from those identified for most offenders to those identified for very few suggests a transition from images that portray general scenes (domestic, public, involving children with adults and other children), to those that portray specific subject preferences, through to those that imply an extreme power differential between the individuals shown. Furthermore, the fact that masked environments are associated with the second subspace and transition phase suggests that as the activities and people portrayed in the images become more specific, the environment in which it is portrayed assumes less importance.

Of significance in terms of the results presented in Figure 5 are the empty spaces in the visual plot; most notably between subspace 2 and subspace 3 and to the left of subspace 1. The gap between variables specifically associated with the sexualisation of children and those associated with violence and degradation, suggests that other variables may be needed to define the relationship between the two types of offending. Given the emotive nature of the latter, such variables may include other forms of emotional expression or inference portrayed in the images.

## *Other Sections of the Classification Act*

In response to the results shown in Figure 4.1, an additional SSA analysis was undertaken to test whether the material selected by those who did not limit their offending to section 3(2)(a) of the Act could also be distinguished according to themes that transcended the sections of the Act itself. As such, it was expected that the elements of the images identified in relation to these individuals would group together in a similar way to the elements shown in Figure 4.1; with clear distinction between person specific images, images showing violent and degrading acts, and images showing non-violent deviant acts.

To compare these themes across all of the sections of the Act, specific variables were identified from each section as indicative of violent and degrading acts, non-violent acts, or person specific characteristics, and entered into the analysis. The variables identified as indicative of violent and degrading acts are described in Table 4.2(a). The numbers preceding each of the labels listed in this table correspond to the number of the variable listed on the plot in Figure 4.2. Similarly, the letter preceding each label corresponds to the section under 3(2) of the Classification Act from which the variable was derived.

**Table 4.2(a):**

Label	Description (Material identified under...)	Percentage
7.(a) Harm	Section 3(2)(a) involving explicitly harmful acts or actions	10
8.(a) Fear	Section 3(2)(a) involving the physical expression of fear or distress	10
10.(a) Degrading	Section 3(2)(a) involving degrading or dehumanising acts or actions	14
13.(b) Harm	Section 3(2)(b) involving explicitly harmful acts or actions	14
14.(b) Rape	Section 3(2)(b) involving rape or forced sexual activities	31
15.(b) Fear	Section 3(2)(b) involving the physical expression of fear or distress	14
17.(b) Degrading	Section 3(2)(b) involving degrading or dehumanising acts or actions	14
18.(d) Urine	Section 3(2)(d) as involving the use of urine or excrement	64
22.(f) Torture	Section 3(2)(f) as involving acts of torture or the infliction of extreme violence or extreme cruelty	33

Table 4.2(b) provides details of those variables identified as representative of non-violent acts.

**Table 4.2(b):**

Label	Description (Material identified under...)	Percentage
3.(a) Natural	Section 3(2)(a) involving naturalist type nudity or partial nudity	36
4.(a) No genital	Section 3(2)(a) involving posed nudity without the display of genitals	31
5.(a) Genital	Section 3(2)(a) involving posed nudity with the display of genitals	55
6.(a) Child	Section 3(2)(a) involving explicitly sexual acts or actions	81
9.(a) Incest	Section 3(2)(a) involving incest or implied incest	38
16.(b) Incest	Section 3(2)(b) involving incest or implied incest	12
21.(e) Bestial	Section 3(2)(e) as involving bestiality	76

Gender was identified as the person specific variable because it was the only such variable that was consistently collected across all of the sections of the Act (with the exception of section 3(2)(e) for which no person specific variables were collected). As in the previous analysis, the gender variables were recoded so that data regarding images portraying both male and female children were counted under each of the "male" and "female" categories, and the "both males and females" category was discarded. Details of the labels of the relevant gender variables are provided in Table 4.2(c).

**Table 4.2(C):**

Label	Description	Percentage
1.(a) Girls	Images identified under Section 3(2)(a) involving female children	86
2.(a) Boys	Images identified under Section 3(2)(a) involving male children	36
11.(b) Females	Images identified under Section 3(2)(b) involving females	33
12.(b) Males	Images identified under Section 3(2)(b) involving males	14
19.(d) Females	Images identified under Section 3(2)(d) involving females	64
20.(d) Males	Images identified under Section 3(2)(e) involving males	12
23.(f) Females	Images identified under Section 3(2)(f) involving females	29
24.(f) Males	Images identified under Section 3(2)(f) involving males	7

In this analysis only the data from those offenders who were found to select material classified under section 3(2)(b), section 3(2)(d), section 3(2)(e) or section 3(2)(f) of the Act were included. However, where these individuals were found to select material classified under section 3(2)(a) as well, the data regarding this material were also analysed. Cases where data regarding the elements of the material were missing were discarded. Due to the small number of individuals who traded and/or possessed images classified under section 3(2)(c) of the Act, data regarding this offence category were also discarded. In total, the data from 42 offenders were subjected to SSA.

Dichotomous data lists were generated for each offender on the basis of whether or not images traded or possessed by them contained any of the variables listed in Tables 4.2(a), 4.2(b) and 4.2(c). These lists

were analysed for correlation using Jaccards co-efficient of association and the resulting association matrix was subjected to the SSA procedure. The three dimensional solution yielded a Guttman-Lingoes' Coefficient of Alienation equal to 0.156700, with 23 iterations. Figure 4.2 shows the three-dimensional spatial projection for the resulting configuration. Each point relates to a single variable and the closer any two points are, the more likely the variables were found to co-occur in images.

As shown in Figure 4.2, those variables pertaining to the portrayal of violent and degrading acts and activities (as defined by the variables of harm, degradation, fear, rape and torture) are clearly distinguished from those pertaining to the portrayal of non-violent acts and activities (such as bestiality, child sex, and posed nudity with and without the display of genitals). Furthermore, given the absence of related gender variables, the strong association between images identified under section 3(2)(a) that portray harmful acts and those identified under section 3(2)(b) that portray harmful acts suggests that the violent theme is definitely the defining characteristic of this selection.

These findings are in line with the results displayed in Figure 4.1. Furthermore, although the variables specifying females as the subjects of the selected objectionable material tended to be closely aligned with variables indicating the Section from which the gender specific identification originated<sup>17</sup>, this pattern did not hold for variables indicating male subject selection. Moreover, all of the male subject variables were located in the region of the plot pertaining to violent and degrading activities. The area was also home to variables indicating the portrayal of incest or implied incest. Having said this, incest portrayed in images classified under section 3(2)(a) of the Act was found to be relatively polarised from incest portrayed in images classified under section 3(2)(b) of the Act, and much more closely aligned with variables portraying non-violent activities.

As in Figure 4.1, Figure 4.2 was also marked by gaps in the distribution of variables across the SSA plot. Most notably, a large space was evident in the mid upper part of the plot between variables portraying non-violent acts and those portraying degrading variables. Once again, this gap suggests that additional variables may be needed to fully explain the relationship between these regions. Of note, however, is that variables concerning the use of urine and defecation in relation to dehumanising, degrading and sexual activities was not associated with other variables indicating degrading and dehumanising activities. This finding suggests qualitative differences between the activities involved. Also worth attention is the fact that variables pertaining to bestiality and urination and defecation were very strongly associated with variables indicating female subjects.

Furthermore, despite the fact that most of the offenders identified in the sample used to generate Figure 4.2 had selected material classified under section 3(2)(a), and that most of this material portrayed explicitly sexual exploitation of children and young people, the variables associated with such activity were not located at the centre of the plot. As such, the analysis suggests that selection of material that could be classified according to section 3(2)(a) was not solely focused on the sexualisation of children. Rather, it related to the sexualisation of children within the context of other activities.

<sup>17</sup> For example, section 3(2)(f) female classification strongly associated with section 3(2)(f) torture classification, section 3(2)(d) female classification strongly associated with section 3(2)(d) urination and defecation classification, section 3(2)(a) female classification strongly associated with section 3(2)(a) child sex classification, and section 3(2)(b) female classification strongly associated with section 3(2)(b) rape classification.

Figure 4.2: {Refer to appendix at the end of this section}

## *Multidimensional Scalogram Analysis of Offender Selection of Objectionable Material*

In order to test whether the selection of objectionable material made by individual offenders could be distinguished according to the themes identified in Figures 4.1 and 4.2, an MSA analysis was undertaken using variables indicative of each of the three main preference groups identified in the SSA analysis. These variables were chosen from those identified in Tables 4.2(a), 4.2(b) and 4.2(c) as portraying violent acts, non-violent acts and person specificity. An attempt was made to choose variables from across all of the sections classified under the Classification Act. At the same time, variable choice was also influenced by the strength of the associations between them, as identified on the SSA plot. Furthermore, because of the large number of offenders identified as selecting material that was objectionable under section 3(2)(a) of the Act, only those variables demonstrating lower level frequencies were included in the analysis. However, to test whether individual selection patterns differed within section 3(2)(a), more variables from this section were included than from the other sections. Table 4.3 Provides details of the variables selected.

Table 4.3:

Preference	Variables
Type	
Violence	Portrayal of harmful acts in images classified under section 3(2)(a) and 3(2)(b) of the Act and portrayal of torture and cruelty in images classified under section 3(2)(f) of the Act.
Non violent deviance	Portrayal of urination and defecation activities in images classified under section 3(2)(d) of the Act, Portrayal of bestiality in images classified under section 3(2)(e) of the Act, portrayal of naturalist type nudity in images classified under section 3(2)(a) of the Act.
Person focused	Portrayal of males in images classified under section 3(2)(a), section 3(2)(b) and section 3(2)(d) of the Act.

A two dimensional analysis procedure yielded a coefficient of contiguity of 0.943370 The results of this analysis are shown in Figure 4.3.

The analysis included the data from all offenders who were identified as selecting material showing at least one of these variables (78 offenders, also excluding those for which no details of the objectionable material under investigation was provided). Each offender was given an identification number for use during analysis. Where several offenders demonstrated the exact same pattern of offending, only the number and data from the first offender demonstrating the pattern were retained. In total, the data from 50 offenders were removed from the analysis due to duplication of results. Each of the numbers displayed on Figure 4.3 relates to an offender or group of offenders.

Although complex, Figure 4.3 demonstrates a clear distinction between those offenders who were found to trade and or possess images portraying harmful acts involving children (to the right of the far red vertical line), and those who traded or possessed naturalist type images of children (to the left of the blue semi vertical line). Bearing in mind that all of these individuals were investigated in relation to sexual images of children (in addition to the images identified in this plot), this finding suggests that interest in such material differs between offenders. All of the offenders who were conceptually located within the space pertaining to the selection of material classified under section 3(2)(a) as portraying harmful actions were also found to select material portraying torture and extreme cruelty classified under section 3(2)(f) of the Act (all of the area to the right of the dark green vertical line). Selection of torture and cruelty material also subsumed all of those who were found to select material classified under section 3(2)(b) of the Act that portrayed harmful acts (all of the area to the right of the bright green semi vertical line).

Offenders who selected material portraying males (all of the area above the violet horizontal line) were almost equally as likely to select naturalist type material as they were to select material showing harmful acts. Given that many more offenders were identified in relation to the trade or possession of naturalist type images than the trade or possession of images portraying harmful acts, however, this finding appears significant. Furthermore, the bulk of offenders found to select material portraying naturalist type nudity did not portray males, whereas more than half of those identified in relation to material showing harmful acts or torture did.

In contrast, very few of those who selected material portraying bestiality (all of those below the horizontal magenta dotted line) or urination and defecation (all of those to the right of diagonal dotted yellow line) were also found to select images of males. However, many of these did select material showing harmful acts. This finding appears to contrast the results of the SSA analysis. However, it is of note that offenders trading bestiality images were also frequently found to select naturalist type material. As such, the results infer that offender based associations between material portraying urination and defecation and non-violent objectionable material may be mediated by an interest in bestiality and a specific interest in the portrayal of females. Given the descriptive statistics discussed earlier, it is assumed that this interest would also involve images of female children engaged in sexually explicit activities. Therefore, this variable appears to provide a bridge between non-violent and violent material. This conclusion is in line with the description of material identified under section 3(2)(d) of the Act as involving the use of urination and defecation in relation to sexual or degrading activities.

Also of note is the fact that offenders who demonstrated an interest in material classified under section 3(2)(d) of the Act that portrayed males were distributed throughout the plot with not obvious pattern to their apparent interest. Furthermore, the distribution of those individuals who demonstrated an interest in bestiality and urination and defecation images was generally less consistent (e.g. these individuals were more likely to be associated with others who did not show an interest in such images), than the distribution of individuals identified in relation to other variables.

**Figure 4.3: {Refer to appendix at the end of this section}**

## *Smallest Space Analysis of Variables related to Risk of Re-Offence or Offence in Another Area*

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Although it is interesting that different offenders show different preferences in terms of the types of objectionable material that they trade and/or possess, this finding is of little investigative importance unless it can be tied to differences in other offence activities. Within the context of law enforcement, an issue of significant concern is the likelihood that an offender will re-offend or go on to commit other crimes.

Following on from the analysis undertaken thus far, it was hypothesised that different types of offender preferences may be related to the likelihood that individuals will re-offend or offend in another manner. However, before any such relationships could be examined it was necessary to identify variables that could be used to measure these risk factors.

Given that most of the material selected by the censorship offenders pertained to the visual depiction of sexual offences (especially the sexualisation of children), and that prior sexual offending is known to be statistically associated with an increased risk of future sexual offending (Nagin and Farrington, 1992; Nagin and Paternoster, 1991; Sampson and Laub, 1993), variables pertaining to prior convictions for a sexual offence (including investigations and warnings) were identified as a primary indicator of risk. In the same vein, prior convictions for the trade and/or possession of objectionable material were viewed as a primary indicator of risk for future convictions in this area. Research into the development of criminal offending has also shown that criminal offending is associated with interaction in and support from criminal relationships and networks (Sampson and Laub, 1993). Therefore, this factor was also considered as indicative of risk.

While it would be simple to say that those individuals who demonstrate any of these risk factors are at risk of future offending, most researchers agree that conviction rates form only part of the picture. When it comes to criminal offending of a sexual nature many more offenders are not reported or convicted than the number that are (McDonald, 2002). Therefore, an SSA analysis was undertaken to identify what other variables are associated with these factors. This analysis was undertaken in the hope of identifying specific trends in offender behaviour that might be associated with an increased risk of re-offence or offending in another area. Selection of the other variables included in this analysis was made on the basis of whether they suggested motivation or opportunity (including capability) to commit further crimes or offend in another area.<sup>18</sup>

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<sup>18</sup> For further discussion of the importance of these constructs see Wikstrom, P.H., Clarke, R.V., and McCord, J. (1995). Integrating crime prevention strategies: Propensity and opportunity. National Council for Crime Prevention, Sweden.

## *Opportunity Indicators*

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Given that most of the offenders were found to trade and/or possess images portraying the sexualisation of children, opportunity to obtain legitimate one on one access to children was considered worth including (described in Table 4.4 as professional access to children, voluntary access to children or caregivers, responsibility as sole caregiver of children). Similarly, the opportunities provided by social isolation and time to engage in the trade of objectionable material were also identified as notable (described in Table 4.4 as living alone). Finally, high level of offender capability was identified in terms of specific security applied to the objectionable material, portable storage methods (concealable), high estimated level of computer literacy, and interpersonal means of accessing the material (described in Table 4.4 as ICQ and email).

## *Motivation Indicators*

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In terms of motivation, variables suggesting a high level of offender involvement in the subject of the objectionable material were considered important. These were identified in terms of the collection of material that could not be defined as objectionable but was considered suspicious within the context of the offending, large collections, well indexed collections, the production and distribution of objectionable material, high levels of time engaged with the mode of offending, the collection of other objectionable material (apart from that under investigation) and the possession of 'unusual' objectionable material (material with very specific subject matter that is difficult to find). More information on this type of material is contained in the descriptive statistics section of this publication (Part 3). Also of note was whether the offender paid the same attention to other aspects of his/her environment. For this reason excessively untidy living conditions were also noted.

Dichotomous data lists were generated for each offender on the basis of whether or not images traded or possessed by them contained any of the variables listed in table 4.3. These lists were analysed for correlation using Jaccards Co-efficient of Association and the resulting association matrix was subjected to the SSA procedure. The three dimensional solution yielded a Guttman-Lingoes' Coefficient of Alienation equal to 0.199460, with 16 iterations. Figure 4.4 shows the three-dimensional spatial projection for the resulting configuration. Each point relates to a single variable and the closer any two points are, the more likely the variables were found to co-occur in images.

**Table 4.4:**

Variable Label	Variable Description	Percentage
1. CCU offence	Prior conviction for a censorship offence	3
2. Sexcrime	Prior conviction for a sexual offence	14
3. Work-child	Professional contact with children	15
4. Sole-caregiver	Frequently sole-caregiver of children	8
5. Other-accp	Voluntary contact with children	15
6. Unusual	Unusual collection of objectionable material - highly specific themes or characteristics	17
7. Nob_chn	Collection of legally non-objectionable images of children	16
8. Nob_porn	Collection of legally non-objectionable pornography	29
9. Nob_Other	Collection of legally non-objectionable "other" material	12
10. Messy	Lives in excessively unkempt conditions	33
11. Large-coll	Large collection of objectionable material	14
12. Production	Involved in the production or distribution of objectionable material	46
13. Organised	Well organised or indexed collection of objectionable material	10
14. Wide range	Wide range of objectionable material	8
15. Sells	Sells objectionable material	8
16. CCU-associated	Associates with known censorship offenders	3
17. Illegal-as	Associates with individuals identified as being involved in other illegal activities	19
18. Alone	Lives alone	33
19. High-liter	High level of computer literacy	14
20. >30 hours	Spent more than 30 hours on the Internet during the week prior to conviction	20
21. ICQ	Obtains objectionable images using ICQ	28
22. Email	Obtains objectionable material using Email	27
23. Floppy	Stores objectionable material on floppy disk	16
24. Zip-CD	Stores objectionable material using a Zip-drive or CD-Rom	5
25. Hardcopy	Prints objectionable material into hard copy	5
26. Password	Password protects objectionable material files	8
27. Encrypted	Encrypts objectionable material files	6
28. High cost	Estimated cost of computer equipment over \$3,000	21

The spread of the variables across the plot presented in Figure 4.4 suggests an axial facet presenting three distinct subspaces. To the lower left are variables associated with prior censorship compliance offences (Subspace 1). These include: possession of objectionable material in hard copy, possession of “unusual” or highly specific objectionable material; possession of material showing children that could not be defined as objectionable, but was considered suspicious within the context of the censorship offending; other (non professional) access to children; sole caregiver of children; and possession of other material that did not specifically show children or sexual acts, but was considered suspicious within the context of the censorship offending (such as posed images of older females, images of the offenders own dog, numerous images of a specific media character). Of particular note is the close association between the collection of non-objectionable images of children and voluntary access to children. Furthermore, although these variables are located in the region pertaining to prior censorship offending, they are also relatively closely associated with the variable pertaining to prior sexual offences. Given the axial nature of the facets portrayed on the plot, this relationship may represent a link in the continuum from censorship offending to sexual offending. However, clearly, the separation of the two offence variables suggests that they represent different origins of interest.

The variable pertaining to prior sexual crimes is located in the middle region of the plot (Subspace 2). It is very near the variable representing large collections, which, together with well organised collections, appears to be central to most of the other variables displayed on the plot. Prior sexual offending is most closely associated with variables pertaining to offenders living alone and in unkempt conditions, and being in possession of costly computer equipment. Of note is that professional involvement with children is also located in this region, as is the use of encrypted computer security measures. However, the latter appears to be more closely associated with prior censorship offences than with prior sexual offences.

Significantly removed from the rest of the variables, in the upper right hand corner of the plot are the variables pertaining to offenders associating with other censorship offenders and offenders associating with other individuals identified as having committed other crimes (Subspace 3). The separation of these variables from the rest of the plot suggests that such involvement is related to a completely different set of behaviours than repeat censorship offending or sexual offending. As such, associating with censorship offenders and other individuals involved in illegal activity appears to be motivated by a different interest orientation than that which compels censorship and sexual offending. The fact that these variables were not at all associated with large collections of objectionable material, but fell within the same region as high levels of time spent using the Internet, suggests that this interest may be of a more social nature. Similarly, the observation that this region was also home to variables pertaining to the possession of a wide range of images, and was closely associated with the production and distribution of objectionable material, implies a much more interactive involvement with images serving primarily as the means for exchange.

**Figure 4.4:** {Refer to appendix at the end of this section}

## *Multidimensional Scalogram Analysis of Offenders by Variables related to Risk of Re-Offence or Offence in Another Area*

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In order to test whether the patterns identified in Figure 4.4 could be identified in the behaviour of specific offenders, an MSA analysis of those variables most closely associated with prior censorship offending, prior sexual offending and associations with known censorship offenders. A two dimensional analysis procedure yielded a coefficient of contiguity of 0.942310. The results of this analysis are shown in Figure 4.5. The analysis included the data from all offenders who were identified as with any of the variables listed below:

- previous censorship offence
- previous sexual offence
- other (non-professional) access to children (eg. as scout leaders, teacher aide volunteers, and holiday camp workers)
- objectionable images identified as being “unusual” (including highly specific subject matter, series, and supplementary written material)
- offender found in possession of images of children that could not be described as objectionable but were considered suspicious within the context of the offence
- offender’s living conditions described as excessively unkempt
- offender lives alone
- objectionable material saved to hard copy
- associates with other censorship offenders
- computer equipment valued over \$3,000.00.

In total, 78 offenders were identified and each of these was given an identification number for use during analysis. Where several offenders demonstrated the exact same pattern of offending, only the number and data from the first offender demonstrating the pattern were retained. This process resulted in the data from 56 offenders being discarded due to duplication of results.

The results of this analysis demonstrated that offenders with previous censorship convictions were relatively well distributed across the plot, as were offenders who were living alone, living in excessively unkempt conditions, and in possession of computer equipment valued over \$3,000.00. However, specific groupings were identified for those who were found in the possession of highly specific or “unusual” objectionable material (right of the diagonal orange line), and those that had previously been investigated and/or convicted in relation to a sexual crime (left of the diagonal green line). These groups of individuals were clearly separated from each other. Furthermore, another group of offenders was specifically identified as associating with other censorship offenders (left of the violet diagonal line). Although this group included some individuals who had committed sexual crimes and some who collected highly specific or unusual objectionable material, it remained relatively distinct from these two other groupings.

Interestingly, more individuals identified as selecting highly specific or unusual objectionable material were found to have regular, non-professional access to children (to the right of the red diagonal line) than individuals identified as having been investigated in relation to a sexual offence. In contrast, individuals identified as having been investigated in relation to a sexual offence were more likely to possess objectionable material printed in hard copy (to the right of the blue diagonal line) and to collect images of children that could not be defined as objectionable but were considered suspicious within the context of the offending (to the right of the mauve diagonal line).

Considering these results, it appears that for some offenders the collection of highly specific or unusual objectionable material (including the attachment of supplementary written material) is the primary purpose of their censorship offending, and as such forms the focus for their activities. For others, however, censorship offending is merely part of a much wider interest in criminal offending, particularly that which involves children. The fact that these individuals are more likely to print out the material that they collect and to collect complementary non-objectionable material, suggests that their offence materials may be used to support sexual fantasy generation and development. In contrast, it is of note that those who were identified as collecting highly specific or unusual objectionable material either associated with other censorship offenders or maintained access to children. This finding suggests that the relationships themselves have a functional purpose to the offence activities.

Figure 4.5: {Refer to appendix at the end of this section}

## *Multidimensional Scalogram Analysis of Offenders by Risk and Selection Variables*

An MSA analysis was undertaken to test whether the objectionable material selected by those who demonstrate specific risk factors is comparable with those who do not. Given the strong association between the variables identified as indicating a preference for “violent and degrading” objectionable material in Figure 4.2, it was decided to compress all of the “violence and degradation” variables identified in Table 4.2(a) into a single variable (“Violent”). Reliability analysis across the eight “violence and degradation” variables identified in Table 4.2(a) yielded a Chronbachs alpha of 0.7965. In response to the distinctions between variables identified as pertaining to bestiality and urination and defecation, and those pertaining to naturalist type nudity that were identified in Figure 4.2, it was decided to separate these variables in the current analysis. As such, naturalist type nudity was paired with posed nudity without display of genitals (“Nudity”, Chronbachs alpha = 0.8347), and urination and defecation was paired with bestiality (Chronbachs alpha = 0.7896). Because of the high incidence of images portraying explicitly sexual involvement with children and posed nudity with display of genitals, these two variables were excluded from the MSA analysis. Similarly, comparison of the “male” variables identified in Table 4.2(c) did not achieve significance when tested for reliability across categories (Chronbachs alpha = 0.3957). Therefore, person specific variables were also excluded from the analysis.

In terms of specific risk factors, those most closely associated with previous conviction for a sexual crime (offenders possessing large collections of objectionable material, possessing well organised collections of objectionable material, having regular non-professional access to children, possessing

collections of non-objectionable images of children, living in excessively unkempt conditions, and living alone) were subjected to reliability analysis (Chronbachs alpha = 0.9980) and compressed into a single variable ("Sexcrime"). As none of the other primary risk factors (prior censorship offence, associates with known censorship offenders and associates with individuals involved in other illegal activity) reliably demonstrated strong associations with any other variables, they were not included in the analysis.

Compression of variables within each of the four categories (violent objectionable material, objectionable material portraying nudity, urination and defecation and bestiality, and risk factors for sexual crime) involved obtaining average scores for the number of variables demonstrated by each offender within each category and coding these according to whether they were less than 0.01 (null), between 0.01 and 0.49 (low), or greater than 0.49 (high). The data for the 10 offenders who scored less than 0.01 across all categories were removed from analysis resulting in a sample population of 96. Where several offenders demonstrated the exact same pattern of offending, only the number and data from the first offender demonstrating the pattern were retained. This process resulted in the data from 60 offenders being discarded due to duplication of results.

The remaining data were subjected to a two dimensional MSA analysis procedure, yielding a coefficient of contiguity of 0.902130. The results of this analysis are shown in Figure 4.6. The facets identified in this analysis describe offenders who scored above 0.49 in each category.

As shown in Figure 4.6, offenders who were identified as selecting "violent" objectionable material, including at least four of the variables related to the portrayal of explicitly harmful activities, degrading activities, and the expression of fear (to the right of the red vertical line), were clearly distinguished from offenders who selected material portraying both naturalist type "nudity" or posed nudity without display of genitals (within the lower left hand blue left hand box). However, some of the offenders who selected material portraying both urination and defecation and bestiality (within the lower right hand green box) were also found to select material portraying more than half of the violent activities listed, and others were also found to select material portraying both naturalist and posed nudity.

Interestingly, it appears to be the interaction between the selection of urination, defecation and bestiality material with the selection of either violent or nudity material that defines those who were identified as demonstrating more than half of the factors associated with previous convictions for sexual crimes (below the pink horizontal line). Having said this, two offenders demonstrating a high proportion of high "sexcrime" related variables were only identified with nudity type material.

**Figure 4.6: {Refer to appendix at the end of this section}**

## *Multidimensional Scalogram Analysis of Offenders by Continuous Computer Related and Collection Variables*

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The vehicle that is used to commit an offence is widely recognised as having investigative significance in determining the psychological meaning that commission of the offence has for the offender.<sup>19</sup> Most of the censorship offences described in this research involved the use of a computer. However, the SSA and MSA analyses undertaken thus far have failed to show any substantial relationship between risk of reoffence or offending in another area and computer related variables (time spent on the computer during the week prior to the investigation, security employed to protect objectionable material, financial investment in computer equipment, applications used to access objectionable material). Given that many of these variables were originally measured as points on a continuum (e.g. low medium or high number of hours on the Internet, low medium or high levels of security), it was decided to undertake one last analysis comparing them in a continuous manner. Collection size was also measured as a continuous variable and, given its association with prior investigation in relation to sexual offending (Chronbachs Alpha =0.375), it was identified as a means for estimating risk in relation to the variables listed below.

An additional MSA analysis was undertaken to compare individual offenders on the basis of whether they demonstrated low (1), medium (2) or high (3) levels of:

- computer literacy
- financial investment in computer and associated hard and software (1. Under \$1,000, 2. between \$1,000 and \$2,000, 3. over \$3,000)
- security (1. saved to ambiguous file name, 2. password protected, 3. encrypted)
- hours spent using the Internet during the week prior to investigation (1. under 10, 2. 10 – 30, 3. over 30)
- size of collection of objectionable images (1. under 17 images, 2. 17 - 785 images, 3. over 785 images).

The data for those offenders who did not use computers in their offences, together with those for whom data regarding their computer use were missing, were removed from the analysis. Where several offenders demonstrated the exact same pattern of offending, only the number and data from the first offender demonstrating the pattern were retained. This process resulted in the data from 28 offenders being discarded due to duplication of results.

Non-dichotomous data lists for each of these variables were generated and subjected to MSA analysis, yielding a coefficient of contiguity of 0.939420. The results of this analysis are shown in Figure 4.7.

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<sup>19</sup> Canter, D. (1994) *Criminal Shadows: inside the mind of the serial killer*. London: Harper Collins; Canter, D. (1989) *Offender Profiling*. *The psychologist*, 2: 12-16; Turvey, B.E. (2002) *Criminal profiling: an introduction to behavioural evidence analysis*. San Diego, California: Academic Press.

The main distinctions identified in Figure 4.7 are between those offenders who demonstrated low levels of the various attributes identified by the different variables and those who demonstrated medium or high levels of these attributes. Specifically, individuals who demonstrated low computer literacy (to the upper left of the orange diagonal line), and low financial investment in computing equipment (to the left of the pink vertical line), spent less time on the Internet (to the left of the red diagonal line) than those who demonstrated higher levels of these attributes. No obvious relationships were observed between size of offenders collections of objectionable material and hours, cost or literacy levels. However, it is of note that all of the offenders who took medium (password protected) security measures to protect their collections (below the blue horizontal diagonal line) were found in possession of medium to large numbers of objectionable images. In contrast, many of those found to employ high levels of security (encrypted – to the upper right of the yellow diagonal line) were found with very few images. This result suggests that the lack of objectionable material identified in the possession of some offenders may have more to do with their ability to hide or conceal the material than it does to do with their relationship to the material.

Of note is that high security was also associated with medium to high levels of computer literacy, investment in computer equipment, and hours spent on the Internet. This group of offenders appears to be highly committed to their offence activities. Therefore, the fact that large collections of objectionable material were associated with previous conviction for a sexual crime may suggest that individuals who demonstrate an interest in sexual offending use objectionable material to supplement that interest. They may be less concerned about the process of obtaining, collecting, or protecting that material than those for whom collecting images is the primary motivator of the offending.

**Figure 4.7: {Refer to appendix at the end of this section}**



Figure 4.2 (from page 110)

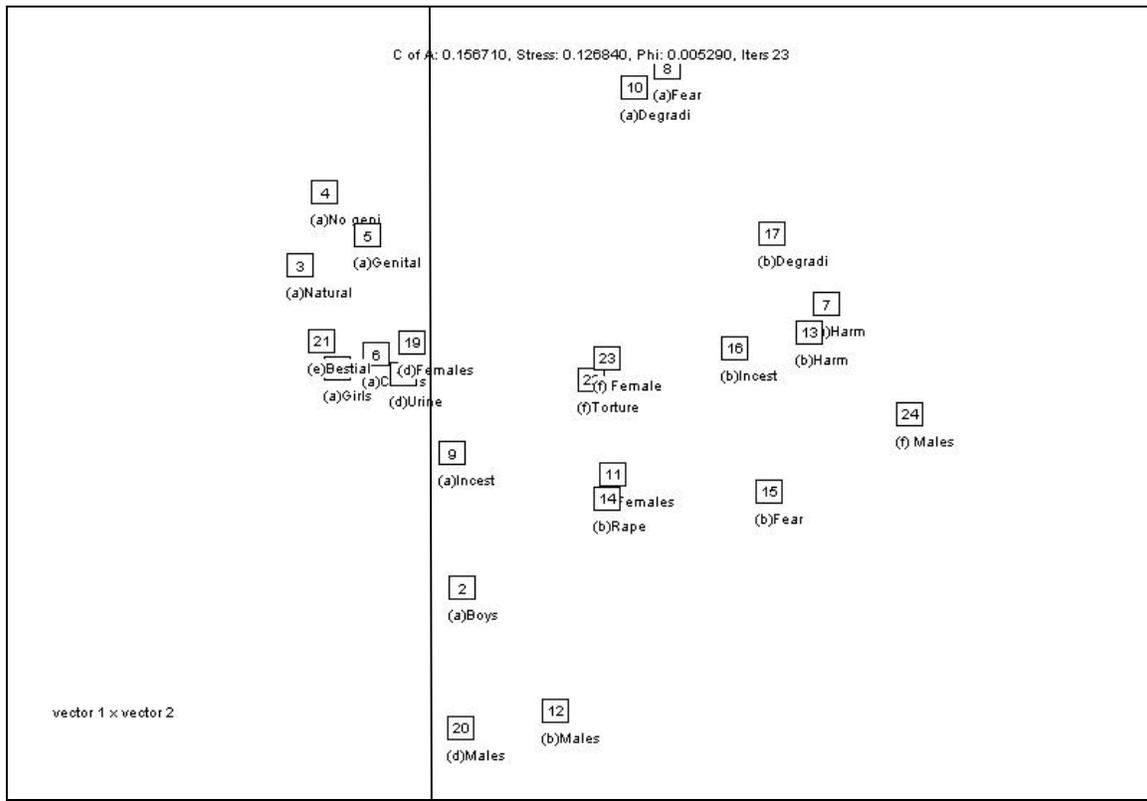


Figure 4.3 (from page 113)

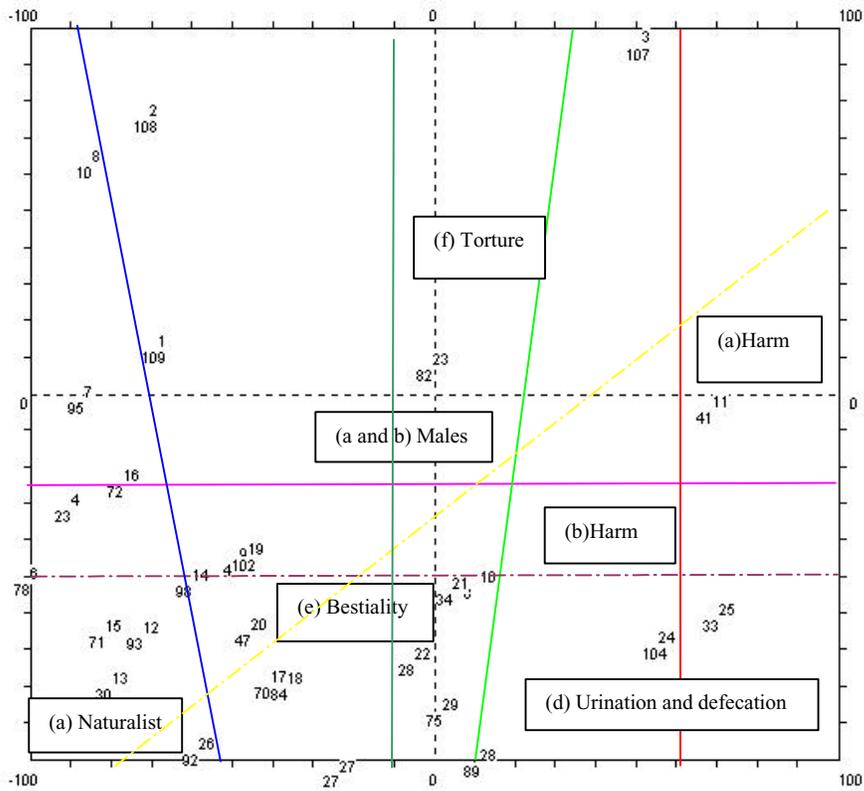




Figure 4.5 (from page 119)

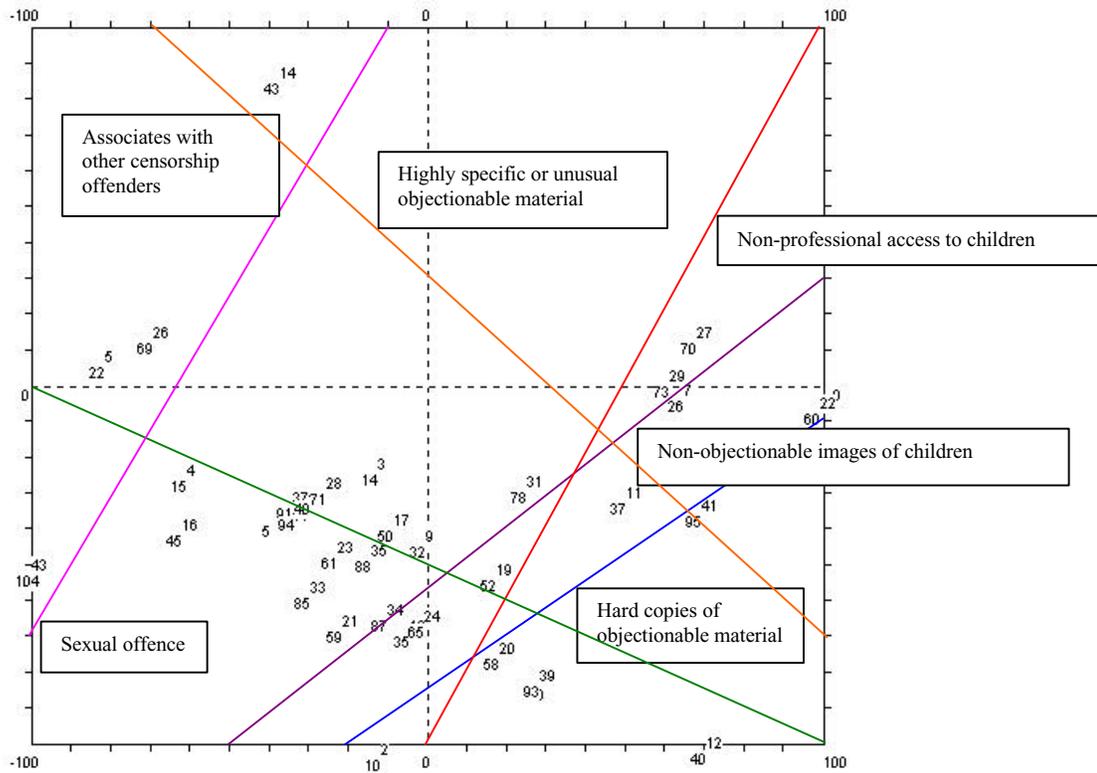


Figure 4.6 (from page 121)

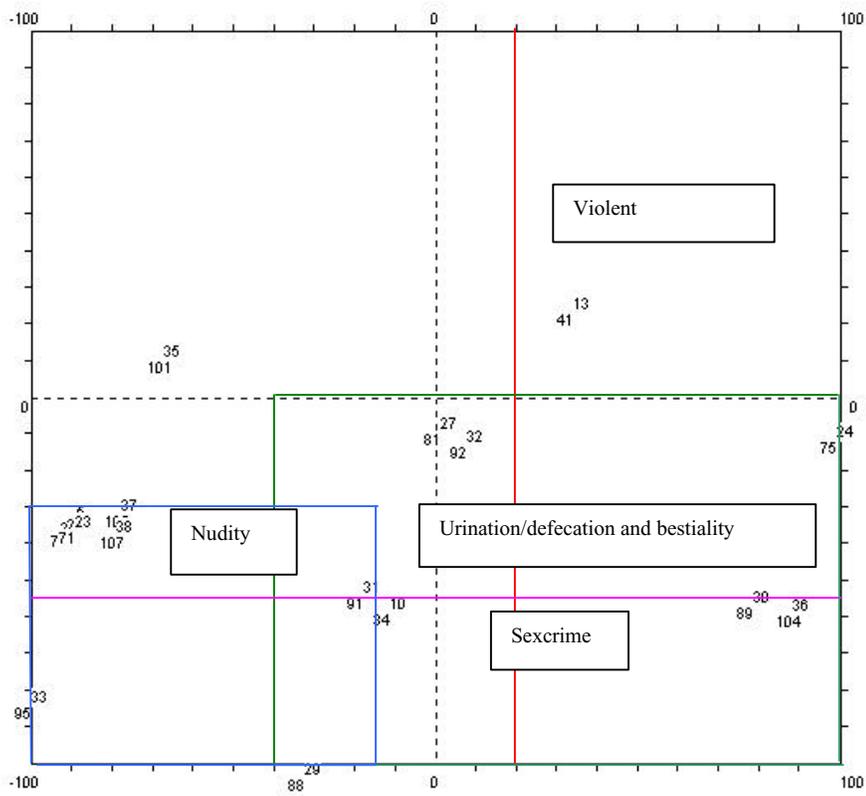


Figure 4.7 (from page 123)

