Developmental perspectives on the behaviour of missing children: exploring changes from early childhood to adolescence

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Abstract

Despite the inherent vulnerability of missing children and the associated emotional intensity for those affected, there has been no academic exploration of child development and missing behaviour. The current enquiry comprised an examination of police case records to determine how the circumstances and behaviour of missing children varies across early childhood (2-6 years; n = 79; 10.3%), middle childhood (7-11 years; n = 175; 22.9%), and adolescence (12-17 years; n = 512; 66.9%). Children were more likely to go missing in adolescence than early or middle childhood, and more boys than girls were reported missing before adolescence, with the opposite pattern found during adolescence. Adolescents travelled further, took public transport more, and were more likely to be accompanied than those in the younger age groups. Children in the youngest age group were more likely to go missing unintentionally, whereas adolescents were more likely to run away intentionally. Based on these findings it is argued that developmentally informed understanding should contribute to future strategies for preventing and responding to missing children.

Introduction

When a child is missing, there can be a considerable impact on the child, their family and the wider community. Children are at risk when isolated from their home environment, with a lack of independent access to basic resources like housing and monetary supplies, combining with immaturity and inexperience to create a dangerous vulnerability (Rees 2015; Taylor, Bradbury-Jones, Hunter, Sanford, Rahilly, & Ibrahim, 2014). It is therefore imperative that research focuses on children's behaviour when they go missing, supporting police search strategy and maximising chances of locating missing children quickly. The factors that influence children's missing incidents are likely to change according to their circumstance and developmental stage (e.g., early childhood, middle childhood, adolescence). However, to date there has been no academic exploration of the behaviour of children who go missing at different developmental stages, nor how developmental psychology might underpin this behaviour. The current study is designed to fill this research gap.

While various definitions of missing persons exist (see, Taylor et. al. (2018) for a review), police in the UK define a missing person as "*Anyone whose whereabouts cannot be established and where the circumstances are out of character or the context suggests the person may be subject of crime or at risk of harm to themselves or another*" (Association of Chief Police Officers (ACPO), 2010; ACPO, 2013).

Under this definition (and earlier definitions, see ACPO (2005)), children (classified as under the age of 18 years) can be reported as 'missing' to the police in a variety of situations. They can be intentionally missing (i.e., run away from home), but they can also be unintentionally missing – they may become lost geographically, fail to realise that they have stayed out beyond their expected return time, or they can be taken against their will by another person (i.e., abducted) (Biehal et al. 2003). The last of these circumstances is a

criminal and unusual occurrence in which the child is a victim rather than a proactive party, and will not be considered further here (see, Newiss & Traynor, 2013 for a comprehensive study of child abduction in the UK). In contrast, a child being reported missing is a relatively common event, with estimates suggesting one in seven UK children will run away before the age of 18 and approximately 2.8 million children in the United States run away from home each year (Greene, Ringwalt, Kelly, Iachan, & Cohen, 1999). Research into these missing children incidents tends to focus on specific practical factors such as outcome analysis or the effectiveness of missing person posters (e.g., Lampinen, Arnal, Adams, Courtney, & Hicks, 2012; Lampinen, Arnal, & Hicks, 2009; Maxson, Little, & Klein, 1988; Sweeney & Lampinen, 2012; Tarling & Burrows, 2004). To complement this approach, here we take a developmental psychology perspective, which allows the behaviour of children who go missing at different stages to be categorically analysed and compared. We focus on examining how missing behaviour changes from early childhood (i.e., around 2-6 years) through middle childhood (i.e., around 7-11 years) and adolescence (i.e., around 12-17 years), with the aim of providing insight into the characteristics and behaviours of children who go missing at these different stages.

Missing behaviour in childhood

The reasons for children being reported missing may change significantly from early to middle childhood and adolescence. In particular, it seems reasonable to predict that younger children will be more likely to go 'unintentionally missing' (i.e., be late home or geographically lost). For example, young children may become lost in supermarkets and shopping centres, or wander from their own home or school caught by the lure of something more exciting or in the bustle of a group (Gibb, 2010). In early childhood, there may be

confusion between reason and fantasy, and personal interests that can capture attention begin to develop (Koester, 2008). While some children may be given parental authority to play unsupervised within a pre-determined range of the home (Anderson and Tindal 1972), they do not always adhere to this, travelling into less familiar territory and subsequently becoming lost (Hart 1979). Once lost, the child may try to get home or make contact with their guardian but be unable to do so, or may be too young to know how to return home or make contact (Sedlak, Finkelhor, Hammer & Schultz, 2002).

The scenario of getting lost is most likely when the child has low awareness of their geographical environment. In early childhood, this can happen relatively close to home as it has been suggested that pre-operational children (younger than about seven years) cannot process the complex requirements of effective spatial cognition and behaviour (Downs & Liben, 1987, 1988, Liben 1991; Liben & Downs, 1989). Experimental research has shown that as age increases children become more adept at route finding and navigation, making fewer route-reversal navigation errors when specified route landmarks are removed prior to retracing (Heth et al. 1997). Similarly, younger children (around six years) are less likely to know the correct direction to turn at intersections, and older children (around 12 years) wander off-route less than younger children when distant orientation cues have been pointed out to them (Cornell et al., 1989). Further, older children more often report using additional landmarks than those specified compared to younger children (Heth et. al. 1997; Cornell et. al., 1992). Consequently, adolescent's spatial cognition and navigational skills should prevent them from becoming lost unless they are in a new environment that is geographically distinct from their own home. It would therefore be expected that being unintentionally missing would be a more common circumstance in early childhood and middle childhood than adolescence.

As children begin to mature and acquire a degree of independence from parental control, they may be more associated with a second type of 'unintentional' missing behaviour, when they fail to return at a curfew time (i.e., when expected by caregivers) due to misunderstanding or carelessness. This may be particularly relevant to middle childhood, a period characterized by increasing independence in activities (e.g., going to a friend's house, or to a recreational area), but higher parental supervision than the teenage years (Dishion & McMahon, 1998; Steinberg, 1990). At this stage, caregivers may become anxious when they do not know the child's location and make a report to the police, whereas the child may be unaware of the anxiety and return of their own accord to face unexpected police activity. Importantly, children who are unknowingly missing may not actually be in a vulnerable situation, because although their whereabouts are unknown to their caregivers, they are not exposing themselves to the dangers of staying away from familiar environments.

In contrast to unintentional behaviours of becoming geographically lost or failing to return on time, children can also intentionally go missing from home. Intentional missing behaviour, or 'running away', is typically labelled as such when it involves deliberately spending time away from home (Rees, 2011; Office of Juvenile Justice and Delinquency Prevention (OJJDP), 2017). Children categorised as intentionally missing are more likely to be older children who consciously remove themselves from a situation, often connected with unauthorised absence from home or substitute care (Wade et al., 1998). While this intentional missing behaviour is generally described as 'running away' from something (e.g., running from care or school), it can also relate to 'running to' a situation (e.g., wishing to be with a friend or romantic partner) (Biehal and Wade, 2002).

The level of intentionality ascribed to a child's missing behaviour may determine the police response. Based on the inherent vulnerability of children, generally all unexpected early and middle childhood cases will be immediately graded as high risk and resources

deployed to maximise the chances of a fast and safe location (ACPO, 2005; ACPO, 2010; ACPO, 2013; National Cenre for Missing and Exploited Children (NCMEC), 2011). Adolescents who have known vulnerabilities (e.g., learning difficulties or mental health issues) are also graded high risk and responded to in a similar manner. In contrast, adolescents with a history of repeat missing episodes may not be graded as high risk and elicit an immediate response, and they may be classified as absent rather than missing. An example would be a young person who regularly fails to return to a care home within the timescales of an agreed curfew. In such cases, actions to locate the young person and gather information regarding their whereabouts would be agreed with the informant and a review time agreed to reassess the risk (ACPO, 2010; ACPO, 2013; NCMEC, 2011), representing a much less urgent response.

Currently, there are no specified age ranges against which the police assess whether a missing child or young person should be graded as high risk. Essentially, risk assessment and resource allocation decisions are made on the basis of professional judgment, which should take the age, perceived vulnerability of the child and other circumstances of the case (e.g., local environment, time of day, weather conditions) into account. Where an investigation and search is initiated, a number of immediate actions are undertaken including taking detailed statements from the informant (generally a parent or guardian) and other key family members or friends; searching the home address for signs of possible intentions or whereabouts; conducting house-to-house enquiries; reviewing closed circuit television images; and, critically, initiating a search around the place the missing child was last seen or known to be (ACPO, 2005; ACPO, 2010; ACPO, 2013; NCMEC, 2011). The search will occur concurrently with the investigation. Importantly, fundamental police decisions regarding where to search and how far to search are predominantly based on officer knowledge and experience, rather than by any form of scientific evidence base (Fyfe, et. al., 2014). It is

therefore important to identify and disseminate developmental patterns of the behaviour of missing children, to support police search strategy.

Cognitive developmental changes

Nationally available UK police statistics consistently indicate men and boys account for more missing incidents annually (53.9%) than women and girls (National Crime Agency, 2017). In the US, national police recorded statistics are not currently available, but the most recent survey based estimates suggest the rate of children with potential missing episodes was 6.3 per 1,000 in 2013 (Sedlak, Finkelhor and Brick, 2017). Beyond this cursory data, however, virtually nothing is empirically known about the profile of age or gender associated with missing. Age patterns are likely to be associated with cognitive developmental changes. In particular, the change from childhood to adolescence around the beginning of adolescence delivers a number of developmental changes that may be relevant to intentional missing behaviour. Steinberg and Cauffman (1996) suggest that the cognitive elements of maturity that influence adolescent judgement include *responsibility* (i.e., autonomy and the ability to make independent decisions) and *temperance* (i.e., the ability to consider options and risks rationally and act without impulsivity). Across adolescence, individuals do show a gradual increase in autonomy and independence (Steinberg, 1990), taking self-reliant decisions which may bring them into conflict with authority figures and lead to arguments that trigger missing episodes. Full autonomy develops late in adolescence, with both parental and peer influences remaining influential for most teenagers (Steinberg & Cauffman, 1996). However, there is an important shift between the two with peer relationships changing from a secondary influence relative to family relationships in early childhood, to the prominent relationship in mid-adolescence (Steinberg & Silverberg, 1986; Steinberg & Monahan, 2009). Accordingly, by

adolescence there is an increased chance of young people agreeing to participate in risky behaviours suggested by friends and to feel pressurised to copy the behaviours exhibited by their peer group (Berndt 1979; Blakemore, 2018). It therefore seems likely that episodes of missing behaviour will peak in adolescence, and will also be more likely to be joint (i.e., peer-assisted) expeditions than those that occur in early or mid-childhood.

Steinberg and Cauffman's 'temperance' quality develops more slowly across the teenage years than autonomy, with adolescence being associated with increases rather than decreases in risk-taking. This pattern may emerge because the prefrontal cortex matures after other areas of the brain, reducing the ability to inhibit risky behaviours (for a review see Casey, Jones & Hare, 2008). Sensation seeking increases, and the lack of cognitive ability to inhibit positive responses toward risky choices when they are triggered has not yet matured, such as during conflict with parents or other stressful life events (Casey, Jones, & Somerville, 2011; Steinberg, Icenogle, Shulman, Breiner, Chein et al., 2018). This 'dual-system' of heightened sensation seeking combined with immature self-control creates a peak of risk-taking behaviour in adolescence that is likely to be discernible in incidents of intentional missing behaviour in adolescence.

Circumstances of children reported missing

Although published reports detail basic demographics of children who go missing, there are fewer studies exploring children's circumstances and reasons for becoming reported missing. In recent years, some interview and survey data has been analysed to address this, identifying risk and protective factors. Hill, Taylor, Richards and Reddington (2016) note that 'return interviews' (discussions between care workers and children and young people who have returned from a missing episode) highlight difficult family situations including abuse

and neglect as a common reason for leaving. Similarly, in a survey of UK adolescents (aged 14-16 years) who ran away from home, Rees (2011) found that respondents were three times more likely to have run away from home in the past year if there had been a significant change in their family structure during this time. Further supporting the role of insecure home circumstances, almost a quarter of adolescents who self-reported living in low warmth-high conflict environments had run away in the previous year, compared to less than 2% of those who reported living in high warmth-low conflict environments (Rees, 2011). Family relationships are, therefore, a key element in missing behaviour.

In a related issue, children who are cared for outside of the family home (i.e., in care institutions or foster care) are more likely than other young people to go missing (Rees & Lee, 2005), with the rate of adolescents in care running away estimated to be up to five times that of the average (Rees, 2011). One reason for this propensity to go missing is that young people in care are more likely than other children to suffer from attachment issues, removing a potential protective factor from their tendency to stay at home (see Atwool, 2006). However, there are also more immediate triggers. Taylor et al. (2014) explored young people's experiences of going missing from care using focus group discussions and found that common reasons concerned boredom in their residence, friction around authority figures, and a desire to be reunited with family members. While the first of these reasons may be generalisable across all young people, children in care are more prone to struggles with authority figures because of a lack of both secure attachments and secure boundaries in their early development (Atwool, 2006; Vorria, Papaligoura, Sarafidou, Kopakaki, Dunn, Van IJzendoorn, & Kontopoulou, 2006). Those who do have a strong attachment to their family members may have an understandable motivation to leave their current place of residence to reunite with their loved ones. Across all developmental stages, then, children who are in care are more likely than other children to go missing. Further, because the proportion of children

looked after by local authorities increases with age (National Statistics, 2018), this factor is likely to be more prominent in adolescent missing behaviour than earlier in childhood.

A further exacerbation of missing incidents in adolescence may be the high incidence of diagnosed mental health disorders compared to earlier in childhood (for a review see Blakemore, 2019). This is likely to be an important factor when considering children's missing behaviour because it has been identified as a key factor of adult missing episodes, where it is estimated that approximately 80% of missing adults have a clinical or general mental health diagnosis which may act as a predisposing factor for missing as well affecting their vulnerability while missing (Gibb & Woolnough, 2007). Approximately 10% of British children and adolescents have at least one mental health problem (Ford et al. 2003. Meltzer et al., 2000), with common problems including depression, generalised anxiety disorder, self-harm and eating disorders, as well as processing disorders such as Attention Deficit Hyperactivity Disorder (ADHD) and autism spectrum disorders (Mental Health Foundation 2013). Comorbidity of more than one problem is also not unusual for a child (Meltzer 2003a). There is also an increasing risk of children abusing alcohol or taking illegal drugs in adolescence, both of which can be related to mental health problems (Winstanley et al. 2012).

Learning difficulties may also affect missing behaviour across development. Rees (2011) reports that nearly a fifth (18%) of the adolescents surveyed who identified as having a learning difficulty had run away from home, twice the overall rate. While a diagnosis of mental illness may disproportionately be associated with missing incidents in adolescence, it seems reasonable to predict that diagnosis with these specific developmental disorders may increase the chances of going missing across development.

The current inquiry

The current inquiry is designed to test predictions about the characteristics and behaviours of children who go missing. It entails an exploratory examination of historical police-recorded data concerning children reported missing, focusing on a previously collated (but unanalysed) sample of missing person reports filed by multiple UK police forces across a seven-year period (1996-2003). These data will be explored to examine whether different behavioural patterns emerge at different stages, as well as whether developmental changes associated with early childhood, middle childhood and adolescence influence missing proclivity. Patterns of data within the missing population will be explored statistically so that the reliability of any differences detected within the current sample can be ascertained. In line with national statistics, it is predicted that more boys than girls will have gone missing, and that older children are more likely to go missing than those at earlier stages. It is expected that there will be a shift in reason for going missing across childhood, with unintentional missing behaviour dominating early and middle childhood, and an adolescent peak of intentional incidents. Children who go missing are expected to show higher than population levels of mental health issues and learning difficulties, and are more likely to live outside of the family home.

In terms of missing children's behaviour, it is expected that as age increases, the distance between location missing from and location found will increase, the timescales in which children are located will increase and the nature of the locations visited will change such that younger children will be found closer to home while older children and adolescents will purposefully go further and to locations for entertainment (i.e., town/city centres) or to visit friends and family. Those in early childhood are less likely to be accompanied than those in adolescence due to increased peer influences and associated risk taking in adolescence.

Presenting data relating to these factors will provide a much-needed insight into how missing behaviour changes across development, supporting a more effective police response strategy and the development of wider multi-agency policies to address broader problems associated with missing children.

Materials and method

Data collection

The data on which this paper is based was collected for a project which was conducted while the first author was employed within the UK police service. The original project was driven by the police service with the aim of developing behavioural profiles of missing people to support real-time risk assessment and response decision making and search during police-led missing person cases (see, Gibb & Woolnough, 2007). It was required that the data relate to the whole of the UK, and not just one or two forces. Consequently, all UK police forces (52 at the time of data collection) were invited to provide cases of individuals who had been reported missing during the period from the 1st April 1996 to 31st March 2003 for inclusion in the project. While this sampling period could be construed as quite old, it is argued that human behaviour remains reasonably consistent over such relatively small periods of time, and therefore analysis of this data is still of importance. Furthermore, this is the first study to present and analyse data on the developmental aspects of missing persons and so acts as an important initial contribution to the literature. At the time of data collection, virtually all police forces did not have electronic or centralised systems for recording and managing missing persons and so were not able to sample cases in a fully randomised manner. Instead, a designated member of staff in each force was responsible for randomly

selecting and photocopying cases from those recorded and held in hard copy in each operational division of the force.

A total of 22 police forces (42.3% of those sampled) provided paperwork for 926 missing incidents relating to under 18 year olds. It is not possible to calculate what percentage of missing child cases recorded by the contributing forces this sample relates to as strategic counts were not made by police forces at that time, and continue to be difficult for forces to estimate. Furthermore, each contributing force provided a different numbers of cases. The limitations of this sampling methodology are common with other missing person studies to date (e.g., Tarling & Burrows, 2003), but did produce an indication of the nature of the cases reported to police forces.

All of the cases were closed (i.e., the missing child had been located). For $n=3$ (0.3%) of the total incidents, the missing child was found dead. This rate is similar to previous research which estimated 0.6% of all missing incidents (adults and children) result in a fatal outcome (Newiss, 2004), and provides reassurance that the sample is not biased in this regard. In two cases the child's death was as a result of murder and in one case the death was accidental due to acute alcohol intoxication. Consequently, in all three cases it can be argued that the individual did not have full control of their own behaviour and so they were not included in the final sample for analysis. Further, a single case relating to a one-year-old was excluded from the final sample on the basis of the child not being independently mobile.

Some cases in the sample provided by police related to repeat incidents by the same individual (i.e., a previous or subsequent missing episode was also in the data set). Content analysis identified that n=237 (25.7%) were 'repeat' cases. This was where characteristics (i.e., name, date of birth) allowed a match across cases to be identified. To avoid biasing the data with repeat cases, only one case for each child within the data set was included[1]. The first known case for repeat individuals was used rather than a later case as this is a more

appropriate comparison with single missing incidents (i.e., the individual's first missing incident). Consequently, only single cases (n=685) and the first chronological case for those with known repeated cases (n=81) were included, resulting in a final sample of 766 cases.

Sample characteristics

The final dataset (N = 766) contained 413 incidents relating to males (53.9%) and 353 incidents relating to females (46.1%). As summarised in Table 1, a total of 79 cases were classed as being 'Early childhood' (aged 2-6 years inclusive), with 175 cases classed as 'Middle childhood' (aged 7-11 years inclusive), and 512 cases (66.8%) belonging to the 'Adolescence' category (aged 12-17 years inclusive). Race data was not reliably recorded, with ethnic origin not included in many police forms at the time in which the data was collected. This sample characteristic could therefore not be reported.

Coding

A typical missing person case file contains a wide range of descriptive details regarding the missing person, including any issues in relation to known vulnerabilities (e.g., suicidal intent, mental health concerns), the informant who reports the person missing, details regarding the time and location last seen, actions conducted as part of the investigation and search, along with details of the action outcomes, and details of the location of the missing person.

Following the initial familiarisation and reading of 30 case files (by the first author and a police officer with whom she worked on the original police service led project for which the data was collected (see, Gibb & Woolnough, 2007)), a provisional coding framework was developed which reflected the nature of the full information contained within the case paperwork. In this manner, all possible information which could be coded was

identified and categorised. Through an iterative process, these provisional categories were refined as the coding of the remaining cases progressed. In this manner, if a potential new code was identified, it was discussed/agreed between the two coders and added to the coding framework. Cases which had already been examined/coded were re-scrutinised to ensure appropriate and consistent coding across all of the cases. As discussed by Canter and Allison (2003), there is a great deal of variation across police records in terms of the detail and quality of information recorded. Consequently, the absence of a piece of potentially relevant information (e.g., a mental health issue) cannot be taken as an explicit indicator that this was not present in the case. This can result in a high level of 'unknown' classifications during the coding process. However, by applying this strict criteria to the coding process the resulting data set is more reliable and conservative. Data was coded and entered directly into the Statistical Package for the Social Sciences for subsequent analysis. Distances were calculated using Travelmanager GB Office© CD-ROM (1999).

Results

Demographics: Age and gender patterns

Across the sample, age at time reported missing ranged from 2 to 17 years with a mean age of 12.2 years (SD=3.5). As can be seen in Figure 1, the majority of the cases related to adolescents (66.8%), followed by middle childhood (22.8%), then early childhood (10.3%). In line with national police missing person statistics (National Crime Agency, 2017), males accounted for a slightly higher percentage of the sample than females (53.9% vs. 46.1%). However, this pattern varied by age (χ^2=57.7, df=2, $p<.001$), with more males being reported missing than females in both early and middle childhood, whereas more females were reported missing than males in adolescence. Bonferroni-corrected z-tests

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revealed that the gender proportions differed significantly at adolescence from the younger two groups, which did not differ significantly from one another. Corresponding with this gender pattern, the mean age for males to be reported missing (11.5 years, SD=3.7) was younger than for females (13.1 years, SD=3.1), $t(764)=6.627$, $p<0.001$.

Type of missing behaviour

Missing cases were categorised as 'intentional' or 'unintentional' only if the police description made this classification clear (e.g., Intentional: '*'failed to return home because had been grounded by parent', 'ran off', 'argument with foster mother'*; Unintentional: *'cycling, unaware of time, did not realise they had been away so long'*). Classification was possible for 344 cases (44.9% of the sample), with the remaining cases (e.g., *'walked about streets with friends'*) not included in the analysis. As Figure 2 shows, intentionality was associated with age ($\chi^2=167.6$, $p<.001$); there was a tendency for younger children to be unintentionally missing (e.g., lost or late) whereas older children overwhelmingly 'ran away' (i.e., went missing intentionally). Bonferroni-corrected z-tests confirmed that the proportion of children going missing intentionally vs. unintentionally were significantly different from one another within both the early childhood category and adolescence, with this difference not being statistically reliable in middle childhood.

Circumstances at the point of going missing

For the majority of the cases across the sample in which location at time of going missing was recorded (n=704), this location was urban rather than rural (see Table 2), however there was no reliable association between age group and location ($\chi^2 = 4.78$, $p =$

.092). The main residence of the child was recorded by police in n=646 cases, with 80.2% of children living within the family home (i.e., parents/step parents or extended family members), and the remainder categorised as living in residential care (i.e., local authority care homes or boarding schools; 11.0%) or foster care (8.8%). Notably, the proportion of cases of missing children who lived outside of the family home was 18 times greater than the contemporaneous figure for England (0.6%; Simkiss, 2012). As expected, there was a significant association between residence and age group (χ^2=20.09, p<0.001). Bonferroni-corrected z-tests showed that more children lived with family members in early childhood than in middle childhood or adolescence, whereas more children in adolescence lived in residential care than those in early childhood (see Table 2).

Levels of clinical diagnoses in the missing sample were explored by coding diagnosis of a mental health disorder (e.g., depression, anxiety, schizophrenia) or a processing difficulty (ASD, ADHD, behaviour problem), so that the data could be compared to contemporaneous reports. ADHD was the most common diagnosis (41 cases, 5.3% of total sample), followed by depression (12 cases, 1.6%) and personality disorder (6 cases, 0.8%). All other diagnoses were associated with fewer than five cases across the sample. Small cell sizes precluded detailed analysis of how these groups varied with age, but a dichotomous 'present or absent' clinical diagnosis classification revealed no significant association between diagnosis and age-group (χ^2=1.44, p = 0.486) (see Table 2). Overall, clinical diagnoses were reported in 11.4% of the missing sample, outside the confidence intervals reported with contemporaneous national estimates of incidence (9.6% diagnosed; 95% CI 8.8% – 10.5%) (Green et al., 2005). In addition to the diagnosed frequency, a further 14.0% of children in the sample were reported by family and friends to have undiagnosed mental health or behaviour problems, further supporting suggestions of a high incidence of these issues in this group.

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The incidence of learning difficulties in the sample was calculated on the basis of a clinical diagnosis of 'learning difficulties', 'special needs', 'low IQ' or 'dyslexia' being included in the police report, revealing an incidence rate of 2.7%. The case reports do not distinguish between mild, severe and profound learning difficulties, but national estimates for children (aged 4-16 years) in England suggest an incidence of 4.2% combined across these categories, a proportion more than 50% higher than the current sample (Emerson & Hatton, 2004). This is counter to the prediction that children with learning difficulties would be over-represented in the missing sample. Although, as with mental health problems, the incidence recorded in case reports is likely to underestimate actual figures. Unsurprisingly, given the low incidence, no reliable association was found between learning difficulty diagnosis and age group (χ^2=2.05, p=.360).

Across the sample, 56 (7.3%) children were known to be taking prescribed or 'over the counter' medication (i.e., medication purchased without a prescription from a doctor), with this factor being significantly associated with age group (χ^2=11.64, p=.003). While 28 cases in the sample (3.7%) were known to be abusing illegal drugs and/or alcohol, all bar one of these cases related to adolescents. Within the adolescent group, the proportion reported to be using illegal drugs or alcohol was 5.3%, which is lower than contemporaneous national estimates of 11-16 year olds that suggest 9% are regular drinkers and 8% had taken drugs at some time (Green et al., 2005). However, it should be noted that the low numbers of drug and alcohol issues reported in the current sample are likely to underestimate prevalence due to inconsistencies in reporting and police recording practices. In a very small number of cases (n=7), the children were known to have taken drugs/medication immediately prior to being reported missing, a quantity too small for further analysis but suggesting this factor was not an important driver in missing episodes, even among adolescents.

The final element of circumstances at the time the child went missing was their last known activity, which was coded according to whether it was known to be characterised by a negative or adverse personal circumstance. This was defined for coding as the police record including an argument with the family or peers, trouble at school (being punished by staff or bullied), or another obvious negative event (e.g., abuser being released from prison, bereavement). Across the whole sample, 34.1% of children were known to have experienced adverse personal circumstances immediately prior to the missing episode. Adolescents and those in middle childhood were significantly more likely to leave or last be seen in adverse circumstances than those in early childhood (χ^2=23.9, p<0.001; see Table 2).

Behaviours / features of the missing episode

a) Time and distance

Across the whole sample, timescales from the point at which the child was last seen by the person reporting them missing, to the point at which they were located was available for n=739 cases (9.65%) and ranged from 10 minutes to 51150 minutes (35 days). Age group medians are shown in Figure 3. A one-way analysis of variance confirmed there was a significant difference between the age groups, $F(2,736) = 23.66$, $p < .001$, with post-hoc Tukey tests revealing that adolescents were missing for longer (median 1230 minutes (20.5 hours), SD 4755.8) than those in early childhood (median 117 minutes (1.95 hours), SD 955.9; p <.001) and middle childhood (median 255 minutes (4.25 hours), SD 969.5; p<.001). The early to middle childhood groups did not differ significantly from one another ($p = .714$).

The distance travelled, measured as either distance to the furthest known point (if the child returned of their own accord) or distance from the place missing from to the location

found (if the child was traced), was not available from police reports in 90 cases (11.7%). Across the remaining sample (n=676), the furthest known distance travelled ranged from 0 to 689 km. The majority of the cases (97.5%) involved distances less than 200 km, so 2.5% were responsible for the larger distances in the range of 200 Km – 689 km. Age at time reported missing was positively correlated with distance travelled (r=1.84, p<.001; see age group medians in Figure 3). A one-way analysis of variance confirmed there was a significant difference between the age groups, $F(2,673) = 7.23$, p=.001, with the early childhood group travelling a median distance of 0.6 km (SD: 1.8; range 0 to 14 km), the middle childhood median distance being 1.2 km (SD: 68.6; range: 0 - 689 km), and the adolescent group median distance being 4.0 km (SD: 63.5; range: 0 - 582 km). Post-hoc Tukey tests revealed that the significant age effect was driven by a jump in distance by adolescents; there were no significant difference in distance travelled between early and middle childhood (p=.530), but the differences between adolescence and the two younger groups were significant (early childhood to adolescence p=.004; middle childhood to adolescence p=.022).

Additional exploratory analyses were conducted on the missing behaviour of boys and girls, to determine whether gender may play a role in features of the missing episode. It was found that girls tended to go missing for longer than boys, $F(737) = 6.044$, $p = .014$, with girls' missing episodes lasting a median of 990 minutes (16.5 hours; SD: 4428 minutes) while boys' lasted a median of only 512 minutes (8.5 hours; SD: 3688 minutes). Corresponding with this longer episode, girls also tended to travel further (median 3 km, SD: 76 km) than boys (median 1.6 km, SD: 45.6 km), $F(1,674) = 8.589$, $p = .003$.

b) Accompaniment

Children were coded as being accompanied if they were with someone at any point during their missing episode (e.g., someone was with them during all or part of their journey or they visited someone); if there was no mention of a companion in the police report the children was classed as unaccompanied. The majority of the sample were accompanied at some point (n= 532; 81.2%), but there was a marginally-significant association with age group (χ^2=6.19, p<0.045). Older children more likely to be accompanied, although Bonferroni-corrected z-tests did not demonstrate reliable differences between any specific pairs of age groups (see Table 3). The relationship between the child and the person accompanying them was not recorded in 367 cases (69.0% of the 'accompanied' sample). In three additional cases (one early childhood and two adolescents), the accompanying person was a stranger. Excluding these cases, the vast majority of the remaining sample (n=396) were more likely to be accompanied by friends (any peers, including boy/girlfriends; 88.4%) than relatives (any family members; 11.6%). While this pattern was evident across all age groups, there was an association between companion type and age (χ^2=34.2, p<.001), with Bonferroni-corrected z-tests confirming that adolescents were more likely to be accompanied by a friend than those in early or middle childhood (see Table 3).

Interestingly, children who were known to be accompanied tended to be missing for longer (median 960 minutes (16.0 hours), SD=4519.4 minutes) than those who were unaccompanied (median 325 minutes (5.4 hours); SD=3083.79, t(629)=-2.399, p = .017). However, despite being missing for longer, the children who were accompanied did not travel further than those who were alone (accompanied median 2.1 km (SD 63.3), unaccompanied median 1.85 km (SD 74.1); t(583)=0.73, p = .464).

c) Location visited

Missing children visited people or places which were classified based on their apparent principal motivation: visiting friends (n= 275); city/town centre (n=211); other (e.g., playing outside; visiting a park) (n=88) or going to relatives (n=80) (see Table 3 for proportions by age group). There was an association between age group and place visited (χ^2=45.93, p<.001). In particular, Bonferroni-corrected z-tests revealed that adolescents were significantly more likely to visit friends (including boy/girlfriends) than younger children (see Table 3), and those in early childhood were significantly more likely to visit places classified as 'other'. Corresponding with the largely unintentional missing behaviour associated with younger children, closer inspection of report classifications revealed that in early childhood most of the children in the 'other' category were described as 'outside playing' (68.0%).

d) Mode of transport

The mode of transport used by children while missing was classified where available (87.7% of cases). Travelling on foot was the most common mode of transport (n=506), followed by public transport (n=107), car (n=27) and bicycle (n=24) (see Table 3 for proportions by age group). While travelling on foot was most common within each age group, there were significant differences across the groups (χ^2=69.8, df=6, p<0.001). As Table 3 shows, the most common mode of transport was 'on foot' across all age groups, but a notable pattern was a lower proportion of adolescents walking compared to middle childhood, and a corresponding higher proportion of adolescents using public transport; indeed nearly a quarter of adolescents used public transport while missing compared to less than 5% in both other age groups.

Circumstances at the point of being found

Information on the circumstances of missing children being found was included in most police reports. For just six cases (0.8%), the person who found the missing child was not recorded. After exclusion of these cases, just over half of the sample (n=381) were located by the police, followed by searching relatives (n=272), staff/residential carers (n=50), friends (n=31), and members of the public (n=26) (see Table 4 for proportions by age group). There was a significant association between the person who found the missing child and age group (χ^2=62.51, *p*<.001), with Bonferroni-corrected z-tests showing that younger children were more likely to be found by members of the public than older children, with adolescents the least likely to be found in this way. In addition, adolescents were more likely to be located by professional services (police or residential staff/carers) than those in middle childhood (see Table 4).

In five cases (0.7%) the police report did not detail how the child was found; these cases were excluded from subsequent analysis. Across the sample just over half (n=433) were traced by active searching and just under half 'turned up' (e.g., returned of their own accord, made contact or were arrested in an unrelated incident) (n=328) (see Table 4 for proportions across age groups). There was a relationship between method of finding and age group (χ^2=9.32, *p*=.009), with those in early childhood were more likely than those in adolescence to be traced by individuals actively searching, while those in adolescence were more likely to turn up than those in early childhood (see Table 4).

The majority of the cases across the sample were located in urban locations (n=706; 92.2%), echoing their place of disappearance. There was an association between place found and age (χ^2=7.25, p=.027) with a trend towards adolescents being more likely to be found in

rural locations, but Bonferroni-corrected z-tests did not identify any reliable differences between age groups (see Table 4).

Discussion

The current inquiry comprised an examination of missing person police case records to determine how the circumstances and behaviour of children who go missing varies across development. Clear demographic patterns were found, with children being more likely to go missing in adolescence than in early or middle childhood as predicted. Interestingly, more boys than girls were reported missing before adolescence, with the opposite pattern being found in the teenage years. The behaviour of children who were reported missing also varied significantly across age groups. As predicted, the adolescent group travelled further, took public transport more often, and were more likely to be accompanied than younger children. As also expected, younger children were more likely to go missing unintentionally, whereas older children are more likely to run away intentionally.

The pattern of increasing likelihood of going missing with age is important, and in line with expectations. Children have more freedom, capacity to travel (e.g., money), knowledge and peer influence as they enter adolescence (Steinberg & Silverberg, 1986; Steinberg & Monahan, 2009). They are also more likely than younger children to be involved in an adverse situation just prior to going missing, supporting previous suggestions that adolescent missing behaviour is often associated with family conflict (Rees, 2011). The current data suggest that missing occurrence rates should not be applied homogenously to 'childhood', as has previously been the case, but rather broken down into 'childhood' and 'adolescence', given the strikingly different rates of missing reports across these stages.

The different developmental trajectories of males and females was unexpected, with no previous research exploring the data in sufficient depth to show that gender differences may vary from early childhood to adolescence. A pattern of more male than female cases was expected because this is typical of adult missing cases (National Crime Agency, 2017). However, this effect was not found in adolescents, at which point there was a significant change in the proportion of male to female missing children, driven by an increase in female missing person cases. Further, an exploratory analyses of gender differences within the missing behaviour data revealed that girls' missing episodes lasted for significantly longer and involved travelling further distances than boys, with medians in both variables being almost twice the magnitude for girls than boys. Relatively small numbers of young girls being reported missing prevented a detailed breakdown of the interaction between age and gender across the full range of categorical behaviour analyses, but these patterns suggests that gender is likely to play an important role in determining missing behaviour, with girls participating in more extreme episodes.

The reasons for the gender differences identified in the current study are worthy of dedicated further research, given their notable divergence from the typical adult pattern. It is possible that peer influences, hormonal changes and academic pressure, all of which peak during adolescence (see Hollenstein and Lougheed, 2013), create a particularly difficult stage for teenage girls, during which they may need more support if incidents of risky missing behaviour are to be minimised. This is particularly important given the increasingly recognised risk of child sexual exploitation amongst missing young people (Sharp, 2012; CEOP, 2012).

The change from unintentional to intentional missing behaviour at adolescence suggests that it is not only girls who have difficulties at this stage; there is a high incidence of both boys and girls going missing in adolescence relative to earlier in childhood. This corresponds

with an increase in the other risk factors identified in adolescence, such as living outside of the family home, being on medication, drugs or alcohol and experiencing adverse situations such as trouble at school or with peers and family arguments. It is also the stage at which behaviour is characterised as higher in sensation-seeking and lower in temperance (Steinberg, 1990), both of which increase risky behaviours.

Across the age groups, the incidence of living outside of the family home was much higher than the national average as predicted, suggesting that this situation is a significant risk factor in missing behaviour. However, it should be noted that this high figure may be driven in part by the fact that children in residential care may be reported missing to the police at an earlier stage in their disappearance than children living at home, who may therefore have a higher chance of returning home prior to any police involvement. Nonetheless, children living in care may have additional motivations to go missing, with attachment problems, separation from parents and siblings, and a higher chance of a low-warmth home compared to children living in the family home (Atwool, 2006; Rees, 2011).

An additional anticipated risk factor in missing behaviour was clinical diagnosis of a mental health or processing disorder and the current data confirm this, showing an incidence rate above the national level. Reports of suspected clinical problems by friends and family were also very high, although comparison with national statistics is clearly not possible for this factor. ADHD was the most frequent diagnosis associated with missing behaviour in childhood, supporting the idea that a lack of impulse control is a potentially important factor in missing behaviour. Contrary to previous research (Rees, 2011), we did not find evidence of a higher incidence of learning difficulties in the missing sample, but it should be noted that this is not a factor police may routinely record in missing person records. Overall, the data confirm predictions that missing behaviour is considerably higher among vulnerable young people. However, these vulnerability risk factors were not relevant to the majority of missing

incidents; while being associated with children's missing behaviour, they are far from explaining the full picture.

An important factor that emerged from the analysis was the prevalence of an adverse situation immediately prior to the missing incident. In over a third of cases, a negative incident such as a family or peer argument or trouble at school was recorded as the incident antecedent. There was a developmental pattern within this data, with middle childhood and adolescence being significantly associated with increased missing behaviour in response to an adverse situation than those in early childhood. This pattern corresponds with the distinction between intentional and unintentional missing incidents described above, and highlights a key developmental pattern in the data: with age, there is an increasing likelihood of children going missing intentionally in response to a difficult situation. In contrast, young children's missing behaviour is less likely to be intentional and correspondingly, their immediate antecedent situation is less important.

An important predicted change in missing behaviour that occurred at adolescence was an increase in missing episodes that were undertaken accompanied by friends, as opposed to alone or with relatives. Being accompanied increased the duration of the missing incident, which may be due to the child having a place to stay or encouragement in sustaining the missing episode. However, this pattern could also be due, in part, to police response - if a child is suspected to be with a known friend or relative (e.g., after parental separation), the urgency of the search may not be as high. Interestingly, being accompanied did not increase the distance travelled so there is no evidence of a tendency for children to support each other to run away as far as possible.

The duration of missing episodes increased significantly with age, predicted in line with the idea that older children are more likely to be intentionally missing and running away from

an adverse situation, rather than lost or late returning. Correspondingly, there was a predicted significant increase in the distance travelled with age. The developmental patterns of distance and time were notable for a jump in adolescence, with significant differences in both measures between adolescence and the younger groups (but not between these groups). This was linked to capability; older children were more likely to use public transport rather than walking, enabling greater distances to be travelled. During adolescence, young people explore their own identities and a variety of spaces may be important to this process (Skelton and Valentine 1998). Of particular relevance, adolescents in care may be placed in care homes at a distance from previous or familial addresses, increasing the tendency for them to run away to their previous location, to be with their real family or friends (Wade 2003, Rees 2011). This often increases distances travelled, especially for urban cases where young people are likely to be more confident using public transport (Gibb, 2010).

Although older children were more likely to be intentionally missing, they were perhaps surprisingly also more likely to return of their own accord than younger children. This may be a by-product of highly active searches for young children, although there was no corresponding high proportion of those in early childhood being more likely than adolescents to be located by police. Rather, there was a significantly higher proportion of those in early childhood being located by members of the public. This interesting pattern may result from the fact that a young, unaccompanied child (who may be distressed) elicits help from strangers more than a teenager in a similar situation, or from the realisation of another parent that a visiting child should have been returned. These explanations are clearly speculative at this stage, but the pattern suggests that a key factor in a police search may be dissemination of information to the public.

The patterns arising from the current inquiry provide some much-needed clarity on how the behaviour and circumstances of children who are missing varies with development.

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However, there are clear limitations to the analysis performed. In particular, the sampling may not have been representative of police forces, and the analysis of cases from the several forces that did participate was hampered by different recording practices and missing information from individual records. The latter is particularly problematic as it may mask important information – for example, family home was recorded in many cases but family situation (e.g., recent parental split or bereavement) was rarely recorded and therefore could not be analysed. Further, ethnicity and race data were rarely recorded so this important factor could not be included in the analysis. Future research should minimise this issue by requesting police record the factors of interest. Related to this issue is the fact that the current inquiry comprised exploratory analysis of an existing dataset which was relatively old, and it is important to acknowledge that some differences may be observed with a more recent sample. In particular, the potential impact of smartphones on the behaviour of missing children is not addressed in the current study. Despite these limitations, this analysis has yielded important, interesting and novel conclusions, but is a starting point to understanding the development of missing behaviour rather than an exhaustive conclusion.

The developmental factors considered here are outlined to develop a profile of the circumstances in which missing behaviour is more likely across childhood. Risk factors include living outside of the family home, experiencing mental health or learning problems, being on medication, drugs or alcohol and experiencing adverse situations. Boys are more at risk than girls of going missing early in childhood, but this pattern reverses in adolescence. Indeed a clear pattern emerged of behavioural differences before and after adolescence, which suggest that police investigations need to have separate strategies for these developmental stages. Young children are more likely to be missing unintentionally and be located close to home. In contrast, adolescents are more likely to have run away intentionally in response to an adverse situation, to travel further and stay away longer. By analysing the

frequency with which these circumstances are reported in association with reports of missing

children at different developmental stages, the current study provides a much richer picture of

missing incidents in childhood which should contribute to future strategies for not only

responding to but also preventing such incidents.

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FOOTNOTES

1. As these numbers indicate, the analysis of repeat missing behaviour is of high importance.
While these data are not considered further in the current study, they are analysed in
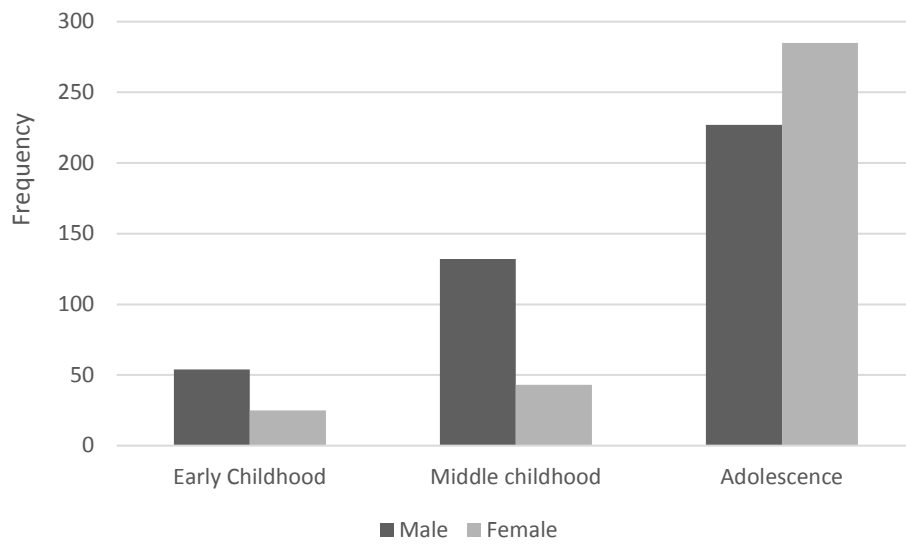detail elsewhere (Woolnough, Cunningham & Taylor, in prep.)

Figure 1: Frequency of males and females reported missing across age groups
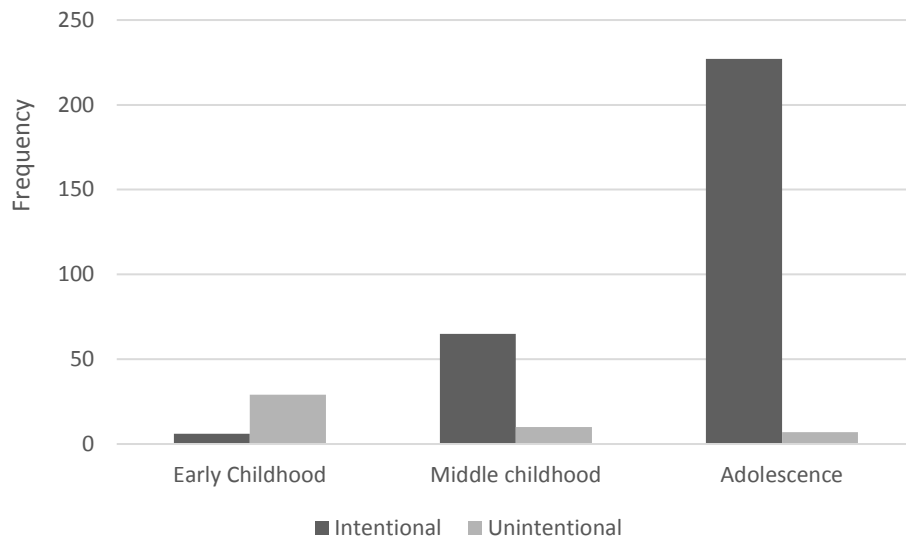
Figure 2: Frequency of 'intentional' and 'unintentional' missing episodes across age groups
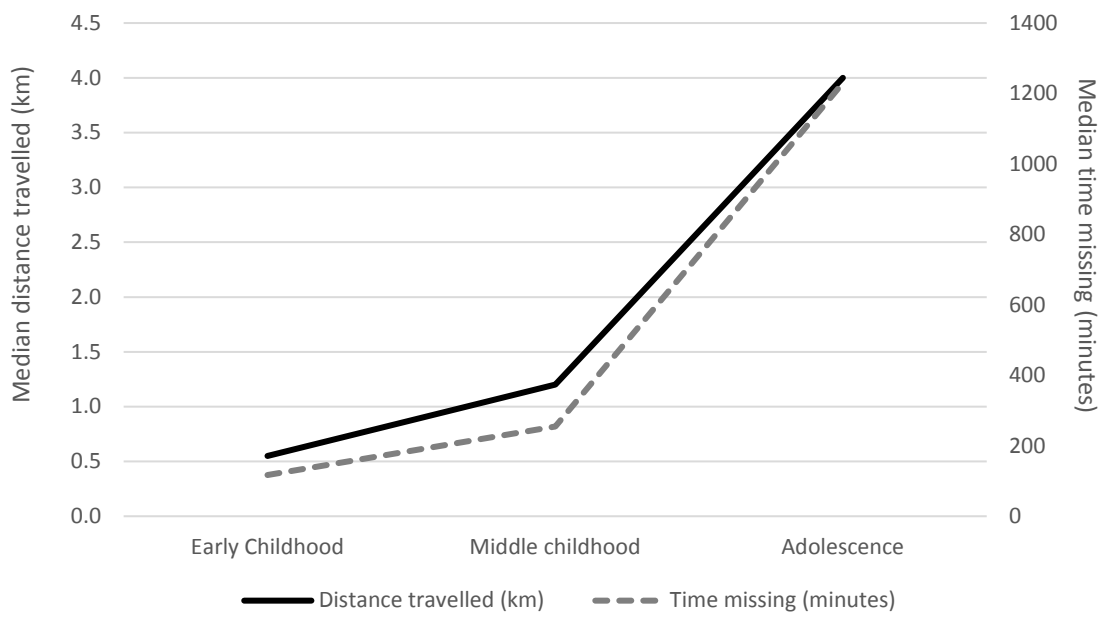
Figure 3: Time and distance associated with missing episodes across the age groups

Table 1: Sample characteristics

	Early childhood	**Middle childhood**	**Adolescence**
N	79	175	512
Percentage of sample	10.3%	22.8%	66.8%
Age range	2-6 years	7-11 years	12-17 years
Mean age	4.7 years	9.3 years	14.4 years

Table 2: Circumstances at point of going missing, as percentage of individuals in each age group

|	% of cases within each age group			Association with age group		
	Early childhood	**Middle childhood**	**Adolescence**	χ^2	**df**	**Sig.**
Location missing from						
Urban	97.5% $_a$	93.1% $_a$	90.6% $_a$	4.78	2	$p =.092$
Rural	2.5% $_a$	6.9% $_a$	9.4% $_a$			
Main residence						
Family home	98.4% $_a$	83.6% $_b$	76.5% $_b$	20.09	4	***p<.001***
Residential care	0% $_a$	6.8% $_{a,b}$	13.9% $_b$			
Foster care	1.6% $_a$	9.6% $_a$	9.6% $_a$			
Mental health						
Clinical diagnosis (mental health condition)	7.6% $_a$	10.9% $_a$	12.1% $_a$	1.44	2	$p=.486$
Diagnosed learning difficulties	3.8% $_a$	4.0% $_a$	2.1% $_a$	2.05	2	$p=.360$
Drugs and alcohol						
Medication	2.5% $_{a,b}$	2.9% $_b$	9.6% $_a$	11.64	2	***p=.003***
Illegal drug / alcohol	0% $_{a,b}$	0.6% a $_b$	5.3% $_a$	11.53	2	***p=.003***
Last known activity						
Known to be adverse	10.1% $_a$	33.1% $_b$	38.1% $_b$	23.9	2	***p<.001***

P-values in bold denote statistical significance at the .05 level

Within rows, each sub-script letter denotes a subset of age-group categories whose proportions do not differ significantly from one another on that criteria at the .05 level (z-test, Bonferroni-corrected)

Table 3: Features of the missing episodes

	% of cases within each age group			Association with age group		
	Early childhood	**Middle childhood**	**Adolescence**	χ^2	**df**	**Sig.**
Accompanied						
Accompanied	71.9% a	77.6% a	83.6% a	6.19	2	**p =.045**
Not accompanied	28.1% a	22.4% a	16.4% a			
Who accompanied						
Friend	65.6% a	76.4% a	92.9% b	34.20	2	**p <.001**
Relative	34.4% a	23.6% a	7.1% b			
Location visited						
City or town centre	25.7% a	39.1% a	31.0% a	43.92	6	**p <.001**
Friends	27.0% a	31.8% a	48.3% b			
Relatives	13.5% a	14.6% a	11.2% a			
Other	33.8% a	14.6% b	9.6% b			
Method of travel						
Foot	82.7% a,b	90.9% b	69.4% a	69.04	6	**p <.001**
Car	5.3% a,b	0.6% b	5.2% a			
Public transport	1.3% a	3.7% a	23.5% b			
Bicycle	10.7% a	4.9% a,b	1.9% b			

P-values in bold denote statistical significance at the .05 level

Within rows, each sub-script letter denotes a subset of age-group categories whose proportions do not differ significantly from one another on that criteria at the .05 level (z-test, Bonferroni-corrected)

Table 4: Circumstances at the point of location

	% of cases within each age group			Association with age group		
	Early childhood	**Middle childhood**	**Adolescence**	χ^2	**df**	**Sig.**
Who found						
Police	40.3% $_{a,b}$	43.4% $_b$	53.9% $_a$	62.51	8	*p<.001*
Friends	3.9% $_a$	5.2% $_a$	13.7% $_a$			
Relatives	39.0% $_a$	39.3% $_a$	34.1% $_a$			
Member of public	16.9% $_a$	4.6% $_b$	1.0% $_c$			
Staff/carer	0% $_a$	7.5% $_b$	7.3% $_b$			
How found						
Traced	70.9% $_a$	60.2% $_{a,b}$	53.6% $_a$	9.32	2	*p=.009*
Turned up	29.1% $_a$	39.8% $_{a,b}$	46.4% $_a$			
Location found						
Urban	96.2% $_a$	96.0% $_a$	90.6% $_a$	7.25	2	*p=.027*
Rural	3.8% $_a$	4.0% $_a$	9.4% $_a$			

P-values in bold denote statistical significance at the .05 level

Within rows, each sub-script letter denotes a subset of age-group categories whose proportions do not differ significantly from one another on that criteria at the .05 level (z-test, Bonferroni-corrected)