Assessing the concordance between child reports and adult observations of single and mixed emotion in children's drawings of themselves or another child

Abstract

The present study assessed concordance between child reported and adult observed strategies to depict single and mixed emotion in the same human figure drawings. 205 children (104 boys, 101 girls) aged 6 years 2 months to 8 year 3 months formed two age groups (6 yrs. 2 mo. - 7 yrs.2 mo. and 7 yrs.-3 mo. -8 yrs. - 3 mo.) across two conditions drawing either themselves or another child. They heard vignettes designed to elicit single and mixed emotion and drew a baseline drawing, counterbalanced happy and sad, and a mixed emotion drawing. Categories of children's verbal reports and adults' observations were similar with some variation of use by condition, age group and emotion type. Mixed emotion strategies were more similar to those observed and reported in happy drawings. Findings are discussed in relation to a framework theory of art and social display rules.

Keywords: Mixed emotion, drawing, coding, self, other

This study was designed to extend comprehension of how children report drawing single positive and negative, and mixed emotions, and how these reports relate to the drawing strategies adults observe in the same drawings for each type of emotional experience. Children' drawings and attendant conversations about the meaning of the drawings are regularly used to supplement professional comprehension of children's feelings about people and events in their lives (Coates & Coates, 2006; Cox, 1992, 1993, 2005; Jolley, 2010; Malchiodi, 2012) and are regularly utilized across educational, legal and clinical settings (e.g., Bekhit, Thomas & Jolley, 2005; Hunsley, Lee & Wood, 2003; Watkins, Campbell, Nieberding & Hallmark, 1995; Woolford, Patterson, Macleod, Hobbs, & Hayne, 2015). Drawings can be used to support interviews in assessment (Bekhit, Thomas & Jolley, 2005; Hammer, 1997) and diagnostic contexts (Hunsley, Lee & Wood, 2003; Lubin, Larsen, Matarazzo, & Seever, 1985). They can also be used to supplement children's verbal eye witness testimonies (Gross & Hayne, 1998; Macleod, Gross & Hayne, 2014; Patterson & Hayne, 2011). However, adult understanding may overlook the likelihood that mixed feelings are encoded in the drawings or adults may perceive drawing strategies differently from how the children report drawing these feelings.

It is important to see how adults code mixed emotions in children' drawings in relation to how children say they have drawn them as these interpretations may shape resultant appraisals and interviews about how children feel about the topics they have drawn (Malchiodi, 1998, 2012). By assessing the concordance between children's reported strategies and adult's observations of these strategies, the present study explored Freeman's (1995) framework theory of art which attests that children's understanding of the drawing process is determined by the sophistication of their

understanding of the intentional links between four elements, namely the artist, the picture, the beholder and the world.

The least researched relationships within this framework are those between the artist and the beholder. Little is known about what children think the viewer will think of their drawings, how they think the viewer will decode information in their drawings and, how this understanding accords. We know that children alter positional information in their drawings when they believe that the viewer will need to understand the location of objects (Light & Simmons, 1983; Sitton & Light, 1992). Children also alter strategies to depict emotional information such as sadness and happiness or a mixture of the two when they are told that a viewer will need to understand the emotional content of the drawings (Burkitt & Watling, 2015; Callaghan, 1999). It has been proposed that the symbolic ability to understand that there will be a viewer of the drawing, or symbol, that represents the world is parallel to the symbolic reasoning skills required to develop a theory of mind which entails the understanding that appearance could mirror something else (Keskin, 2009). However, there is minimal research exploring how children think a viewer will perceive their drawings or how the viewer's perception matches the children's views of how they depicted a topic, especially in affective drawing strategies when children draw to communicate emotion. Thus, in partial exploration of the relationship specified by the framework theory of art between the artist and the beholder, the present study explored the concordance between children's reported and adult observed drawings strategies assessing adult precision in gauging children's use of drawing strategies in relation to affect.

Drawn expressivity of single emotion

Expressive strategies can be broadly classified (Brechet & Jolley, 2014; Burkitt, 2016; Picard & Gauthier, 2012) as literal, for example, where facial features are typically altered, content, where subject matter is altered to reflect a mood such as good or bad weather, and abstract, where formal properties such as line quality, composition and colour are varied in relation to emotion. Children represent single emotions, such as happiness or sadness, in more complex ways between the ages of four to five and eleven years (Brechet, Baldy & Picard, 2009; Burkitt & Barrett, 2010; Ives, 1984; Parsons, 1987; Picard, Brechet, & Baldy, 2007; Jolley, Fenn, & Jones, 2004; Jolley & Rose, 2008). From this younger age, children can alter a range of literal features in relation to specific positive or negative characteristics of different topics, such as using emotion appropriate facial features and actions such as gift giving or stomping (Burkitt & Watling, 2013; Ives, 1984; Jolley, 2010; Winston, Kenyon, Stewardson, & Lepine, 1995).

With age and developing levels of drawing ability (Brechet & Jolley, 2014), children tend to alter the content of figures and scenes in more metaphorical and abstract ways such as portraying a drooping flower to reflect sadness and bright weather to reflect happiness (e.g., Hammer, 1997; Ives, 1984; Jolley, 2010; Koppitz, 1966; Machover, 1949; Parsons, 1987; Picard, Brechet & Badly, 2007). Children also produce features in combination increasingly with age to depict emotion literally and in abstract ways (Burkitt, 2016; Picard et al., 207; Picard & Gauthier, 2012). For example, they may convey a sad mood by using literal frowns and negative characters such as burglars, or convey a positive mood by showing bright weather in a scene involving their favourite colours (Burkitt & Watling, 2015; Burkitt & Sheppard, 2014; Burkitt, Watling, & Murray, 2011).

There is debate about whether the abstract properties of colour choice and size alteration are used reliably in expressive ways. Children may alter colour choices in relation to emotion terms and colour preferences in tasks where they are restricted to choosing one colour (Burkitt, 2008), yet this tendency can be easily overridden when children freely select colours for each drawing (e.g., Crawford, Gross, Patterson, & Hayne, 2012; Picard & Lebaz, 2010). There is also some evidence indicating that children scale up figures they perceive as positive (Cleeve & Bradbury, 1992; Thomas, Chaigne & Fox, 1989) and less reliably decrease the size of topics they perceive as negative. However, there is mounting inconsistent evidence for these effects for experimental tasks (Joiner, Barnett & Schmidt, 1996; Burkitt, Barrett, & Davis, 2004: Thomas, Chaigne, & Fox, 1989: Thomas & Jolley, 1998) and tasks concerning real life events (Jolley & Vulic-Prtoric, 2001).

Recognition and understanding of mixed emotion in childhood

Children's depiction of mixed emotion has recently received attention with research addressing the possibility that children display more than one emotion in their drawings (e.g., Burkitt & Watling, 2015). Children's recognition and understanding of mixed emotion in other people has been found to develop earlier than a recognition and understanding in themselves (Burkitt & Sheppard, 2014; Callaghan, 1999; Larsen, To & Fireman, 2007; Smith, Glass & Fireman, 2015). From 4-5 years, children can match mixed emotion to appropriate vignettes (Kestenbaum & Gelman, 1995) and are sometimes able to report mixed emotions in a fictional protagonist from 3 years of age (Smith et al., 2015). Such recognition in others and in themselves shows an incremental pattern between the ages of 7-12 years, with significant gains tending to appear around the age of 7 years (Donaldson & Westerman, 1986; Harter & Buddin, 1987; Larsen et

al., 2007; Wintre &Vallance, 1994). The precise rate of development tends to depend upon the emotions in question. For example, the emotion terms selected for the present study of mixed happiness and sadness are quickest to be acknowledged, with a lag evident for more complex mixed emotion pairs such as loving and angry (Heubeck, Butcher, Thorneywork &Wood, 2016).

The incremental recognition and understanding of mixed emotion pairings may be related to the development of an affective system that can support co-activation of emotion. However, the influence of such a mechanism on experiences and behaviour is relatively unexplored across childhood (Heubeck et al., 2016). The key adult models of mixed emotion are the circumplex and the evaluative space models. The circumplex model (Russell & Carroll, 1999) specifies that opposite emotions are mutually exclusive and that only high arousal emotions can co-exist, for example, stress and anger.

Alternatively, the evaluative space model (ESM) posits that different operating characterises for positive and negative emotion in the affect system can be activated differently across the nervous system and can result in different behaviours and emotional evaluations (Norris, Gollan, Bernston & Cacioppo, 2010). This model implies that the operation of positive and negative substrates of valence are experientially separable (Cacioppo, Gardner & Berntson, 1999; Cacioppo, Larsen, Smith, & Berntson, 2004) and that any pair of opposite valence emotions can co-occur (Larsen, McGraw, & Cacioppo, 2001). A large-scale review of 63 studies adulthood (Berrios, Totterdell & Kellett, 2015) which varied in emotional pairs and the conceptualisation of underlying models of mixed emotion, namely discreet or dimensional, showed that mixed emotion experiences occur beyond the types of emotion pairs and dimensional or discreet nature of the foundational conceptualisation

of the studies. Berrios et al. (2015) suggested that the affective system could be flexible enough to permit multiple activation patterns of mixed emotion ranging from bipolar responses to blended emotional responses where mixed similar valence emotions are activated and where different patterns of mixed opposite valence emotions are supported. The present study explores the relevance of the evaluative space model in childhood through the popular behavioural domain of drawing by requesting children to draw the single and mixed bipolar emotions of happiness and sadness.

Mixed emotion in children's drawings

Recently a selection of literal, content and abstract features has been found to vary by single or mixed emotion type (Burkitt & Sheppard, 2014; Burkitt & Watling, 2015). For example, red and blue were used in mixed happy and sad drawings of another child by 5-8-year-old children, while red was used in mixed emotion self-drawings (Burkitt & Sheppard, 2014). Children also tend to alter literal features when displaying mixed happiness and sadness by showing a frown, and often combine actions of figures with gifts and a frown rather than portraying clearly happy or sad actions (Burkitt & Watling, 2015). In freehand drawing tasks, children tend to use features in mixed emotion drawings that reflect those used in happy rather than sad or baseline drawings such as smiles and gift giving (Burkitt & Watling, 2015).

Where children have reported using a range of literal, content and abstract properties to portray single positive or negative affect, adult judgements of the features showing specific emotions are fairly accurate in relation to the children's explanations of their own depiction of emotion (Burkitt & Barrett, 2010; Malchiodi, 2012). However, as children can recognise and are able report mixed emotion in themselves

and in other people from approximately 6-7 years of age (e.g., Larsen, To & Fireman, 2007), can encode mixed emotions such as sadness and happiness in representations of human figures (Burkitt & Sheppard, 2014; Burkitt & Watling, 2015), and in light of the continued use of children's reports to inform analysis of affective depiction (Malchiodi, 2012), the question arises about how children and adults perceive drawing strategy use for single and mixed emotion in the same drawings. Previous research exploring concordance between children's reports and adult observations of strategy use to depict emotion (Burkitt & Barrett, 2010) only employed two coders and focused on depictions of single emotion.

Design considerations

Children's drawings of themselves and another child were analysed in the present study. This was because the precise use of drawing strategies has been found to vary not only by singular or mixed emotion type but by topic type. For example, children use more literal and content properties when drawing happy and sad houses than when drawing human figures (Picard, Brechet & Baldy, 2007). Children tend to include more actions and clothing detail to signal affect when depicting girls compared to boys (Burkitt & Newell, 2005) and tend to include more positive behaviours and facial details when drawing happy versions of themselves rather than another child (Burkitt & Watling, 2013), possibly reflecting their understanding of prosocial display rules in relation to positive impression management (Heyman, Fu & Lee, 2007). It is plausible to expect that children will report using drawing strategies in different ways when talking about drawings of themselves or another child.

The opposite valence emotion pairs of happiness and sadness were selected in the present study due to the relative ease at which children can recognise and report these emotions singly and as a blend (Heubeck et al., 2016), to explore the relevance of the evaluative space model of the possibility of behavioural evidence of the experience of bipolar opposite emotions, and to be comparable to related findings in the field which has primarily examined children's drawings of happy, sad and mixed emotions.

The present study included children across an age range from 6 to 8 years where they can recognise and report the possibility that the mixed emotions of happiness and sadness occur in other people with significant gains in this understanding around the age of 7 years (Larsen, To, & Fireman, 2007; Wintre & Vallance, 1994; Zajdel, Bloom, Fireman & Larsen, 2013). The children were grouped into two age groups around a year group boundary where significant increases in mixed emotion recognition and understanding are thought to occur approximately around the age of 7 years (Larsen, To & Fireman, 2007). The range includes the period around the ages of 6- 7 years where there appears a more consistent conceptual understanding that mixed emotions in others and self are possible (Donaldson & Westerman, 1986; Harter & Buddin, 1987; Harris, 2000; Larsen, To, & Fireman, 2007; Wintre & Vallance, 1994). The age range also encapsulates a period where children depict single and mixed experiences of sadness and happiness with some variation as a function of emotion type (Burkitt & Sheppard, 2014; Burkitt & Watling, 2015).

Hypotheses

Considering previous research (Burkitt & Barrett, 2010) which compared child reports and adult observations of drawing strategies for single happy and sad emotions,

it was anticipated that adults would observe similar drawing strategies to those reported by children across the single emotion drawings and speculated that there may be greater variation between adult and child reports for drawings of mixed emotion.

As indicated in Burkitt & Watling's (2015) study, where strategies used to depict mixed emotion were more akin to those used in happy rather than sad drawings, it was anticipated that child reports and adult observations of mixed emotion could be more similar to those reported and observed in happy rather than sad drawings.

In line with children's developing recognition and understanding of mixed emotion, it was expected that older children would report more mixed emotion drawing strategies and that adult codes of observed strategies would reflect this trend.

Based on previous research examining drawn differences between self-figures and those of another child (Burkitt & Watling, 2015), it was anticipated that children would report using drawing strategies differently when reporting on themselves or another child. It was also expected that adult codes would reflect these differences fairly accurately as adult reports of children's reported strategies for single emotion types have been found to be fairly concordant (Burkitt & Barrett, 2010). Possibly in relation to prosocial and self-presentational display rules, it was also anticipated that children may report more prosocial strategies when describing drawings of themselves than another child in happy and mixed emotion drawings.

Method

Participants

Participants were 205 children (104 boys, 101 girls) aged between 6 years 2 months and 8 year 3 months forming two age groups (6 years 2 months - 7 years 2 months and 7 years -3 months - 8 years - 3 months) across two conditions drawing either themselves (self: *n*= 103, 52 boys, 51 girls) or another gender matched child (other: *n* = 102, 52 boys, 50 girls). Children were recruited by age from three primary schools in the East and West Sussex, UK. They were allocated to one of the two conditions based on alterative appearance on class lists by gender.

Adult coders

Three adult coders coded the children's reported overall strategy use and specific allocation of drawings per strategy; a female experimenter, a female art teacher and, a female science teacher. They were recruited for use of drawing activities professionally and contrasting subject disciplines. The experimenter and the art teacher coded the drawings to separate the science teacher's coding of the reports from the art teacher's coding of the drawings. Holding the second rater (the experimenter) constant was intended to standardise coding and inter rater agreement observations and processes.

Materials

A4 white paper, 11 crayons (red, orange, yellow, green, blue, purple, pink, white, black, grey, brown) and lead pencils were used for the drawing tasks. A "smiley face" Likert scale was used to measure children's affect towards the figures in either the self or other condition (please see Figure 1) to assess whether the figures were viewed with the anticipated valence. A five-point Likert scale to assess teachers' judgements of children's drawing ability in relation to their year group was used to check homogeneity

of the sample in terms of drawing ability (please see Appendix A). Levene's testing confirmed the homogeneity of the sample within age groups and all children with personal and parental consent were included in the study. Brief vignettes describing single and mixed emotion shown to elicit anticipated emotional responses in self or another (Burkitt, 2016; Burkitt & Sheppard, 2014) were used (please see Appendix B).

INSERT FIGURE 1 ABOUT HERE

Procedure

Children were seen individually in a quiet area of their classroom or a quiet area within sight of their class teacher. They heard the same vignette phrased either about themselves or another gender matched child depending upon condition (please see Appendix B) describing events of single happy, sad and mixed valence. Following a protocol that elicits recognition of single and mixed emotions in lead characters (Burkitt & Sheppard, 2014; Larsen et al., 2007; Donaldson & Westerman, 1986), children were interviewed about emotional responses either about themselves or the protagonist to the vignette immediately after hearing it. Each child then completed the drawing tasks, drawing a baseline figure, and counterbalanced happy and sad versions of the lead figure. The mixed emotion drawings were requested only if children reported mixed emotion because of the condition appropriate vignette.

The instructions for the tasks in the self-condition were as follows. Children in the other condition received equivalent instructions concerning a gender matched child. The interview questions, drawing task and Likert rating scale instructions for the children in the condition drawing another child were the same except that self-

references throughout these measures were substituted for references to the child in the vignette.

Self-condition

Understanding of mixed emotions and drawing strategy. A female researcher interviewed children about their emotional responses to the vignette in each condition initially asking ‘‘How does the ending of the story make you feel?’’. If only one emotion was reported children were asked ‘‘Does the ending make you feel anything else?’’, and if a single emotion was not mentioned, the following question was asked, ‘‘Did the ending make you feel happy/sad?’’. They were asked to explain why they felt this way to check that the last events from the vignette elicited the emotion responses.

Drawing tasks. Children drew a baseline, followed by a happy and a sad drawing in counterbalanced order. They then completed a mixed emotion drawing if they had reported this experience occurring from the vignette. Each drawing was removed before the subsequent drawing task. The instructions for completion of each figure were as follows:

Baseline drawing task. “I’d like you to draw yourself. Use the pencil to draw, and colour in using one of these colours. Please draw yourself as well as you can and colour in as well as you can”.

Happy/Sad counterbalanced drawing tasks. “Now think about when you felt happy/sad when listening to this story. Please draw yourself remembering when you felt happy/sad because of the story. Use the pencil to draw, and colour in using one of these colours. Please draw yourself as well as you can and colour in as well as you can”.

Mixed emotion drawing task. "Now think about when you felt sad and happy [counterbalanced order of emotion terms] when listening to this story. Please draw yourself remembering when you felt sad and happy [counterbalanced order of emotion terms] during the story. Use the pencil to draw, and colour in using one of these colours. Please draw yourself as well as you can and colour in as well as you can".

Likert scale affect ratings. Immediately after the completion of each drawing, children completed a smiley face five-point Likert scale about how the character in the vignette (themselves or other child) felt to check differential affective responses. The instructions along with the experimenter pointing to the faces in the scale in order of right to left in the self-condition were as follows:

"I would like you to point to the face that shows how you feel. Here are the faces that you are going to be looking at (pointing to each in turn). The first one is a very sad face, the next one is sad, the next one is a bit sad, the middle one is just OK, the fourth one is a bit happy, the next one is happy and the last one is a very happy face. Which one do you feel most at the moment?"

Drawing strategy questions. Lastly, each affective drawing was placed separately in front of each child (in random order), and the following questions based on those in Burkitt & Barrett (2010) were asked:

"Tell me how you showed that you are happy."

"Tell me how you showed that you are sad."

"Tell me how you showed that you are sad and happy (counterbalanced emotion terms)."

Results

Preliminary analyses

Six children (4 boys and 2 girls) from the younger age group in the self-condition did not report the possibility of mixed emotions during the post vignette interview and their data was removed from subsequent categorisation and analyses (*N*=199).

To assess whether the children rated the anticipated affective responses towards the baseline, happy, sad and mixed emotion figures, the affect ratings for each drawing type (baseline, happy, sad and mixed) were submitted to a 2 (age group) x 2 (condition) x 4 (drawing type) mixed ANOVA, with drawing type entered as the repeated measure and the other factors as independent groups. A main effect of drawing type was found (F (2, 198) = 121.88, $p < 0.001$, $n_p^2 = 0.32$, $P = 1.00$). Planned comparisons ($p < 0.05$) showed that higher ratings were given to the happy ($M = 4.21$, $SD = 0.13$) figures than to both the baseline ($M = 3.13$, $SD = 0.17$), sad ($M = 1.02$, $SD = 0.03$) and mixed (M = 1.97, SD = 0.12) figures, and that the sad and mixed figures were rated significantly lower than the baseline topics. No other significant differences in the affect ratings were found.

To check that drawing ability was relatively similar across conditions, a 2 (age group) x 2 (condition) between-subjects ANOVA was conducted on the teachers' ratings of children's drawing abilities. No significant effects were found.

Data coding

Children's reports of how they showed that the figures were happy, sad, or mixed were analysed using exhaustive content analysis. The categories and instantiations of use of these categories by were not predetermined and were generated through an exhaustive coding procedure. The experimenter analysed the children's

verbal responses to identify categories of reported strategies. The process was repeated by a second rater, a female science teacher, who independently examined the children's reports. There was high (K=0.92) agreement between the categorical lists. The experimenter's list of mutually exclusive categories was then refined and used to classify each verbal response. The classification process was conducted independently by the experimenter and by a second independent judge who was a female art teacher. Inter-rater agreement for the classification of the verbal responses for each category is shown in Table 1.

INSERT TABLE 1 ABOUT HERE

The children's drawings were content analysed by the experimenter and the art teacher using this process to identify the categories of strategies they used in their drawings of single and mixed emotion figures to show that these figures differed from the neutral baseline figure. Very high overall agreement about the categories was obtained (K= 0.96). As shown in Table 1, the raters coded the same set of strategies verbally reported by the children. The two judges then independently classified all of the drawings. The levels of inter-rater agreement in are also shown in Table 1.

Children's reported and adult observed drawing strategies

The children's reports and the adult judgements of strategy use were analysed. The presence of a strategy was scored as 1, with the absence of the strategy scored as 0. Two sets of analyses were conducted; one on the children's verbal reports, and the other on the adults' judgements of the drawings. In each set of analyses, for each strategy individually, a 2 (age group) x 2 (condition: self vs. other) x 3 (drawing type: happy vs. sad vs. mixed) three-way mixed ANOVA was conducted, with drawing type entered as the repeated measure and the other two factors as independent groups. Whilst

categorical dependent variables are not usually analysed using ANOVA, it is well-established that ANOVA yields comparable robust outcomes when used to analyse categorical data which have been scored as 0s and 1s (Burkitt, 2016; Gabrielsson & Seeger, 1971; Greer & Dunlap, 1997; Lunney, 1970; Picard, Brechet & Baldy, 2007). The results of the two sets of analyses were as follows.

Clothing details: Child reported. A main effect for drawing type (F (1, 198) = 101.39, $p < 0.001$, $np^2 = 0.35$, $P = 1.00$) was found. *Post hoc* paired t-tests ($p< 0.05$) showed that significantly more use was reported in the sad ($M = 0.65$, $SD = 0.15$) than in the happy ($M = 0.47$, $SD = 0.18$) and mixed ($M= 0.41$, $SD =0.15$). A main effect was also found for age group (F (1, 198) = 09.33, $p < 0.001$, $np^2 = 0.19$, $P = 0.99$) with more reported use in the older age group ($M = 0.38$, $SD = 0.13$) than younger age group ($M = 0.16$. $SD = 0.09$). There were no other significant effects.

Clothing details: Adult observed. A main effect for drawing type (F (1, 198) = 29.24, $p < 0.001$, $np^2 = 0.11$, $P = 1.00$) was found with *post hoc* paired t-tests ($p<0.05$) showing more clothing detail observed in the sad drawings ($M = 0.66$, $SD = 0.16$) than in the happy ($M = 0.56$, $SD = 0.14$) and mixed ($M = 0.55$, $SD = 0.16$) ones. A main effect was also found for age group (F (1, 199) = 9.01, $p < 0.05$, $np^2 = 0.18$, $P = 0.96$), with more use observed in the older ($M =0.32$, $SD = 0.07$) than younger group ($M = 0.14$, $SD = 0.05$). No other significant effects were found.

Smile: Child reported. A main effect was found for drawing type (F (1, 198) = 18.24, $p < 0.001$, $np^2 = 0.32$, $P = 1.00$), with *post hoc* paired t-tests ($p<0.05$) showing more reported use in the happy ($M= 0.88$, $SD = 0.15$) than the mixed ($M = 0.54$, $SD = 0.12$) and sad drawings ($M = 0.11$, $SD= 0.02$), and more in the mixed than sad drawings. There were no further significant effects.

Smile: Adult observed. A main effect for drawing type (F (1, 198) = 20.17, p < 0.001, np^2 = 0.30, P = 1.00) was found, with *post hoc* paired t-tests (p<0.05) showing more reported use in the happy (M= 0.88, SD = 0.14) than the mixed (M = 0.62, SD = 0.12) and sad drawings (M = 0.15, SD= 0.05), and more in the mixed than sad drawings. There were no further significant effects.

Frown: Child reported. A main effect was found for drawing type (F (1, 198) = 30.29, p < 0.001, np^2 = 0.24, P = 1.00), with *post hoc* paired t-tests (p<0.05) showing more reported use in the sad (M= 0.33, SD = 0.13) than the happy (M = 0.03, SD = 0.08) and mixed drawings (M = 0.19, SD= 0.15), and more in the mixed than happy drawings.

Frown: Adult observed. A main effect for drawing type (F (1, 198) = 30.29, p < 0.001, np^2 = 0.24, P = 1.00) was found, with *post hoc* paired t-tests (p<0.05) showing more reported use in the sad (M= 0.36, SD = 0.05) than the happy (M = 0.07, SD = 0.07) and mixed drawings (M = 0.24, SD= 0.08), and more in the mixed than happy drawings. A main effect for condition was found (F (1, 199) = 18.91, p < 0.001, np^2 = 0.18, P = 0.90) with greater used observed in the other (M= 0.28, SD = 0.12) than the self (M= 0.12, SD = 0.10) condition. There were no further significant effects.

Confused face: Child reported. A main effect emerged for drawing type (F (1, 198) = 18.08, p < 0.05, np^2 = 0.19, P = 1.00), with *post hoc* paired t-tests (p<0.05) showing more reported use in the mixed (M= 0.43, SD = 0.19) and sad (M = 0.24, SD= 0.18) than the happy (M = 0.04, SD = 0.01). There were no other significant effects.

Confused face: Adult observed. A main effect was found for drawing type (F (1, 198) = 17.09, p < 0.05, np^2 = 0.19, P = 1.00), with *post hoc* paired t-tests (p<0.05) showing more reported use in the mixed (M= 0.40, SD = 0.18) and sad (M = 0.34, SD=

0.14) than the happy drawings (*M* = 0.07, *SD* = 0.01). There were no other significant effects.

Gift giving: Child reported. A main effect for drawing type (*F* (1, 198) = 21.04, $p < 0.05$, $np^2 = 0.21$, *P* = 1.00) emerged, with *post hoc* paired t-tests ($p<0.05$) showing more reported use in the happy (*M*= 0.28, *SD* = 0.18) than the sad (*M* = 0.04, *SD* = 0.01) and mixed drawings (*M* = 0.03, *SD*= 0.02). A main effect for condition was found (*F* (1, 198) = 13.17, p<0.001, $np^2 = 0.23$, *P* = 0.80), with more reported use in the self (*M* = 0.14, *SD* = 0. 11) than other (*M* =0. 04, *SD* = 0.03) condition. There were no other significant effects.

Gift giving: Adult observed. A main effect for drawing type (*F* (1, 198) = 19.94, $p < 0.05$, $np^2 = 0.22$, *P* = 1.00) was found, with *post hoc* paired t-tests ($p<0.05$) showing more reported use in the happy (*M*= 0.36, *SD* = 0.16) than the sad (*M* = 0.07, *SD* = 0.01) and mixed drawings (*M* = 0.06, *SD*= 0.03). A main effect for condition was found (*F* (1, 197) = 16.03, p<0.001, $np^2 = 0.21$, *P* =0.81), with more reported use in the self (*M* = 0.12, *SD* = 0. 10) than other (*M* =0.07, *SD* = 0.03) condition. There were no other significant effects.

Actions: Child reported. A main effect was found for drawing type (*F* (2, 198) =13.83, $p < 0.001$, $np^2 = 0.17$, *P* = 0.9), with *post hoc* paired t-tests ($p<0.05$) showing more reported use in the happy (*M* = 0.43, *SD* =0.17) than sad (*M* = 0.25, *SD* = 0.11) or mixed drawings (*M* = 0.25, *SD* = 0.09). A main effect was found for condition, (*F* (1, 198) = 10.01, $p < 0.05$, $np^2 = 0.26$, *P* = 0.89), with more reported use in the self (*M*= 0.05, *SD* = 0.03) than the other (*M*= 0.10, *SD* = 0. 07) condition. No other significant effects were found.

Actions: Adult observed. A main effect was uncovered for drawing type (F (2, 189) =13.83, $p < 0.001$, $np^2 = 0.17$, $P = 0.9$), with *post hoc* paired t-tests ($p<0.05$) showing more use observed in the happy ($M = 0.41$, SD =0.16) than sad ($M = 0.32$, SD = 0.12) or mixed drawings ($M = 0.32$, $SD = 0.10$). There were no other significant effects.

Line use: Child reported. A main effect for drawing type (F (2, 198) = 19.03, $p < 0.001$, $np^2 = 0.13$, $P = 0.97$) emerged. *Post hoc* paired t-tests ($p<0.05$) showed that more line use was reported by children for the sad ($M = 0.24$, $SD = 0.09$) and mixed ($M = 0.20$, $SD = 0.06$) than the happy ($M = 0.13$, $SD = 0.07$) drawings and no other significant effects were found.

Line use: Adult observed. A main effect for drawing type (F (2, 198) = 20.71, $p < 0.01$, $np^2 = 0.20$, $P = 0.98$) was found, with *post hoc* paired t-tests ($p<0.05$) showing more use observed in the sad drawings ($M = 0.25$, $SD = 0.09$) compared with the happy ($M = 0.16$, $SD = 0.04$) and mixed drawings ($M = 0.15$, $SD = 0.08$). There were no additional significant effects.

Colour change: Child reported. A main effect for drawing type was uncovered (F (2, 198) = 18.32, $p < 0.01$, $np^2 = 0.24$, $P = 0.98$), with *post hoc* paired t-tests ($p<0.05$) indicating more reported use in the happy (M= 0.46, SD =0.19) and mixed ($M = 0.41$, $SD = 0.14$) than the sad drawings (M =0.19, $SD = 0.12$). No other significant main or interaction effects were found.

Colour change: Adult observed. A main effect for drawing type (F (2, 198) = 19.44, $p < 0.01$, $np^2 = 0.20$, $P = 0.31$, $P = 0.99$) was found, with *post hoc* paired t-tests ($p<0.05$) indicating more use in the happy (M= 0.47, SD =0.17) and mixed ($M = 0.43$,

SD = 0.15) rather than the sad drawings (*M* =0.21, *SD* = 0.12). No other significant main or interaction effects were found.

Weather: Child reported. A main effect for drawing type (F (2, 198) = 15.44, $p < 0.01$, $np^2 = 0.33$, $P = 0.98$) was found with *post hoc* paired t-tests ($p<0.05$) indicating more reported use in the happy (*M*= 0.18, *SD* =0.11) and mixed (*M* = 0.14, *SD* = 0.13) rather than the sad drawings (*M* =0.07, *SD* = 0.05). No other significant main or interaction effects were found.

Weather: Adult reported. A main effect for drawing type emerged (F (2, 198) = 18.14, $p < 0.01$, $np^2 = 0.30$, $P = 0.98$), with *post hoc* paired t-tests ($p<0.05$) indicating more reported use in the happy (*M*= 0.19, *SD* =0.04) and mixed (*M* = 0.14, *SD* = 0.05) rather than the sad drawings (*M* =0.07, *SD* = 0.06). No other significant main or interaction effects were found.

Mutations: Child reported. There was a main effect of drawing type (*F* (2, 198) = 31.03, $p < 0.001$, $np^2 = 0.19$, $P = 1.00$), with *post hoc* paired t-tests ($p<0.05$) indicating children reporting more use in the sad (*M* = 0.14, *SD* = 0.02) and mixed (*M* = 0.15, *SD* = 0.03) drawings than in the happy (*M* = 0.05, *SD* = 0.02) drawings. A main effect of age group emerged (*F* (1, 198) = 10.89, $p <0.001$, $np^2 = 0.18$, *P*= 0.89), with more used reported by the older (*M* = 0.07, *SD* = 0.02) than younger (*M* = 0.04, *SD* = 0. 03) age group. There were no other significant effects.

Mutations: Adult observed. A main effect of drawing type (*F* (2, 198) = 33.07, $p < 0.001$, $np^2 = 0.19$, $P = 1.00$) emerged, with *post hoc* paired t-tests ($p<0.05$) indicating more observed use in the sad (*M* = 0.17, *SD* = 0.05) and mixed (*M* = 0.20, *SD* = 0.04) than in the happy (*M* = 0.08, *SD* = 0.02) drawings. A main effect of age group emerged (*F* (1, 197) = 15.02, $p <0.001$, $np^2 = 0.13$, *P*= 0.92), with more used reported by the

older (*M* = 0.09, *SD* = 0.06) than younger (*M* = 0.05, *SD* = 0. 02) age group. There were no other significant effects.

Words: Child reported. A main effect of condition was found (*F* (1, 197) = 10.15, *p* = 0.04, np^2= 0.19, *P* =0.89) with greater use reported in the other (*M* = 0.15, *SD* = 0.03) than self (*M* = 0.06, *SD* =0.01) condition.

Words: Adult observed. A main effect of condition (*F* (1, 197) = 12.09, *p* = 0.04, np^2= 0.14, *P* =0.81) was found, with greater use reported in the other (*M* = 0.13, *SD* = 0.02) than self (*M* = 0. 06), *SD* =0.02) condition.

Characterisations: Child reported. A main effect was found for drawing type (*F* (2, 198, = 15.76, *p* = 0.02, np^2= 0.17, *P* =0.88), with *post hoc* paired t-tests (*p*<0.05) indicating more reported use in the happy (*M* = 0.18, *SD* = 0.03) and mixed (*M* =0.11, *SD* = 0.02) than the sad (*M*= 0.07, SD =0.01) drawings. A main effect of condition was found (*F* (1, 197) = 10.03, *p* = 0.04, np^2= 0.19, *P* =0.82) with greater use reported in the other (*M* = 0.09, *SD* = 0.02) than the self (*M* = 0. 02, *SD* =0.03) condition.

Characterisations: Adult observed use. A main effect was found for drawing type (*F* (2, 198, = 12.13, *p* = 0.02, np^2= 0.13, *P* =0.82), with *post hoc* paired t-tests (*p*<0.05) indicating more reported use in the happy (*M* = 0.17, *SD* = 0.03) and mixed (*M* =0.10, *SD* = 0.03) than the sad (*M*= 0.08, SD =0.01) drawings. A main effect of condition was found (*F* (1, 197) = 15.03, *p* = 0.03, np^2= 0.14, *P* =0.81) with greater use reported in the other (*M* = 0.10, *SD* = 0.03) than the self (*M* = 0. 03, *SD* =0.03) condition.

Figure 2 shows an example of a happy and a mixed emotion figure of another child drawn by the same boy. The child reported and the adults coded the categories of waving and smiling for the happy figure, and the child reported stripy clothes for the

mixed emotion figure with the adults coding the categories of clothing details and action for the same figure.

INSERT FIGURE 2 ABOUT HERE

Figure 3 illustrates a baseline and a mixed emotion self figure drawn by the same girl. The child and adults reported the action of thinking of people and smiling for the baseline drawing. The child reported frowns, words and action for the mixed emotion drawing, whereas adult coders reported frowns and the action of thinking for the mixed emotion drawing.

INSERT FIGURE 3 ABOUT HERE

The pattern of ANOVA results shows that adults observed a very similar pattern of use across all strategies as reported by the children. In summary, there were some differences between reported and observed strategies by drawing type, age, and condition. More use of frowns was noted by adults in the other condition which was not reported by the children and more use of actions was reported by children that were not noted by the adults. There was more reported use of lines by the children in the mixed emotion drawings that was not noted by the adults. Table 2 shows where the strategies were used the most, as indicated by the ANOVA procedures, for specific emotion types compared to other emotion types for child reported and adult observed use. The strategy of word use is not included in Table 2 as no main effects of emotion type for reported or observed use were found.

INSERT TABLE 2 ABOUT HERE

To assess how children's verbal reports related to the adult observed strategies, a series of χ^2 analyses was conducted. In summary (please see Table 2A), all of the

children's verbal response categories were significantly related to the adults' observations for each category. In a few instances, there were higher discrepancies between children's reported and adult observed use (Cohen's Kappa < 0.7) such as the category of confused faces in the sad drawings, gift giving for all drawing types, line use in the happy and mixed drawings and mutations in the mixed drawings. In all cases adults observed slightly more strategy use than the children reported except for line use for mixed emotion drawings where children reported more use than was observed by adults.

Two additional series of χ^2 analyses were also conducted for both age groups independently to examine any impact of the children's age on the relationship between the child reports and adult observations. Almost identical results were obtained for both age groups. There was a significant level of association between the child reports and the adult observations across drawing type, strategy and condition.

Discussion

Previous research has shown that children can report features used in relation to single positive and negative emotions and that adults are reliable judges of strategy use as indexed by high agreement with children's reported strategy use (Berti & Freeman, 1997; Burkitt & Barrett, 2010). The present findings extend this research showing that children can report strategies they used to indicate mixed emotion in drawings of themselves or another child and that adults decode the mixed as well as single drawing strategies in predominantly accurate ways as reported by the children. In terms of the framework theory of art, the present findings illustrate primarily concordant relations between the child artists reported strategies and those perceived by the beholding adults.

The strategies are like the range of literal, content and select abstract features for positive and negative human figures observed in related research (e.g., Burkitt, 2016; Burkitt & Watling, 2015; Brechet & Jolley, 2014; Ives, 1984; Jolley, Fenn & Jones, 2004: Parsons, 1987; Picard, Brechet & Baldy, 2007; Winston, Stewardson & Lepine, 1995). Children reported using, and were observed to use, a range of literal, such as facial expressions, content based, such as good or bad weather and characterised figures, and abstract features, such as colour alterations and line use differentially from baseline drawings in response to single and mixed emotion experiences in both conditions. Children could access verbal reports for the entire range of strategies supporting Berti and Freeman (1997) claim that children can flexibly verbalise on alterations in graphic routine to some extent in this age range.

In support of the inconsistency of size alterations either with increases in positive figures size or decreases in negative figures size, size changes were not observed or reported (e.g., Joiner, Barnett & Schmitt, 1996; Thomas & Jolley, 1998) indicating that this strategy may not be chosen when children can select from other drawings strategies. Likewise, when children can choose single or multiple colours in an unrestricted way, although colour change was reported and observed from baseline colour selection (Burkitt, 2008; Burkitt & Sheppard, 2014), alterations of specific colours were neither reported nor observed in relation to emotion type or colour preferences (e.g., Burkitt, 2008; Crawford et al., 2012; Picard & Lebaz, 2010).

Of key interest for the aims of this study, is the range of features reported and observed in the mixed emotion drawings which extend the examination of how children may alter drawings of figures experiencing mixed emotion from baseline figures (Burkitt & Watling, 2015). Clothing details, smiles, frowns, confused faces, gift giving,

other actions, line use, weather, colour changes, mutation and characterisations were all reported to some extent in the mixed emotion drawings displaying alterations in features in affect appropriate ways. Unlike past research (Burkitt & Watling, 2015), confused faces were used significantly more in mixed and sad drawings suggesting that the subjective experience of these emotions may have been understood to be more akin to a negative rather than a positive experience by children. Indeed, the affect ratings about themselves or another child showed that mixed emotions were rated more closely to sad than happy drawings suggesting that this affective view may have translated into the closeness of depictions of sad and mixed feelings for these strategies. It might be the case that these children sometimes struggle to understand mixed emotional experiences in themselves and in others (Harris, 1994; 2000; Heubeck et al., 2015) and that this difficulty is reflected in the portrayal of confused figures.

As anticipated, there was some evidence of an age-related increase in the use of the content devices of altering clothing details and using mutations overall. However, these developmental trends were not related to emotion type and could reflect a commonly observed age related developmental increase in detail and figure alterations (e.g., Cox, 1992; 2005; Ives, 1984; Malchiodi, 2012; Parsons, 1987; Picard & Gauthier, 2014).

As expected, there were features that were observed to be used differently depending on whether children were drawing themselves or another child. The only strategy that was not reported or observed to be used differentially across single or mixed emotion drawings was the use of words in speech bubbles which was only reported and observed to a greater extent in children's drawings of another child. This condition difference may be a result of children resorting to commonly understood

symbols of speech (Angell, Alexander & Hunt, 2014) to depict other people's displays of emotion. Frowning was observed by adults to be used more frequently where children drew another child rather than themselves. This outward signifier of negative emotion may be more readily identified by children in another person rather than in themselves (Harris, 2000) and observed as a straightforward sign by adult observers of a negative emotion. It may be the case that children did not want to report themselves frowning due to an awareness of social display rules, for example, an understanding that reporting negative information about themselves may create an unfavourable impression of them (Gnepp & Hess, 1986; Watling & Banerjee, 2012). They may not have had similar self-protective reservations about self -presentational behaviour when reporting representational strategies about another child (Watling & Banerjee, 2012).

Children reported more gift giving and additional actions such as waving in self rather than other drawings. This too could reflect children's impression management and emerging prosocial self-protective or self-promotional display rules and desire for others to approve of their actions (Tyler & Feldman, 2005). Figures were characterised more in children's drawings of another child and this was reported by both children and adults. Common characterisations such as super heroes or burglars are arguably readily recognised for affective properties such as moral character (e.g., Björkqvist & Lagerspetz, 2007) and may represent a way that children can report themselves negatively or positively without inviting direct judgement about their own experiences or behaviours.

A main aim of the present study was to extend enquiry (Burkitt & Barrett, 2010) that examined the relationship between children's reports and adult's observed affective feature use for single positive and negative human figure drawings. The present findings

demonstrate that adults are very reliable judges of single emotions in children's drawings and determine a very similar pattern of feature use as reported by the children for mixed emotion drawings. The pattern of results shows that children reported similar use across all these strategies as observed by adults. There were some minor differences between reported and observed strategies by drawing type in addition to those by age and condition mentioned above. Children reported more alterations of line use such as heavy, messy or neat lines than observed by adults in the mixed emotion drawings. This is a subtle drawing device and could be overlooked by viewers. It could also be that line use was taken by adults and as an indicator of care taken over the drawing (Burkitt, Jolley & Rose, 2010) rather than a device to portray affect in some instances.

The levels of discrepancy between the children's reports and the adults' observations were slightly higher in a few than in the other cases. Confused faces in the sad drawings, gift giving for all drawing types, line use in the happy and mixed drawings and mutations in the mixed drawings had slightly lower reliability values. In all cases, adults observed slightly more strategy use than the children reported with the exception of line use for mixed emotion drawings where children reported more use than was observed by adults. It could be that some strategies are harder to verbalise (Dreissnack, 2005; Harris, 1994, 2000; Saarni, 1999) in relation to specific emotional experiences or indeed that the adult judges are using different information to base their observations on. It would be worthwhile for future research to examine adult coders' reasons for their observations and ascertain their values about the expressive role of drawing. This would allow consideration of subjective social and cultural factors and that can influence the interpretation of expressivity in drawing (Bullot & Reber, 2013; Hallam, Lee & Das Gupta, 2012, 2014; Haanstra, Damen & van Hoorn, 2011).

Except for frowning figures, confused faces and mutations, the mixed emotion strategies were more similar to those used in happy rather than sad drawings including line use (for adults), colour change, weather, and characterisations. One possibility is that the positive emotion is more salient to children in the mixed emotion experience. Examining the type of subjective experience of mixed emotion (Burkitt & Fotheringham, 2016; Carrera & Oceja, 2007) could assess the impact of the type of sequential or simultaneous experience on children's drawings. It would also be valuable to see if social display motivations and cultural norms mediate children's choice of drawing strategies to convey more positive than negative emotion (Harris, 2000; Heyman, Fu & Lee, 2007; Tyler & Feldman, 2000). Children's ability to report on bipolar opposite emotions offers support for the evaluative space model in this age range and future work assessing the simultaneity of the reported experiences could serve to assess the precise applicability of the evaluative space versus the circumplex adult models of mixed emotion in childhood.

Limitations

The present study employed a small range of adult coders and additional coders may perceive differences in the use of drawings strategies depending upon their artistic experience and values. Whilst the experimenter in the present study was a constant rater in the coding process, and inter rater reliability across the categorisation and instantiation of strategy use by drawing type processes was very high, different pairs of coders with varying perceptions and experience with the drawing process could extend the findings. The range of emotion terms could be extended to examine depictions of more closely related emotions such as anger and fear to assess more subtle combinations of emotion pairs and adult's ability to decode such pairs in relation to

reported strategy use. The age range in the present study encapsulated a time when children are already aware of mixed emotions yet researching younger children could shed light on different abilities to report and depict simple and more complex emotions. In addition, the gender matched other child employed in the present study was loosely specified and characteristics of the protagonist in the other condition could be extended to include children or adults with a specified relationship to the child as children tend to draw emotive information about known social agents.

Whilst the reports in the present study were not a measure of graphic intentions as such, their self-reported drawing strategy use could be extended to examine drawing intentions before, during and after the drawing process as children's art work is often interpreted without reference to their graphic intentions.

The post drawing interviews and affect rating scales indicated that the figures were regarded differentially in affect appropriate ways yet the question remains whether the desired emotions were felt during the drawing process. Detailed observations of children's affect based utterances and behaviours during the drawing process could shed light on this question.

Overall, children across the two age groups could recognise and report mixed emotional experiences in both themselves and another child resulting from the vignettes as expected in this age range (Burkitt & Watling, 2015; Harris, 2000; Heubeck et al., 2016; Larsen et al., 2007; Wintre & Vallance, 1994). Children accessed verbal reports for the entire range of strategies supporting Berti and Freeman (1997) claims that children can flexibly verbalise on alterations in graphic routine to some extent from 5 years of age. The present research explored one relational link in the framework theory of art (Freeman, 1995), namely how children report displaying single and mixed

emotion and how the beholder, namely the adult viewers, perceive the same behaviour. Future research could focus on examining the mechanisms that might mediate this relationship by gathering more measures, such as metacognitive ability and level of theory of mind of the child, as well as the views of the onlookers towards drawings to better understand what the children think the viewers will think about their drawings and the expectations and experience the viewers may have about children's expressive drawings.

Whilst the present findings indicate that adults are very good decoders of single and mixed emotion in children's drawings, the slight variations in reported and observed strategies by emotion type indicate, in accordance with the cue dependency model of drawing (Freeman, 1980), that the precise cues in the drawings situation be elucidated as far as possible to inform interpretation of affect in children's drawings. It could be suggested that affective interpretation in applied as well as research contexts involves talking with children about their graphic choices (Coates & Coates, 2006; Cox, 2005) allowing for the possibility that more than one emotion is being represented in a single drawing or a single figure and interview children about their drawings accordingly.

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Appendix A

Teacher Likert rating scale for children's drawing ability

"Please indicate (name's) level of drawing ability relative to their year group on the following scale"

1	2	3	4	5
Much lower	Lower	Similar	Higher	Much higher

Appendix B

Vignettes for self and other conditions

Self*:* Please imagine that you have just moved to a new town with your family. You used to live in a small village where you had a very close friend. You went to the local village school which you loved. You went everywhere together and loved to play games together. But now you have moved far away from everything you loved. You did not know anyone to play with for a long time. Yet after a while you made a new friend at the new village school. You go everywhere together and most of all you love to play games together. One evening you think a lot about your old friend where you lived before and your new friend where you live now from school.

Other*:* Please imagine that boy /girl has just moved to a new town with their family. He/she used to live in a small village where they had a very close friend. The boy/girl went to the local village school which they loved. They went everywhere together and loved to play games together. But now he/she has moved far away from everything that they loved. He/she did not know anyone to play with for a long time. Yet after a while he/she has made a new friend at the new village school. They go everywhere together and most of all they love to play games together. One evening he/she thinks a lot about the old friend where they lived before and their new friend where they live now from school.

Appendix C

TABLE 2A:

Frequencies with which each strategy was reported by the child and observed by the adult judges, broken down by drawing type, with associated statistics showing the level of agreement between the child reports and the adult judgements.

Strategy	*Drawing type*	*Reported by Child*	*Not observed by adult*	*Observed by adult*	χ^2 *(df = 1), p<0.05*	*Cohen's kappa*
Clothing	Happy	*No*	30	75	5.51	0.74
		Yes	15	79		
	Sad	*No*	45	35	6.19	0.91
		Yes	39	80		
	Mixed	*No*	37	71	6.29	0.80
		Yes	32	59		
Smile	Happy	*No*	7	5	64.46	0.91
		Yes	4	173		
	Sad	*No*	168	10	117.84	0.89
		Yes	1	20		

	Mixed	*No*	68	21	106.02	0.84
		Yes	6	104		
Frown	Happy	*No*	191	1	144.43	0.93
		Yes	1	6		
	Sad	*No*	124	9	146.06	0.92
		Yes	4	62		
	Mixed	*No*	144	17	84.72	0.85
		Yes	7	31		
Confused face	Happy	*No*	186	5	97.63	0.71
		Yes	1	7		
	Sad	*No*	132	23	101.27	0.69
		Yes	2	42		
	Mixed	*No*	101	11	145.25	0.70
		Yes	18	69		
Gift giving	Happy	*No*	127	16	137.46	0.67
		Yes	0	56		

	Sad	*No*	181	10	36.13	0.68
		Yes	3	5		
	Mixed	*No*	185	8	40.14	0.68
		Yes	2	4		
Actions	Happy	*No*	108	5	149.50	0.82
		Yes	8	78		
	Sad	*No*	129	20	108.84	0.77
		Yes	3	47		
	Mixed	*No*	135	13	144.65	0.71
		Yes	0	51		
Line use	Happy	*No*	167	4	170.05	0.67
		Yes	0	28		
	Sad	*No*	145	6	154.02	0.82
		Yes	3	45		
	Mixed	*No*	152	0	151.48	0.67
		Yes	8	39		

Colour change	Happy	*No*	105	2	191.13	0.86
		Yes	0	92		
	Sad	*No*	149	12	122.12	0.79
		Yes	3	35		
	Mixed	*No*	115	3	151.48	0.83
		Yes	0	81		
Weather	Happy	*No*	159	4	168.07	0.73
		Yes	1	35		
	Sad	*No*	182	2	32.06	0.78
		Yes	3	12		
	Mixed	*No*	166	1	182.26	0.81
		Yes	0	29		
Mutation	Happy	*No*	183	7	107.81	0.87
		Yes	0	9		
	Sad	*No*	163	10	119.46	0.72
		Yes	2	24		

	Mixed	*No*	158	11	128.95	0.69
		Yes	1	29		
Word use	Happy	*No*	152	0	199.00	0.92
		Yes	0	47		
	Sad	*No*	145	0	193.98	0.77
		Yes	1	53		
	Mixed	*No*	166	2	208.23	0.79
		Yes	0	51		
Character isations	Happy	*No*	158	5	118.98	0.82
		Yes	8	28		
	Sad	*No*	180	2	126.73	0.72
		Yes	4	13		
	Mixed	*No*	170	9	18.99	0.78
		Yes	2	18		

The table extended by age group and condition can be made available on request from the authors

Tables and Figures

Table 1:

The defined strategies verbally reported by children, and the strategies that were identified by the adult raters from the children's drawings, together with the levels of inter-judge agreement in the allocation of each verbal response and each drawing to each category.

Strategy	*Kappa inter-rater agreement on child reports*	*Kappa inter-rater agreement on drawings*
Clothing detail: Inclusion of core clothing features such as a happy or sad symbol on a t-shirt or a hat	.91	.94
Smile: The presence of a smile	.96	.94
Frown: The presence of a of a frown	.96	.95

Confused face: Indicated by wavy mouth and downward eyebrow shape and placement	.89	.92
Gift giving: The figure holding a gift such as flowers or a box	.90	.93
Actions: Actions such as running, jumping, waving	.91	.95
Line use: Elements had been drawn lightly, heavily, neatly, or messily.	.79	.82
Colour change from colour used in baseline	.76	.89
Weather: Alterations such as a sun, rain or storm clouds	.91	.93
Mutations: Exaggeration or	.97	.96

additions of features such as long toe nails or two heads		
Words: Inclusion of speech bubbles or hanging words	1.0	1.0
Characterisations: Use of types such as superheroes or burglars	.84	.91

Table 2:

Most use by emotion type of drawing strategies for child reported and adult observed use

	Child reported			Adult observed		
Drawing Type	Happy	Sad	Mixed	Happy	Sad	Mixed
Clothing details		X			X	
Smile	X			X		
Frown		X			X	
Confused face		X	X		X	X
Gift giving	X			X		
Actions	X			X		
Line Use		X	X		X	
Colour change	X		X	X		X
Weather	X		X	X		X
Mutations		X	X		X	X
Characteri-sations	X		X	X		X

X denotes where the drawing strategy was used significantly more as indicated by ANOVA procedures for specific emotion types compared to other emotion types. Two X's appearing in one row signifies that use was significantly greater for two emotion types compared to the remaining one.

Figure 1:

Likert scale used to ascertain children's affect toward the drawn figures

Figure 2:

A happy and a mixed emotion figure of another boy drawn by a 6 year 7 month old boy

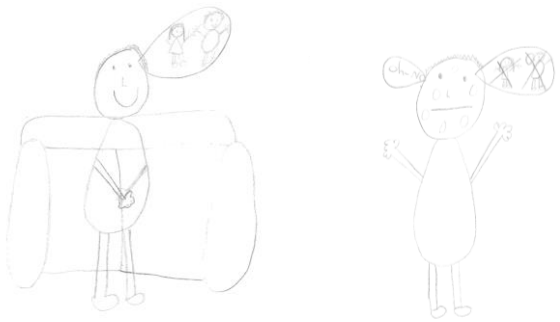

Figure 3:

A baseline and a mixed emotion self drawing by a 6 year 5 month old girl