Computers & Education 125 (2018) 458–464

Contents lists available at ScienceDirect

Computers & Education

journal homepage: www.elsevier.com/locate/compedu

Investigating social vulnerability in children using computer mediated role-play

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ARTICLE INFO

Keywords:
Social vulnerability
Computer role-play
Disinhibited social engagement
Technologies for children
Theory of mind

ABSTRACT

Here, we report a study using computer role-play to investigate Disinhibited Social Engagement in 54 typically developing children aged 6, 8 and 10 years. Children completed 22 (theme-matched) vignettes and computerised scenarios that captured the themes of the specific symptoms of Disinhibited Social Engagement Disorder (DSM V, APA, 2013). Our newly created 22 "Paper pencil" vignettes and computer role-play scenarios were used in conjunction with the Strange Stories (O'Hare, Bremner, Nash, Happé & Pettigrew, 2009) and Parents and Teachers completed versions of the Relationship Problems Questionnaire (RPQ: Minnis et al., 2007). Our findings revealed the developmental (age) differences of social vulnerability/indiscriminate friendliness and potential advantages of computermediated role-play in comparison to “paper pencil” tasks. We argue that using a method of children role playing characters gives a better insight into children's true vulnerabilities. We discuss our findings in relation to using this methodology for clinicians and researchers to improve social skills in the most socially vulnerable children.

1. Introduction

Child friendly software applications are now commonplace. As well as providing learning and entertainment, they have opened an exciting avenue for research to help children with social and cognitive difficulties via intervention and clinical assessment. Research in this field tends to integrate computer technology with real world-based activities, as a means to carry out research with children in a safe, controlled and ethical environment.

The most popular areas of research in this area tend to be interventions to improve social skills, cognitive skills, and learning (Beals, 2016; Vannini et al., 2011; Wass & Porayska-Pomsta, 2013). By contrast, our research reported in this paper uses this technology for psychological and behavioural assessment in children. Clinicians who assess children who are diagnosed with developmental disorders and/or whom display problem behaviours, report that children often do not present their problem behaviours in the clinic. Indeed, these children can give socially appropriate answers when questioned, but do not conduct themselves in a “socially desirable” manner in the real world (Minnis et al., 2010). Certainly, some children can be very socially aware, particularly if they have experienced a difficult upbringing; while others may not have the verbal sophistication required to describe their experiences in an interview, questionnaire or person-centered role-play task (Minnis et al., 2010). Therefore, accurately assessing social behaviours in children can be difficult. So, there is a need for measurement tools that are more representative of real life environments that can be reliably and consistently administered by researchers and clinicians alike, in a manner that children can engage

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https://doi.org/10.1016/j.compedu.2018.06.027
Received 6 October 2017; Received in revised form 11 April 2018; Accepted 29 June 2018
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with. At the same time as this need for appropriate assessment, there is a burgeoning interest in serious gaming. Here, video game elements are used in nongaming systems to improve user experience and engagement, at face value these can be perceived to be games for entertainment, but in the development of serious games the designers will have disguised an education or training purpose (Stokes, 2005; Vannini et al., 2011).

Although the measures used in this reported study can be used as a general measure of social vulnerability in middle childhood, they were initially created with a more extreme clinical population of vulnerable children in mind (in order to capture the nature of vulnerable behaviours more accurately), specifically, Disinhibited Social Engagement (DSE or indiscriminate friendliness IF) is a highly prevalent trauma and stressor related disorder. Described in the DSM-V, (APA, 2013) as a pattern of behaviour in which a child actively approached and interacts with unfamiliar adults, DSE is a tendency to be unduly affectionate and disinhibited towards others. This can result from or leave children vulnerable to child abduction and/or abuse, which are among the most common offenses committed against children. Currently, our knowledge on children's' disinhibited social behaviour is largely derived from observational and qualitative research (Bennett, Espie, Duncan, & Minnis, 2009; Bruce, Tarullo, & Gunnar, 2009; Lawler, Hostinar, Mliner, & Gunnar, 2014). This research generally focuses on DSE in infants and adolescents because measuring this level of social behaviour accurately in middle childhood has proved challenging for both clinicians and researchers (Minnis, Read, Connolly, Burston, Schumm, Putter-Lareman & Green, 2010).

Until 2013, DSE was classified as a sub-type of reactivate attachment disorder (RAD). Therefore, questionnaire measures of DSE/IF tend to be a sub-scale in measures of RAD. For example, Millward et al. (2006), Minnis, Rabe-Hesketh, and Wolkind (2002), & Minnis et al. (2007) assessed RDA & DSE behaviours using the relationships problems questionnaire, which are parent and teacher checklists for RDA that includes a sub-scale measure of DSE/IF. This measure is widely used to assess children's DSE/IF behaviors in research and clinical settings. However, this questionnaire does not give the clinician or the researcher the ability to witness the child's behaviors. So, there is much need for measures that focuses on the 'real world' DSE/IF behaviors in middle childhood. We employed the RPQ as an additional measure of DSE/IF in this research.

As well as measuring DSE/IF, we argue that for a typical population of children, our computer role-play task is a valid measure of social vulnerability. We propose that computer role-play technologies, as opposed to traditional 'paper and pencil' measures, offer a valuable method for measuring social behaviours in clinical settings and controlled research environments that can provide a 'more real to life' or fidelity of assessment of children's social behaviour – because of the interactive participation that the children have to take. Here, we highlight the potential benefits of computer role-play technologies as psychological measurement tools for assessing children's social behaviour in a more ecologically valid way.

1.1. Measuring children's social understanding

Since Wimmer and Perner's (1983) seminal work, measuring children's social understanding has come from a theory of mind tradition (ToM: An understanding that another's mental state/intentions may be different from your own): From using dolls (e.g. Baron-Cohen, Leslie, & Frith, 1985), to advanced theory of mind measuring story vignettes (e.g. Happé, 1994; see Rajendran & Mitchell, 2007, for a historical review). Happé's 'Strange Stories' are simplified narratives of everyday scenarios followed by questions that assess the participants understanding of nonliteral language short stories (included measures of sarcasm, figures of Speech, white lies, etc.). Versions of these stories have been shown to even discriminate developmental stages (e.g. O'Hare, Bremner, Nash, Happé & Pettigrew, 2009) and between those who do and do not have ASD (Happé, 1994) and disinhibited attachment disorder (Kay & Green, 2016). Even those who passed 2nd order ToM tasks gave incorrect responses to some of the strange stories (Happé, 1994; Jolliffe & Baron-Cohen, 1999).

Despite the popularity of story vignettes, it is argued that most of the experimental paradigms designed to assess ToM abilities involve fairly well developed expressive and receptive language skills, which can cause issues, since many groups of children have poor verbal abilities (Colle, Baron-Cohen, & Hill, 2007). Thus, failure on such tasks may in fact reflect participants' inability to comprehend task instructions, nearly as much as deficits in mental-state understanding (Astington, 2001; Frye, Zelazo, & Palfai, 1995). As such other novel approaches have been suggested, for example; Sivaratnam, Cornish, Gray, Howlin, and Rinehart (2012) successfully validated a colorful comic strip ToM measurement tool that better relies on non-verbal abilities to facilitate children who suffer from language related impairments. The success of this type of task relies on clear visuals such as the characters changing emotions and changing scenes presented in each scenario to help the children follow the story with ease in a non-verbal way.

However, Rajendran and colleagues (Rajendran & Mitchell, 2000; Rajendran, Mitchell & Rickards, 2005) argued that such tasks (Verbal or nonverbal) measure children's *reflective* rather than *working* understanding and that computer-role play offers a truer indication of children's understanding. Computer-role play offers the chance of putting 'oneself in another's shoes' and potentially having to simulate (Harris, Kavanaugh, Wellman, & Hickling, 1993; Jones, Price, & Selby, 1998), what a character might do in a hypothetical situation. This is in contrast with the story vignette paradigm in which a child might feel under pressure to give the correct or most appropriate answer (Siegal, 2004) or have to work the correct answer in a more abstract or 'theory theory' type way (e.g. Chapman, 1988).

Another advantage of using computer-role play technology is that it is immersive – that is it can give players a sense of "psychological presence" of being there (Tamborini & Skalski, 2006) and identity (Gee, 2014). Presence is important because the greater the degree of presence, the more chance that participants will behave in a virtual environment, in a manner which is comparable to their behaviour in the "real world". Arguably, presence brings into play "natural" responses to a situation (e.g. Slater & Wilbur, 1997).

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