

**Experimental methodologies used in studies examining children’s lie-telling behaviour:**

**A review**

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**Abstract**

The scientific study of children’s development of lying is a topic to which developmental psychologists have devoted significant scholarly attention. To examine the development of lie-telling behaviours, a range of experimental methodologies have been used. This review critiqued different procedural techniques utilised in laboratory studies of children’s deceptive behaviours. It reviewed the strengths and limitations of conventional experimental paradigms, focusing on the shortcomings which question the ecological validity of studies employing these paradigms. The “temptation resistance paradigm”, the “reverse rogue paradigm” and the “undesirable gift paradigm” were also discussed. Discussion of these paradigms centred on evaluating the methodology and ecological validity of each procedure. The purpose of this review was two-fold, i) to examine the soundness of each paradigm; ii) to note the limitations that should be considered when conducting investigations of children’s lie-telling behaviour. The following review argues that the most effective paradigm for use with children depends on the topic to be studied, specifically pertaining to the lie-type that is to be investigated.

**Keywords**

child, deception detection, experimental methodologies

## Introduction

Deception is a common feature of daily social interaction ([O'Sullivan, 2003](#); [ten Brinke & Porter, 2012](#)). On average, people lie twice daily for various reasons ([DePaulo, Kashy, Kirkendol, Wyer, & Epstein, 1996](#)). Whereas lies are stereotypically viewed to serve treachery, "white" lies are seen to foster social cohesion ([Ekman, 2001](#)). For example, the wise boyfriend promptly learns that he should tell a "white" lie when answering the question "do I look fat in this?" regardless of his girlfriend's actual appearance. Although such lies may be trivial and of little consequence; perjury in court, withholding suicidal ideations in psychotherapy, and masking one's ill intentions to cause harm, are examples where deception may have serious consequences. Accordingly, deception and deception detection have been studied extensively. In particular, developmental psychologists (see [Lee, 2013](#); also [Talwar & Crossman, 2012](#) for reviews) have examined a range of topics from children's conceptual and moral reasoning (e.g. Bussey, [1992](#), [1999](#); [Lee, 2000](#); [Lee & Ross, 1997](#)) to the development of lie-telling behaviour (e.g. [Lewis, Stanger, & Sullivan, 1989](#); [Polak & Harris, 1999](#); Talwar & Lee, [2002a](#), [2002b](#), [2008](#); Talwar, Lee, Bala, & Lindsay, [2002](#), [2004](#); [Talwar, Murphy, & Lee, 2007](#)).

Research on the development of lying is valuable as it has vast theoretical implications for understanding children's social cognitive development (e.g. Talwar & Lee, 2008; Polak & Harris, 1999; [Sodian, 1991](#)); and practical applications in clinical, educational and forensic settings (e.g. [Goodman et al., 2006](#); [Strichartz & Burton, 1990](#); Talwar et al., 2002, 2004). Although this area is under researched (Talwar & Crossman, 2012), various procedural techniques used to examine the development of lie-telling behaviours have proliferated. This review will evaluate the differing experimental methodologies which psychologists have employed in their research.

### Conventional experimental paradigms

Early investigations of children's lying were conducted as observational studies (e.g. [Newton, Reddy & Bull, 2000](#)) or utilised experimental paradigms that asked children to lie about a fact or an opinion (e.g. [Feldman, Jenkins, & Popoola, 1979](#); [Feldman & White, 1980](#)). For example, Feldman and colleagues (1979) examined children's deceptive behaviour by asking children to persuade an interviewer that two drinks both tasted either good (positive taste condition) or bad (negative taste condition), regardless of the actual taste. One of the drinks was a sweetened grape drink and the other was a sugar-less equivalent. In the positive taste condition (i.e. required to say both drinks tasted good) children were classified as being truthful when discussing the sweetened drink, and as lying when describing the unsweetened drink. The converse was true for the negative taste condition (Feldman et al., 1979). These early experimental procedures required asking the participant to lie, and parallel the type of paradigms that are typically used to study deception in adults.

Experimental paradigms are conventionally employed in deception research for various reasons. First, the experimenter is provided with the ability to examine different lie types, for example *antisocial* (self-serving lies, e.g. lies to avoid punishment) or *prosocial* lies (e.g., white-lies; Talwar & Crossman, 2012). Second, specific procedures may produce consistent verbal statements across truthful and deceptive conditions, allowing for direct comparisons of non-verbal behaviour between truths and lies. These strengths are pertinent to investigations of children's lying as conventional paradigms provide the experimenter with a certain level of freedom, and the prospect to examine a multitude of topics.

However, there are notable limitations to conventional experimental paradigms. In their study, Talwar and Lee (2008) suggested that children's lying develops in three stages – primary, secondary, and tertiary – each increasing in readiness, moral, and cognitive ability, to lie (*also* Talwar & Crossman, 2012). When employing an experimental paradigm such as that used by Feldman and colleagues (1979), the tasks are cognitively demanding and target children in the tertiary stage of development. Engaging younger children ( $\approx$  2-4 years) in these procedures may be inappropriate as they require a certain level of cognitive sophistication which may not yet have developed (Talwar & Lee, 2002b, 2008). Therefore, the age of the children participating in conventional experimental paradigms should be considered.

There are also two further methodological issues concerning conventional experimental paradigms which require examination. Similar to the procedures employed by Feldman and colleagues (Feldman et al., 1979; Feldman & White, 1980), conventional experimental paradigms *sanction* and *instruct* the participant to lie (see [DePaulo et al., 2003](#); [Wright, Berry, & Bird, 2012](#)).

Many researchers have criticised the use of sanctioned lies, arguing that these lies result in participants feeling less guilt ([Vrij, 2000](#)), motivation ([Ekman, 1981](#)), and, consequently, less associated arousal and cognitive effort ([Zuckerman, DePaulo, & Rosenthal, 1981](#)). As a result, some researchers suggest that sanctioned lies may lead to a reduction of diagnostic cues to deception ([DePaulo et al., 2003](#); Ekman, 2001). While only a few studies have examined the differences between sanctioned and unsanctioned lies (e.g. [Feeley & deTurck, 1998](#); [Sporer & Schawandt, 2007](#)), there appears to be very few consistent behavioural differences across lie types. Moreover, it appears that 'judges' are unable to discriminate between the lie types ([Feeley, 1996](#)). These arguments suggest that

sanctioned lies are suitable for use in studies of deception. However, it should be noted that the implications of these arguments pertaining to the study of children's lying have not been examined.

Whereas critics of sanctioned lies question the generalisability outside of the experimental setting, advocates contend that sanctioned lies may preserve ecological validity (Wright et al., 2012). In everyday life, most lies are generally unplanned, of little significance, and little consequence (DePaulo et al., 1996). Furthermore, the sanctioned lies in most experimental studies are falsehoods about an event, or attitudes towards an issue or an individual, and are indeed those most often told in everyday social interactions ([DePaulo & Rosenthal, 1979](#)). Such lies are generally sanctioned by society when they are social in nature (e.g., *prosocial* lies); or sanctioned by family, friends, or personal ideals (Wright et al., 2012). Similar to studies with adults, early investigations of children's lying (e.g., Feldman et al., 1979), faced this criticism.

Another criticism concerning instructed lies is that they lack ecological validity. Talwar and Crossman (2012) contended that this methodology "creates an artificial situation" that does not reflect the "nature of lying" (p. 147) as it is in the real-world. [Sip et al. \(2010\)](#) suggested experimental paradigms that allow participants to choose – if and when – to lie. One may propose that the premise that "instructed lies are not ecologically valid" is perhaps flawed. Wright and colleagues (2012) reasoned that in everyday life there are several instances where individuals are instructed to lie. These may include children instructed to lie by their parents when receiving an undesirable gift, and when legal or moral pressures compel people to lie (*see also* Ekman, 2001). Accordingly, in everyday life, there may not always be an opportunity to choose to lie. Furthermore, an experimental

paradigm which produces non-instructed, self-initiated lies may introduce confounding factors. Paradigms which involve the participant choosing to lie may result in the participant only lying when they are confident that the lie will be successful (Wright et al., 2012). Thus, the number of lies told by participants may vary as a function of participants' confidence in their ability to deceive. However, this notion remains untested.

These methodological issues pertain to the majority of experimental paradigms employed in studies of deception and are particularly relevant to studies examining children's lying. As early studies on children's lying behaviour sanctioned and instructed the child to lie, it can be proposed that the results are most representative of consciously false statements. In future, researchers should be aware that experimental paradigms which sanction and instruct the participant to lie may have questionable ecological validity.

### **Temptation resistance paradigm**

To overcome the limitations faced by conventional paradigms, other paradigms were developed for use with children. The temptation resistance paradigm, as designed by [Sears, Rau and Alpert \(1965\)](#), has become the most frequently employed method to study children's lying (utilised in studies including, Lewis et al., 1989; Polak & Harris, 1999; Talwar & Lee, 2002a, 2008; Talwar et al., 2002). The paradigm involves explicitly instructing the child to not "peek" inside a box or play with a toy while the experimenter is absent. Upon returning, the experimenter asks the child if they have "peeked". Research has consistently demonstrated that approximately 80-90% of children peek (Talwar & Crossman, 2012), disobeying the experimenter's instructions.

The temptation resistance paradigm is effective in measuring infant lying behaviour (Talwar & Lee, 2008). The task is short and places minimal demands on children. Further,

the paradigm is ecologically valid (Talwar & Lee, 2002a). Not only does the paradigm reflect a scenario children are regularly faced with (Lewis et al., 1989), the paradigm also emulates the types of *antisocial* lies young children tell, specifically, lies concealing their transgressions (disobeying the instructions; [DePaulo & Jordan, 1982](#); [Wilson, Smith, & Ross, 2003](#)). Empirical evidence from observational studies (e.g. Newton et al., 2000; Wilson et al., 2003) demonstrates that children's initial lies are of denials of wrongdoings or rule violations. Further, the paradigm allows for the examination non-instructed, self-initiated lies (Talwar & Lee, 2002a; Talwar & Crossman, 2012). The temptation resistance paradigm differs from earlier paradigms that instruct and sanction the participant to lie as the paradigm reflects a naturalistic scenario in which children are given the opportunity to spontaneously lie.

Despite these strengths, the temptation resistance paradigm still has methodological shortcomings. Early studies that employed the paradigm (e.g. Lewis et al., 1989; Polak & Harris, 1999) asked a yes/no question "did you peek?" in which a successful lie is binary coded with a simple "yes" or "no". This type of questioning targets the primary stage of development and has the potential to introduce yes- or no-response biases ([Fritzley & Lee, 2003](#)). To address these issues, Talwar and Lee (2002a) attempted to probe children further by asking "what do you think the toy is?" (p. 438). Asking this question reduced the possibility of response biases having an effect on the experiment. Although the frequency to which children denied peeking did not differ from the binary methodology, probing allowed the examination of the secondary and tertiary stages of development. That is, Talwar and Lee (2002a) were able to examine children's progression from deliberate concealment of

transgressions by negation (the primary stage); to a stage of increased sophistication and an ability to plausibly maintain a lie beyond denial (the tertiary stage).

Another concern of the temptation resistance paradigm was raised by both Polak and Harris (1999) and [Arhern, Lyon and Quas \(2011\)](#). These researchers argued that the paradigm may, for some participants, measure wishful thinking as opposed to actual behaviour. The reasoning for this is that linguistic research examining children's use of the word "no" has demonstrated that the word is initially used to convey aspirations as opposed to a negation ([Hummer, Wimmer, & Antes, 1993](#)). The "no" response children provide in the temptation resistance paradigm may therefore reflect "No, I wish I hadn't peeked" rather than "No, I did not peek". Accordingly, results from the studies that employed the temptation resistance paradigm may not necessarily reflect instances of children's lying behaviour.

To validate children's use of the word "no" as a negation, Polak and Harris (1999) modified the temptation resistance paradigm. The researchers accounted for children's desires by telling them that they were forbidden ("do not touch") or allowed ("It's okay to touch") to touch a guitar (Polak & Harris, 1999). Touching the guitar was considered more desirable for children who were forbidden compared to those given permission. This modified paradigm accounted for children's wishful thinking and validated the use of the word "no" as a negation (Polak & Harris, 1999). Though Polak and Harris (1999) found similar results to previous studies which used the initial paradigm (e.g. Lewis et al., 1989; Talwar & Lee, 2002a), their modified paradigm allowed for the conclusion to be drawn, that, children use the word "no" as a negation in order to lie. The temptation resistance paradigm is effective in measuring the development of children's deceptive behaviours and is

advantageous over conventional experimental paradigms as it allows the examination of children's abilities to tell naturalistic *antisocial* lies (Talwar & Crossman, 2012).

### **Reverse rogue and undesirable gift paradigms**

With the intention to examine children's use of other lie types such as *prosocial* lies, Talwar and Lee (2002b) pioneered the reverse rouge task. In this paradigm, children are asked to take a photo of an experimenter who has a clearly visible, unappealing mark on their face. The child is asked whether the experimenter "look[s] okay" (p. 160) prior to taking the photo (Talwar & Lee, 2002b). In the experimenter's absence, a confederate asks the child their actual opinion of the experimenter's appearance. Talwar and Lee (2002b) found that the majority of children (aged 3 to 7) years had said to the experimenter that they looked okay, while admitting the opposite to the confederate. This was the first published investigation of children's *prosocial* lie-telling behaviours and only study to use of the reverse rouge paradigm.

Despite the importance of Talwar and Lee's (2002b) findings, they should be interpreted with caution due to a methodological limitation. The target question in the reverse rouge paradigm does not directly address the child's underlying rationale for telling a lie. While the lie may be truly *prosocial* in nature and told for altruistic purposes (Talwar & Lee, 2002b); the lie may have conversely been told for fundamentally self-serving reasons (Talwar et al., 2007). Talwar and colleagues (Talwar et al., 2007) recognised that children may consider the notion that telling the truth about the experimenter's appearance may elicit a negative reaction. Thus, results attained from the reverse rouge paradigm may not convey instances of children's *prosocial* lie-telling behaviour, as expected.

On the basis of this flaw, Talwar et al. (2007) adapted procedural techniques from prior research by [Saarni \(1979\)](#) and [Cole \(1986\)](#) to develop an experimental methodology that would unquestionably examine children's white lie-telling behaviour. Specifically, Talwar and colleagues (2007) modified the undesirable gift paradigm. In this paradigm, children are given an undesirable gift by an experimenter who immediately leaves the room. Upon returning, the experimenter asks the child if they like the gift. This provides the opportunity for the child to spontaneously tell a *prosocial* lie to spare the feelings of the experimenter, or tell a 'harsh' truth – that they did not like the gift. The ground truth was determined by verifying the child's feelings regarding the gift. While previous studies (Cole, 1986; Saarni, 1984) had a confederate ask the child their opinion of the gift, Talwar and colleagues (2007) had the child's parent verify their true feelings towards the gift. Talwar and colleagues (2007) reasoned that children would be more inclined to tell the truth to their parents rather than a confederate. It should be noted however that this notion remains to be empirically tested.

This undesirable gift paradigm is effective in examining children's use of *prosocial* lies. The paradigm allows for the examination of a child's genuine verbal and non-verbal reactions, and also their feigned verbal and nonverbal behaviours to the experimenter (Talwar et al., 2007). The paradigm also mirrors a realistic scenario wherein telling a white-lie is socially desirable and telling the truth is deemed inappropriate (Talwar et al., 2007). Further, the scenario is one which children are highly familiar with (e.g., receiving a jumper as a birthday present from grandparents). Therefore, the undesirable gift paradigm is ecologically valid (Talwar & Crossman, 2012). This paradigm is advantageous over conventional experimental methodologies utilised to examine *prosocial* lies as the undesirable gift paradigm elicits self-initiated, uninstructed lies. Furthermore, the paradigm

offers the opportunity to examine the effect of socialisation and parental instruction on *prosocial* lie-telling behaviour, as children are often explicitly taught by their parents to be polite and to tell white-lies (Talwar & Crossman, 2012). While conventional paradigms instruct children to lie for prosocial reasons (Talwar & Crossman, 2012), the undesirable gift paradigm allows children to spontaneously tell the *prosocial* lie.

Although the undesirable gift paradigm is an improvement on the reverse rogue paradigm, the undesirable gift paradigm still has a limitation. One may speculate that the efficacy of the paradigm rests on the child's emotional involvement with the gift they receive. As a certain level of rapport is required to work with children (Talwar & Crossman, 2012), some children may have not established adequate rapport with the experimenter for the gift to be of any significance; and accordingly, there is no satisfactory reason for them to lie. Arguably, the paradigm epitomises a scenario wherein *prosocial* lies are expected as they serve to foster social cohesion (DePaulo et al., 1996). Studies investigating the altruistic behaviour of children may wish to consider and account for rapport in their methodology.

## **Conclusion**

The experimental methodologies used in studies of children's development of lying have undergone significant advancement. The aim of this review was to examine (i) the reliability of various experimental paradigms, and (ii) to note the limitations which should be considered when conducting investigations of children's lie-telling behaviour. While preliminary paradigms allow the experimenter to examine a multitude of topics and various lie-types with children, they face similar issues to deception studies in adults. In particular, conventional experimental paradigms may have questionable ecological validity as the

experimenter instructs and sanctions the participant to lie. Other paradigms, namely, the temptation resistance paradigm, reverse rogue paradigm and undesirable gift paradigm appear to address these shortcomings and elicit non-instructed, self-initiated lies from children. Although these paradigms are designed explicitly for examining specific lie-types, for example, the undesirable gift paradigm to examine *prosocial* lies, they also have limitations. Arguably, however, these paradigms may be more ecologically valid procedural techniques compared to conventional paradigms. Overall, the temptation resistance paradigm, reverse rogue paradigm and undesirable gift paradigm allow experimenters to effectively examine children's lying behaviour.

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