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Brief Report

Behavioral avoidance of contagion in childhood

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ABSTRACT

Although there is a large literature on children's reasoning about contagion, there has been no empirical research on children's avoidance of contagious individuals. This study is the first to investigate whether children avoid sick individuals. Participants (4- to 7-year-old children) were invited to play with two confederates—one of whom was "sick." Afterward, their knowledge of contagion was assessed. Overall, children avoided proximity to and contact with the sick confederate and her toys, but only 6- and 7-year-olds performed above chance. The best predictor of avoidance behavior was not age but rather children's ability to make predictions about illness outcomes. This provides the first evidence of behavioral avoidance of contagious illness in childhood and suggests that causal knowledge underlies avoidance behavior.

Introduction

Children's understanding of contagion (i.e., the transmission of illness caused by microbes through proximity or physical contact) has been a fruitful area in studying causal learning in early childhood because it has implications for how children acquire biological knowledge and reason about non-obvious properties and mechanisms (Au, Sidle, & Rollins, 1993; Kalish, 1996; Keil, Levin, Gutheil, & Richman, 1999). Although the term "germ," for example, is generally introduced to children early in life, it describes a causal mechanism for illness that they cannot see or touch. Thus, researchers have taken an interest in how children develop concepts of illness and how illness is transmitted from one person to another.

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Children's reasoning about illness begins to develop during the preschool years and continues throughout middle childhood (Keil et al., 1999; Myant & Williams, 2005). Some studies report an early-emerging understanding of how contagious illness is transmitted, suggesting that by 4 years of age children have a physical understanding of illness transmission and differentiate between contagious and non-contagious interactions (Kalish, 1996). For example, 4-year-olds can provide physical explanations for what made someone sick, indicating that they have some knowledge of the relevant causes of illness and recognize that contact plays a special role in transmission (Legare, Wellman, & Gelman, 2009).

Conversely, studies examining a wider age range suggest that a full understanding of illness transmission develops in a piecemeal fashion and is organized into a coherent framework only once children have acquired an understanding of the complex biological processes that underlie illness transmission (Kalish, 1999). In other words, although young children may have some knowledge of risk behaviors and contaminants such as germs, they do not acquire a deeper understanding of the causes of illness until much later in development. For example, preschool children can pick out relevant *causes* of illnesses, but they cannot use that knowledge to make *predictions* about whether someone will become sick after engaging in a risk behavior (Legare et al., 2009).

Although there is a large body of research examining children's conceptual understanding of illness transmission, there are only a handful of studies on how children *behave* toward a contaminated object (e.g., DeJesus, Shutts, & Kinzler, 2015; Rozin & Fallon, 1987) and there is no research to date on how children's behavior is affected by a sick or contagious person. The lack of data on this topic is problematic because children are especially risky carriers of infection, not only by catching diseases themselves but also by enabling greater transmission of infection to others (Bryant & McDonald, 2009; de Lencastre & Tomasz, 2002; Lambe et al., 2012). Contact with or exposure to sick people is what causes contagious illnesses to spread. Thus, behavior when confronted with a sick individual is most relevant to how children actually get sick and whether they are likely to spread illness to others.

Given that it is adaptive to engage in disease-avoidant behaviors, several theories predict that behaviors leading to the avoidance of harmful pathogens should appear early in development and persist into adulthood (Boyer & Bergstrom, 2011; Rottman, 2014; Schaller & Park, 2011). The behavioral immune system theory, for example, proposes that humans have a system of psychological mechanisms that protect against infectious disease (Neuberg, Kenrick, & Schaller, 2011; Schaller & Park, 2011). Evidence suggests that adults engage in behaviors that limit contact with pathogens and that these behaviors even overgeneralize to people who show signs of non-contagious illnesses and disfigurements (Park, Van Leeuwen, & Chochorelou, 2013; Ryan, Oaten, Stevenson, & Case, 2012). However, due to the lack of data on children's behavior, the developmental trajectory of these behaviors and the developmental mechanisms underlying them remain unexplored.

One potential mechanism underlying the development of disease-avoidant behavior may be children's causal knowledge of contagion and how illnesses are spread (Siegal, Fadda, & Overton, 2011). Children who have a more sophisticated causal understanding of illness transmission may be more likely to understand how engaging in risk behaviors, such as approaching someone who is sick, could lead to the transmission of illness (Au et al., 2008). If this is the case, avoidance behavior should develop between 4 and 7 years of age alongside children's causal knowledge of illness transmission. An alternative possibility is that avoidance behavior appears even earlier in development or that avoidance behavior is unrelated to children's knowledge about illness transmission; each of these outcomes would suggest that causal knowledge does not play a critical role in the development of these behaviors.

Given that there is currently no empirical work on when children begin to exhibit avoidance of sick individuals, the current study aimed to specify the developmental trajectory of disease-avoidant behavior in early childhood. Children from 4 to 7 years of age were invited to play with two confederates—one who was "sick" and one who was not—for a period of 5 min, and we measured children's proximity to and contact with the sick/healthy confederates and their toys. In addition, we explored whether children's causal knowledge of illness transmission is related to their avoidance behavior by giving them a vignette task that assesses their explanations for and predictions about scenarios involving illness transmission.