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Article (Accepted Version)

Oleszkiewicz, Anna, Pisanski, Katarzyna and Sorokowska, Agnieszka (2017) Does blindness influence trust? A comparative study on social trust among blind and sighted adults. *Personality and Individual Differences*, 111. pp. 238-241. ISSN 0191-8869

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## **Does blindness influence trust? A comparative study on social trust among blind and sighted adults**

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**Running head:** Social trust among blind and sighted adults

**Word count:** 3371

Highlights:

- Study included 32 congenitally blind, 27 late blind and 65 sighted men and women
- Participants completed a standardized survey measuring their level of social trust
- Belief that people are exploitative was stronger than belief that people are dishonest
- Blind and sighted persons did not differ in any subscale of social trust
- Visual deprivation across lifetime does not predict level of trust in others

## **Abstract**

Although blind individuals must often rely on others to navigate their physical environment, recent studies concerning differences between blind and sighted persons in attributing social traits to others based on nonvisual cues remain inconclusive. Here we examined whether blind and sighted individuals vary in their level of social trust in others. One hundred and twenty-four healthy men and women participated in the study, including 32 congenitally blind, 27 late blind, and 65 sighted adult controls. We measured levels of social trust represented by two independent convictions, that people are exploitative, or dishonest. Linear mixed models showed no significant differences between sighted, late blind and congenitally blind individuals, indicating that visual deprivation does not predict level of trust in others. For both blind and sighted participants, the belief that people are exploitative was stronger than the belief that people are dishonest.

**Keywords:** social trust, trustworthiness, blindness, visual impairment

## **1. Introduction**

Trust positively influences social interactions (Fu, 2004; Van Lange, 2015) and drives socially-desired behaviors, such as willingness to cooperate (Balliet & Van Lange, 2013; Simpson, 2007; Zaheer, Mcevily, & Perrone, 1998), sharing information and knowledge (Matzler & Renzl, 2006), conflict avoidance (Rotter, 1980), and prosociality more generally (McAllister, 1995; Singh & Srivastava, 2009; van Ingen & Bekkers, 2015). On an interpersonal level, trust often involves a trustor's cognitive awareness of being vulnerable to a trustee and expectations of the trustee's favorable behaviour across time (Fulmer & Gelfand, 2012; Simpson, 2007). To be considered trustworthy, the trustee is expected to be reliable, cooperative, and helpful (Deutsch, 1973; Rotter, 1971). While such reciprocation can result in benefits for both the trustor and trustee, trust also entails a risk, wherein a trustee may act adversely toward the trustor and as a consequence, either or both parties may pay a cost (Colquitt, Scott, & LePine, 2007).

Visual deprivation may affect the relative costs and benefits of trusting others. Indeed, blind individuals must rely on others across a range of circumstances such as when navigating their physical environment. Previous studies have demonstrated differences between blind and sighted persons in the development and frequency of various social behaviours. For example, although blind infants were able to participate in proto-conversations with their mothers, they had difficulty sharing their opinions about external objects (outside the child-mother dyad) (Preisler, 1991). Blind school-aged children experience rejection and isolation from their peer group more often than do sighted children (Jones, Lavine, & Shell, 1972) and appear to develop various psychological processes more slowly (Markoulis, 1988). Taken together, blindness may increase vulnerability in social interactions and the risk of being defected against, whereas experiences of rejection and isolation may elicit greater distrust towards others. Similarly, losing one's sight later in life has been shown to result in a relatively slower

acquisition of socially-relevant skills compared to congenital blindness, as well as a greater risk of depression (Fitzgerald, Ebert, & Chambers, 1987). Such distress might also negatively influence the quality of social relationships, increase social isolation and consequently decrease social trust among visually impaired individuals.

At the same time, visual deprivation need not always necessitate increased reliance on others. Indeed, many blind persons are experts at navigating their environment and completing everyday tasks without the help of others (Leonard & Newman, 1967). There is also evidence that blind individuals may outperform their sighted counterparts when learning actions and behaviors from others. This process engages the mirror neuron system, responsible for activation of action schemas, and can develop in the absence of visual input (Ricciardi et al., 2009). Congenitally and late blind adults are also able to effectively use cues from nonvisual modalities in person perception, such as when judging the warmth, competence and trustworthiness of another person from their voice alone (Oleszkiewicz, Pisanski, Lachowicz-Tabaczek, & Sorokowska, 2016) or accurately assessing differences in body size from the voice (Pisanski, Oleszkiewicz, & Sorokowska, 2016). Although it remains unclear whether these abilities are sufficient to overcome potential social challenges arising from blindness, these skills could allow blind persons to effectively handle social situations thereby leading to levels of social trust comparable to those observed among sighted persons.

To test whether visual deprivation predicts levels of social trust toward others, we compared self-reported social trust scores in a sample of 124 sighted, congenitally blind, and late blind men and women.

## **2. Materials and Methods**

### *2.1 Participants*

One hundred and twenty-four healthy men and women participated in the study, including 65 sighted adult controls (aged 18-67,  $M = 33.7 \pm 11.9$  years; 40 females), 32 congenitally blind

adults (aged 17-59,  $M = 34.4 \pm 9.8$  years; 16 females) and 27 late blind adults (i.e., individuals who lost their vision after age 3; aged 23-64,  $M = 48.3 \pm 11.4$  years; 17 females). Among late blind adults, sight loss duration ranged from 1.5 to 50 years ( $M = 20.6 \pm 13.2$ ). Participants were recruited through a specialized agency that contacted regional associations of blind persons operating in various parts of the country. All participants provided written informed consent, and were compensated for their participation.

### *2.2 Trust scale*

Participants answered eight items designed to measure their level of social trust (Yamagishi, 1988), responding to each item on a 7-point Likert scale, where 1 represented *I absolutely disagree* and 7 represented *I absolutely agree*. This standardized eight-item scale has been used in hundreds of previous studies (e.g. Hiraishi, Yamagata, Shikishima, & Ando, 2008; Parks, 1994). Higher scores indicate greater distrust and lower scores represent greater trust. Items on the trust scale can be categorized into two principal factors: the first representing beliefs that people are exploitative and that trusting others is risky (e.g. “In dealing with strangers, one is better off to be cautious until they have provided evidence that they are trustworthy”), the second representing beliefs that people are dishonest (e.g. “Given the opportunity, people are dishonest”) (Yamagishi, 1988).

### *2.3 Procedure*

Participants completed the study in individual sessions. First, a standardized interview was used to collect demographic data and to confirm the absence of any mental disorders, head injuries or diseases, and the use of medication that could potentially influence processing questions. The trust scale questionnaire was administered orally to all participants. To create identical testing conditions, sighted participants were blindfolded when answering questions, and all participants were seated at a desk in the same position. The study was performed in

accordance with the Declaration of Helsinki on Biomedical Studies Involving Human Subjects and was approved by the University Institutional Review Board.

### 3. Results

Following previous work (Yamagishi, 1988), we computed two trust scores for each participant that were included as dependent variables in the model representing: (a) the belief that people are exploitative (Cronbach's alpha = .65), and (b) the belief that people are dishonest (Cronbach's alpha = .71). Trust scores on both subscales were significantly positively correlated ( $r=.44$ ,  $p<.001$ ), but each subscale explained only 20% of the variance in the other. To test whether blind and sighted men and women differed in their level of social trust, we performed a linear mixed model (LMM) with maximum-likelihood estimation. The model included sightedness (sighted vs late blind vs congenitally blind), participant sex (male vs female) and trust subscale (dishonest vs exploitative) as fixed effects, and age as a covariate.

The model revealed a significant main effect of trust subscale  $F(1,238)=76.8$ ,  $p<.001$ , **Cohen's**  $d=1.12$ . Here, pairwise comparisons showed that regardless of sightedness, the belief that people are exploitative was stronger than the belief that people are dishonest. This was true for sighted (exploitative:  $M=4.5\pm.13$ ; dishonest:  $M=3.4\pm.14$ ;  $t(64)=-7.6$ ,  $p<.001$ ;  $d=0.9$ , 95% Confidence Interval, CI= .48-1.51]), late blind (exploitative:  $M=5\pm.2$ ; dishonest:  $M=3.6\pm.2$ ;  $t(26)=-6.6$ ,  $p<.001$ ;  $d=1.3$ , CI= .44-2.1) and congenitally blind participants (exploitative:  $M=4.8\pm.18$ ; dishonest:  $M=3.2\pm.19$ ;  $t(31)=-8$ ,  $p<.001$ ;  $d=1.4$ , CI= .64-2.19; see: Table 1). All pairwise comparisons survived Bonferroni correction (where alpha = .008). The model revealed no other significant main or interaction effects, including no effects of participants' sightedness or sex (all  $F_s<2.8$ ,  $p_s>.06$ ).

Due to the significant main effect of subscale, we ran two additional LMMs examining trust scores for each subscale (exploitative, dishonest) separately. As before the LMMs



included sightedness (sighted vs late blind vs congenitally blind) and participant sex (male vs female) as fixed factors, and participant age as a covariate. These models revealed no significant main or interaction effects (all  $F_s < 1.95$ ,  $p > .14$ ). Removing the nonsignificant factors of sex and age from the models did not change this pattern of results, wherein sighted, late blind and congenitally blind participants still showed no differences in the level of belief that people are exploitative, or dishonest (all  $F_s < 1.6$ ,  $p > .21$ ) (see Figure 1).

#### **4. Discussion**

Our results show that sighted and blind men and women report similar levels of social trust in others, and that for both blind and sighted participants, the belief that people are exploitative is stronger than the belief that people are dishonest. Thus, visual deprivation, despite often increasing distress and social challenges as well as one's reliance on nonvisual modalities in person perception, does not appear to affect the development of social trust in blind persons. Importantly, the level of social trust reported by our blind and sighted participants corroborates levels reported in previous studies of sighted participants using the same scale, including a cross-cultural study among sighted individuals in Japan (General trust:  $M = 3.5 \pm 0.7$ ) and the United States ( $M = 4 \pm 0.6$ ) (Yamagishi & Yamagishi, 1994).

Blind persons may decide whether or not to trust others on the basis of nonvisual cues in social interactions, which may allow them to make intuitive and accurate judgments about others (Hugdahl et al., 2004; Oleszkiewicz et al., 2016). Socially relevant information about other people can be gathered using nonvisual modalities such as audition, smell or touch. For example, previous studies have shown that people use vocal cues to make judgments about another person's health (Smith, Dunn, Baguley, & Stacey, 2016), body size (Pisanski, Fraccaro, Tigue, O'Connor, & Feinberg, 2014) and various socially relevant traits such as masculinity/femininity (Borkenau & Liebler, 1992; Smith et al., 2016). It has repeatedly been shown that attractiveness judgments based on visual and vocal information covary (Collins &

Missing, 2003; Hughes & Miller, 2015; Saxton, Caryl, & Roberts, 2006). Olfactory input also plays an important role in social judgments. Using only body odor cues, people are able to formulate accurate judgments of a person's personality (Sorokowska, Sorokowski, & Szmajke, 2012), sex (Hold & Schleidt, 1977; Russell, 1976), social dominance (Havlicek, Roberts, & Flegr, 2005) or even affective state of the odor donor at the time of donation (Chen & Haviland-Jones, 1999, 2000). Blind individuals might use any or all of these nonvisual cues to effectively navigate social situations and hence develop generalized trust towards others, even in the absence of visual information.

The current study was conducted in Poland - country characterized by a rather low level of communal trust (Gesthuizen, Van Der Meer, & Scheepers, 2009), and although one might argue that blind persons may feel more vulnerable than sighted persons particularly in such an environment, our results suggest that this is not the case. At the same time, previous work has shown that involvement in social networks positively influences trust (Putnam, 1995). Here it is important to note that blind persons are typically enthusiastically involved in various formal and informal social networks, potentially further explaining our results. Indeed, most of the participants in the study were affiliated with organizations for blind individuals. Additionally, most participants arrived to the study site with assistance of a relative or friend (e.g., a neighbor). Such examples of social involvement might represent a propensity toward, or could help to foster, general social trust in others (Delhey & Newton, 2003). Moreover, as social trust is higher in small-scale (Welch et al., 2005) and homogenous (Rice & Steele, 2001) communities, effective functioning within social networks might mitigate any potentially negative effects of blindness on social trust.

People differ in how much they trust others, and social scientists have long been investigating the various factors that predict trust and cooperation in humans, ranging from individual differences in hormone levels to societal norms about expected contributions to

public goods. Our findings contribute to this literature by demonstrating that individual differences in visual experience across the lifetime – and thus differential reliance on nonvisual modes of social communication – are unlikely to explain variance in people’s levels of trust in others. We did not control for particular individual experiences of being betrayed, deceived, or defected on, that could potentially influence a person’s level of social trust. Former studies indicate that once trust is broken, it is much more difficult to rebuild it than it is to build trust with no such history (Haselhuhn, Kennedy, Kray, Van Zant, & Schweitzer, 2015). Therefore, future studies on social trust might control for personal experiences of this kind. In future work, researchers may examine whether blind and sighted individuals behave differently in various cooperation paradigms, such as the Prisoner’s Dilemma, or outside of the laboratory in ecologically valid contexts involving implicit measures of trust.

### **Acknowledgments**

The authors kindly thank Natalia Wernecka, Anna Trzepizur and Joanna Widomska for assisting in data collection.

### **Funding**

This work was supported by the Polish Ministry of Science and Higher Education [scholarships for years 2015-2018 to K.P. and 2013-2016 to A.S.], the Foundation for Polish Science [START scholarship for 2015 to K.P.], and the Polish National Science Centre [OPUS Grant No. 2013/11/B/HS6/01522 to A.S.].

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141–159.

*Table 1: Descriptive statistics for social trust scores in sighted and blind participants (Mean, SEM in brackets; lower scores indicate greater trust)*

	People are exploitative		People are dishonest		General trust <sup>a</sup>	
	Female	Male	Female	Male	Female	Male
Sighted	4.5 (0.2)	4.5 (0.2)	3.4 (0.2)	3.4 (0.2)	4.3 (0.1)	4.4 (0.2)
Late blind	4.8 (0.2)	5.3 (0.2)	3.5 (0.2)	4.0 (0.2)	4.3 (0.2)	3.8 (0.2)
Congenitally blind	5.0 (0.3)	4.5 (0.3)	3.0 (0.3)	3.4 (0.3)	4.3 (0.2)	4.2 (0.2)

a. The General trust score represents an average of responses on both subscales

Figure(s)  
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