

Please follow the publication link:

http://www.scitopics.com/Perceiving_children_s_limits_of_action.html

Perceiving children's limits of action

Cordovil, R., & Barreiros, J.

Faculty of Human Kinetics, Technical University of Lisbon

The ability of perceiving other people's limitations and capabilities is fundamental for a successful social interaction. Adults frequently adapt their actions according to what they perceive to be other people's action capabilities or expected behaviour: they slow down their pace when accompanying an older person, they offer to help a pregnant woman if she is carrying weights, and they help children crossing the street.

The possibilities for action of an actor in an environment, or affordances (Gibson, 1979), are specified by public information that is available not only to the actor but also to other people. Previous studies indicate that adults can perceive other adults' limits of actions in different tasks (Fischer, 2003; Mark, 2007; Ramenzoni, Riley, Shockley, & Davis, 2008; Rochat, 1995; Stoffregen, Gorday, Sheng, & Flynn, 1999). These studies indicate that even though the information about other people's affordances seems to be public and perceivable, it is not always accurate.

The evaluation of a child's action limits by an adult is one of the most common and relevant situations in daily life, and it is beginning to receive some attention in the recent literature. Parents and caregivers should be able to recognize their children's action capabilities and act accordingly. A few studies (Cordovil & Barreiros, 2010, in press-a, in press-b; Cordovil, Barreiros, Santos, & Carita, 2010) have addressed the issue of adults' perception of children's vertical and horizontal reaching capability. In what concerns vertical reaching, a wrong judgement of whether an object is within reach of a child, might lead adults to place dangerous objects in places accessible to children. Horizontal reaching is an action that usually is not related to child's accidents, except in some specific environments (e.g., reaching a toy from the swimming pool deck). The studies that addressed adults' perception of children's vertical reaching capability (Barreiros & Cordovil, 2010; Cordovil & Barreiros, 2010, in press-a, in press-b), and of children's horizontal reaching capability in a swimming pool scenario (Cordovil, Barreiros, & Santos, 2010; Cordovil, Barreiros, Santos et al., 2010), indicate that the perceiver's accuracy and the nature of bias effects are influenced by three major factors: the characteristics of the task, the characteristics of the observer, and the characteristics of the child. The main results of these studies are presented next.

Characteristics of the task

Errors in the perception of children's affordances depend on task conditions. The vertical reaching studies (Barreiros & Cordovil, 2010; Cordovil & Barreiros, 2010, in press-a, in press-b) presented a smaller error magnitude than the horizontal reaching studies a swimming pool (Cordovil, Barreiros, & Santos, 2010; Cordovil, Barreiros, Santos et al., 2010). These differences are probably due to the fact that the former task is clearly constrained by the child's anthropometric characteristics, whereas the later is also influenced by other factors (e.g., children's propensity to take risks). Horizontal reaching is clearly constrained by one's body dimensions (Carello, Groszofsky, Reichel, Solomon, & Turvey, 1989); however, in the risk scenario presented, body dimensions were not strong predictors of the child's reaching limit (Cordovil, Barreiros, & Santos, 2010; Cordovil, Barreiros, Santos et al., 2010). The error bias is also influenced by the task characteristics. The child's reaching limits are frequently overestimated in the vertical reaching task (with some exceptions that will be addressed later), and frequently underestimated in the horizontal reaching task in the swimming pool. Parents in particular tend to overestimate their child's vertical reaching limit (Barreiros & Cordovil, 2010; Cordovil & Barreiros, in press-b) but are quite cautious in the swimming pool environment, underestimating their child's horizontal reaching limit (Cordovil, Barreiros, & Santos, 2010; Cordovil, Barreiros, Santos et al., 2010).

The information available during estimation is another important task constraint. Most experimental designs have generally considered the visual presence of the model. However, the adult's estimation of a child's dimensions and capabilities often occurs in the absence of the child (e.g., when an adult buys clothes for a child or rearranges an environment in a way considered safe for a child). One study addressed the issue of adult's estimation of three children's reaching limits in present and absent conditions (Cordovil & Barreiros, 2010). The results indicate that estimation errors in the absent condition are greater than in the present condition. There is also a greater tendency to overestimate children's reaching capability in the present condition. In the absent condition, the reaching capability of the two older children was underestimated.

Characteristics of the observer

The magnitude of error and the error bias that adults' reveal while estimating a child's vertical reaching limit depend on their level of experience in dealing with children. Studies in which three groups of adults (professional caregivers, parents and inexperienced adults) judged children's vertical reaching limits, indicated that experience seems to be relevant for the perception of children's action limits (Cordovil & Barreiros, in press-a, in press-b). Professional caregivers were the most accurate group. Inexperienced adults tended to underestimate children's reaching capability, while parents tended to overestimate it. The more precise judgement observed on professional caregivers may indicate a perceptual attunement and an observational learning effect.

The height of the observer is an individual constraint that should also be taken into consideration. A previous study that addressed the relationship between other people's

affordances and the viewing perspective (Ramenzoni et al., 2008), suggested that eye-height scaled optical information was used to evaluate action limits for others. In Ramenzoni et al.'s study, taller observers exhibited larger errors when estimating the reaching capability of shorter models. However, that effect was not verified in studies that evaluate the perception of children's action limits by adults (Cordovil & Barreiros, 2010). The great discrepancy between the adults' and the children's heights seems to equally affect shorter and taller adults when judging children's reaching capabilities.

Other individual constraints, such as the observer's gender, height or age don't seem to influence adult's estimations of children's reaching capability.

Characteristics of the child

Studies that investigated adult's judgements of different children's vertical reaching limits (Cordovil & Barreiros, 2010, in press-a), indicated that the younger children's action limits were more difficult to estimate: error magnitude was usually greater and the reaching limits were more frequently overestimated. The greater overestimation of reaching capability was not due to a greater overestimation of the younger child's height (which was generally underestimated), but was probably due to a difficulty for the adults to consider children's inherent body proportions, considering them as "small adults" based on a proportional frame of reference for adults (Cordovil & Barreiros, 2010). In fact, children's body appearance as a whole changes across lifespan. Younger children have more different proportions from adults, with larger heads and shorter limbs relatively to their body size. The first paintings of children clearly reflect the difficulty of considering children's correct body proportions. As Fogel (2004) points out: "When Christ first appeared in painting as an infant the posture and bodyscaled proportions are more adult-like" (Fogel, 2004, p. 737). Other explanations for the greater difficulty in estimating the younger children's reaching capability might exist (such as a sheer difference in height), but it is very difficult to determine whether estimation errors are a function of absolute height or of body proportions, since height and reaching capability co-vary during growth.

As we have previously mentioned, in some situations, such as in the task of retrieving a toy from the swimming pool (Cordovil, Barreiros, & Santos, 2010; Cordovil, Barreiros, Santos et al., 2010), the children's body dimensions were not strong predictors of their action limits. They were also poor predictors of parent's estimations of their child's action limit. Possibly temperamental characteristics of the child or even of the parent might be more influent in risk scenarios. This issue deserves further investigation.

The evaluation of children's action capabilities by adults is of fundamental importance since it influences the way adults supervise children and structure their environment. There are indications that the accuracy in perceiving children's limits of action is improved in adults who spent more time around children (Cordovil & Barreiros, in press-a, in press-b). Perceptual training seems to help caregivers to be attuned to the relevant information that specifies the

child's limits of action in different scenarios. An adjusted perception of children's capabilities will probably help caregivers to allow the child's active exploration in safer but still challenging environments.

References

- Barreiros, J., & Cordovil, R. (2010). *Parents can perceive their child's vertical reaching capability but they overestimate it: an insight into the perception of other person's affordances*. Paper presented at the Eleventh European Workshop on Ecological Psychology (EWEP), Fréjus, France.
- Carello, C., Groszofsky, A., Reichel, F. D., Solomon, H. Y., & Turvey, M. T. (1989). Visually Perceiving What is Reachable. *Ecological Psychology*, 1(1), 27 - 54.
- Cordovil, R., & Barreiros, J. (2010). Adults' perception of children's height and reaching capability. *Acta Psychologica*, 135(1), 24-29.
- Cordovil, R., & Barreiros, J. (in press-a). Egocentric or allocentric frameworks for the evaluation of other people's reachability. *Human Movement Science*.
- Cordovil, R., & Barreiros, J. (in press-b). Perceiving children's reaching capability. *International Journal of Sport Psychology*
- Cordovil, R., Barreiros, J., & Santos, C. (2010). *Retrieving a toy from the swimming pool: what children really do and what their parents perceive*. Paper presented at the Eleventh European Workshop on Ecological Psychology (EWEP), Fréjus, France.
- Cordovil, R., Barreiros, J., Santos, C., & Carita, A. (2010). Parent's perception and children's behaviour while trying to retrieve a toy from the swimming pool. *Injury Prevention* 16 (Suppl 1), A51.
- Fischer, M. H. (2003). Can we correctly perceive the reaching range of others? *Br J Psychol*, 94(Pt 4), 487-500.
- Fogel, A. (2004). The history (and future) of infancy. In G. Bremner & A. Fogel (Eds.), *Blackwell Handbook of Infant Development* (pp. 726-758). Oxford: Blackwell Publishing.
- Gibson, J. J. (1979). *The ecological approach to visual perception*. Hillsdale, New Jersey: Lawrence Erlbaum Associates.
- Mark, L. S. (2007). Perceiving the Actions of Other People. *Ecological Psychology*, 19(2), 107 - 136.
- Ramenzoni, V. C., Riley, M. A., Shockley, K., & Davis, T. (2008). An information-based approach to action understanding. *Cognition*, 106(2), 1059-1070.
- Rochat, P. (1995). Perceived reachability for self and for others by 3- to 5-year-old children and adults. *J Exp Child Psychol*, 59(2), 317-333.
- Stoffregen, T. A., Gorday, K. M., Sheng, Y. Y., & Flynn, S. B. (1999). Perceiving affordances for another person's actions. *J Exp Psychol Hum Percept Perform*, 25(1), 120-136.