

## Personal fables and rational thinking in adolescence

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**Abstract:** This study aimed at exploring the association between egocentrism and rationality in adolescence. The sample consisted of 118 adolescents (46.6% of girls; mean age= 13.4±1.3) who completed a self-report questionnaire assessing personal fables dimensions (uniqueness, omnipotence and invulnerability), and 8 syllogistic reasoning tasks (four conflict and four non-conflict syllogisms) assessing rational thinking. Results showed a negative correlation between omnipotence and age in girls, whereas this correlation was positive and marginally significant in boys. A significant gender difference was found in omnipotence, with boys having higher scores. For conflict syllogisms only, significantly higher scores were found in 15-17 years old in comparison to 11-12 years old groups. Conflict syllogisms were negatively correlated to omnipotence and invulnerability in girls only. Our findings suggest that egocentrism and rational thinking are partially related constructs in adolescents. Further research would be needed to assess the relationship between egocentrism and other forms of rationality.

**Keywords:** adolescence; egocentrism; rationality; syllogisms; personal fables; cross-sectional.

### INTRODUCTION

According to Piaget (e.g. Piaget & Inhelder, 1956), the beginning of each stage of cognitive development is characterized by the acquisition of a new cognitive ability that is accompanied with a related egocentric side effect. Elkind (1967) extended Piaget's description of egocentrism in adolescence with an emphasis on the importance adolescents give to what they think others might think about them. He suggested that the ability to mentally represent the thoughts of others, although already present in younger children, has now evolved towards thinking about the possible thoughts of others, and is coupled with some egocentric manifestations such as personal fables (personal uniqueness, omnipotence and invulnerability) and imaginary audience. Although many studies have tried to determine how egocentrism may vary with age and gender, results show several discrepancies (see Galanaki, 2012).

One important aspect of Piaget's formal operational stage at adolescence is the emergence of a more complex logical reasoning. However, several studies have shown that adolescents and adults are subjected to several reasoning biases and that rational thinking may not be the ultimate hallmark of adolescence (e.g. Evans, 1989). In fact, some authors have suggested that egocentrism thinking represents an important reasoning bias

(Stanovich, Toplak, & West, 2008). Some studies have shown negative relationships between formal operations (as measured with analogy tasks) and egocentrism in adolescence (e.g. Lapsley, Milstead, Quintana, Flannery, & Buss, 1986). This tends to invalidate Elkind's assumption that both formal operations and egocentrism would increase in adolescence. Alternatively, some authors have proposed that interpersonal issues in adolescence can lead to an egocentric perspective (Lapsley, & Murphy, 1985). Adolescents would therefore use a somewhat irrational strategy (e.g. personal fables) to cope with their problematic situation. Yet, no studies have tried to verify the connection between egocentrism and some forms of rational thinking using tasks other than those used to assess formal operation thought.

In this study, we aimed at determining if these two aspects of adolescent cognition are related and subject to variation according to age and gender. First, given the discrepancies among the studies assessing the relationship between egocentrism and age, our study examines additional data that will help clarify this question. Second, we expect an increase in rationality scores with age (De Neys & Van Gelder, 2008). Finally, since self and egocentric processing may lead to thinking errors and therefore alter rational thought (Stanovich et al., 2008), we expect to find a negative association between egocentrism and rationality.

## METHOD

### *Participants*

The sample consisted of 118 adolescents, 55 girls and 63 boys (age range: 11-17 years; mean age girls =  $13.5 \pm 1.2$  years; mean age boys =  $13.4 \pm 1.4$ ), recruited from four secondary schools in the French-speaking part of Switzerland. Written parental consent was obtained for each participant.

### *Measures*

***Personal fables.*** Personal fables were assessed with the New Personal Fable Scale (Lapsley, FitzGerald, Rice, & Jackson, 1989). The questionnaire was translated from English to French and presented acceptable reliability for each dimension (omnipotence,  $\alpha = .81$ , 19 items; invulnerability,  $\alpha = .71$ , 14 items; personal uniqueness,  $\alpha = .66$ , 13 items). It is scored on a 5 points Likert scale (from 1 = strongly disagree to 5 = strongly agree) with a high score indicating a high level of egocentrism.

***Rational thinking.*** Rational thinking was assessed with 8 syllogistic reasoning tasks (adapted from De Neys & Van Gelder, 2008), four of which were conflict items, in that the logic was in conflict with the believability of the conclusion. An example of such conflict syllogism was: "All mammals can walk. Whales are mammals (thus) whales can walk". Here, the reasoning is valid but the conclusion is unbelievable. The four other syllogisms were non-conflict items in that the logic was not in conflict with the believability of the conclusion. Each item answered correctly was worth 1 point (score range was then 0 to 8).

## RESULTS

Repeated measures ANOVA revealed significant differences among the mean subscales of egocentrism ( $F(1,117)= 6905,4, p < .01, \eta_p^2=0.98$ ). Pairwise comparisons show that each subscale differs from each other at  $p < .01$  (uniqueness > invulnerability > omnipotence). No relationship was found in the global personal fables scores or in any individual dimension according to age when all subjects were considered. However, a positive correlation between the global egocentric scale and age was found in boys ( $r = .27, p < .05$ ) and a negative correlation between omnipotence and age was found in girls ( $r = -.30, p < .05$ ). In boys, this correlation was positive and marginally significant ( $r = .23, p = .06$ ). The only gender difference found was a higher omnipotence score in boys ( $t(116) = 2.29, p < .05, d = 0.43$ ).

Conflict syllogisms were clearly more difficult to resolve ( $M = .77, S.D. = .85$ ) than non-conflict syllogisms ( $M = 3.38, S.D. = .86$ ). Scores on syllogisms were compared across three age groups: 11-12 years old ( $n = 34$ ), 13-14 years old ( $n = 61$ ) and 15-17 years old ( $n = 23$ ).

Repeated measures ANOVA show that scores of non-conflict syllogisms did not vary according to age ( $F(2, 115) = 1,5, p = .22$ ) whereas those of conflict ones increased with age ( $F(2,115) = 3.97, p < .05, \eta_p^2=0.07$ ). More specifically, Bonferonni post hoc comparisons indicated significantly higher scores in 15-17 years old ( $M = 1.13, SD = .81$ ) than in 11-12 years old ( $M = .50, SD = .66$ ) groups ( $p < .05, d = 0.85$ ). No gender differences were found.

Total personal fable scale as well as its omnipotence and invulnerability dimensions were negatively correlated with scores on syllogisms (see Table 1). However, following partial correlations with gender as a control variable, these relations show no significance.

**Table 1.** Correlations between egocentrism and rationality for the total sample (N=118)

	E	O	I	U	Sy	SyC
<i>Egocentrism (E)</i>	-					
Omnipotence (O)	.89**	-				
Invulnerability (I)	.83**	.68**	-			
Uniqueness (U)	.62**	.30**	.27**	-		
<i>Syllogism Total (Sy)</i>	-.22*	-.24**	-.19*	-.08	-	
Conflict (SyC)	-.15	-.13	-.15	-.07	.55**	-
No Conflict (SyNC)	-.10	-.14	-.06	-.02	.56**	-.38**

\* $p < .05$ ; \*\* $p < .01$

When performed separately for boys and girls (see Table 2), the former showed no relationship between egocentric and syllogisms whereas significant negative relationships were found between conflict syllogisms and total egocentric scale, omnipotence and invulnerability in the latter.

**Table 2.** Correlations between egocentrism and rationality for girls (n=55) and boys (n=63)

	E	O	I	U	Sy	SyC	SyNC
<i>Egocentrism (E)</i>	-	.91**	.80**	.58**	-.23	-.31*	.06
Omnipotence (O)	.87**	-	.70**	.30*	-.26	-.28*	-.01
Invulnerability (I)	.85**	.65**	-	.12	-.22	-.31*	.07
Uniqueness (U)	.66**	.31*	.39**	-	-.02	-.12	.11
<i>Sylogism Total (Sy)</i>	-.23	-.24	-.16	-.13	-	.62**	.53**
Conflict (SyC)	-.01	.00	-.01	-.03	.48**	-	-.34*
No Conflict (SyNC)	-.22	-.24	-.15	-.11	.59**	.43**	-

\* $p < .05$ ; \*\* $p < .01$ ; girls are above the diagonal; boys are below.

## DISCUSSION

The objective of the present study was to conjointly explore egocentrism and rationality in adolescents. Age variations for personal fables were only found when considering boys and girls separately and opposite trends are apparent but only concerning omnipotence. This seems to be supported by the fact that boys showed higher omnipotence scores than girls, as previously reported by Galanaki (2012). This may reflect the social stereotype in which males are expected to display physical strength and leadership. This may also partially explain greater risk-taking in males (e.g. Byrnes, Miller, & Schafer, 1999).

Rational thinking seems to increase from 12 years old to 17 years old but this is only true for conflict syllogisms for which intuitive reasoning was not effective, as reflected by much lower scores. As expected (e.g. Lapsley et al., 1986), a negative relationship between egocentrism and rationality was found, but only in girls. The absence of this relationship in boys is difficult to interpret, but since the maximal age in our sample was 17 years old, it cannot be excluded that this relationship could emerge at a later age in boys. Some authors have suggested that egocentrism may be considered as a coping mechanism that individuals may adopt in order to cope with difficult (or new) social contexts (Schwartz, Maynard, & Uzelac, 2008). However, such a strategy may be maladapted since it is associated with risk-taking (Alberts, Elkind & Ginsberg, 2007). Despite our findings, meta-analysis showed that women are more likely to use coping strategies than men, and most of these are probably not related to egocentrism (Tamres, Janicki, & Helgeson, 2002).

Our study suggests that a counterpart of this egocentrism could be a higher level of irrational thinking, which in turn could lead to worse decision making. De Neys and Van Gelder (2008) suggest that the ability to resolve conflict syllogisms relies on the capacity to inhibit the tendency to produce a belief-based response. If aspects of egocentrism such as omnipotence are high, one might experience more difficulty at inhibiting the tendency to answer conflict syllogisms on the basis of belief rather than on logic. However, boys had higher omnipotence scores than girls and the latter did not outperform the former on conflict syllogisms. That is, inhibition capacities required to resolve such kind of task are probably more determined by other factors such as brain maturation (Neys, Vartanian, & Goel, 2008).

This study is limited by a number of factors. First, results were obtained by using a convenience sample limited to 4 schools. Future research needs to replicate and extend these results with a larger sample that is fully representative of the population. In addition, given the cross-sectional nature of the design, results should be considered as exploratory

and descriptive. Future works need to use longitudinal design in order to examine the evolution of egocentrism and rationality as the child/adolescent gets older. Second, our study did not take into account interpersonal issues as a variable which could be associated with egocentrism in adolescence as suggested by Lapsley and Murphy (1985). Third, as the sample is relatively small, results of group comparison should be taken with caution due to the inequality of the subgroups' sizes and gender composition.

In conclusion, our findings suggest that egocentrism and rational thinking are partially and negatively related constructs in adolescents. In their attempt to create a taxonomy of thinking errors, Stanovich et al. (2008) suggest that self and egocentrism processing may lead to some irrational thoughts. Further studies are needed to determine whether other forms of rationality (e.g. "myside bias") may even be more closely related to egocentrism in adolescence.

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