Supplemental Material

Mental Paper Folding Revisited: The Involvement of Visual Action Imagery

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Overview

This document includes additional analyses that may be of interest to some readers. We report all analyses of the manuscript with an additional factor that distinguishes between male and female participants. Although the error rates showed a tendency of slightly fewer errors in male than in female participants, there were no significant differences between sexes in error rates and reaction times.

1. Reaction Times

To investigate the effects of sex on reaction times, we calculated an ANOVA with the factors sex (male, female), overlap (overlap, no overlap), folds (3, 4, 5) and direction changes (fewer, more). Means and standard errors of RTs are shown in Figure SM1. Statistical values of the ANOVA are shown in Table SM1. Here, we will focus only on main effects and interactions with the factor sex (which are not described in the manuscript).

The significant interaction between sex and overlap was modified by the significant interaction between sex, overlap and folds. It indicated that with 3 folds, RTs were significantly longer with non-overlaps than with overlaps in both sexes ($p_{max} < .001$). With 4 folds, RTs did not significantly differ between overlaps and non-overlaps in both sexes ($p_{min} = .337$). With 5 folds, RTs were significantly longer with overlaps than with non-overlaps in females ($p = .002$), but not in males ($p = .926$).

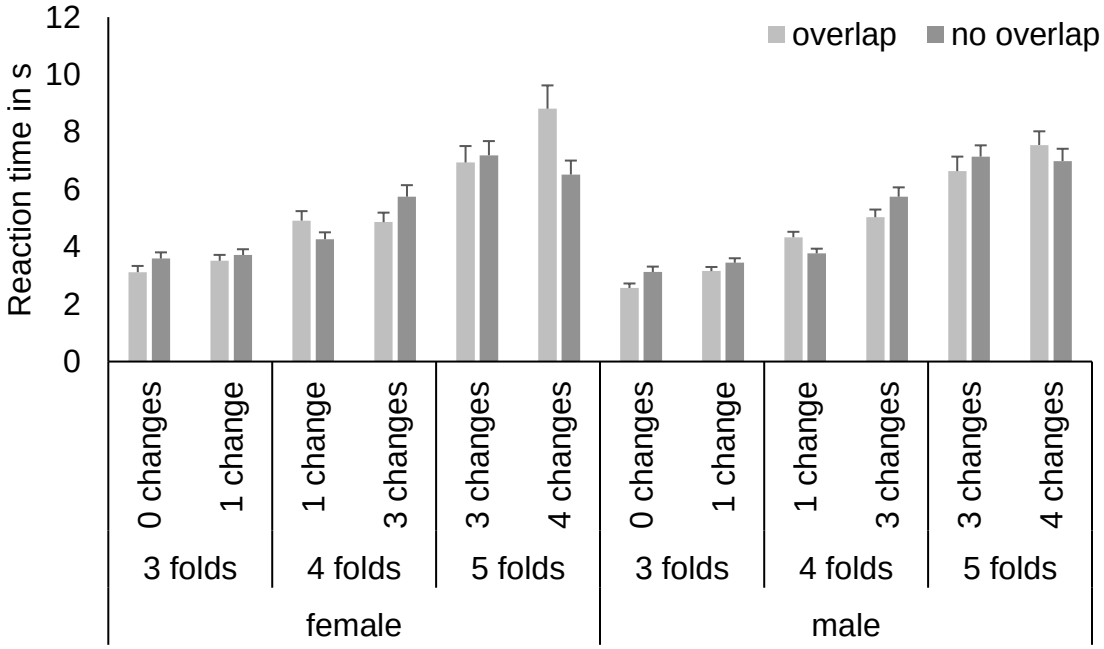

Figure S1. Means and standard errors of reaction times (in s) depending on the number of folds (3, 4, 5), the number of direction changes (0, 1, 2, 3, 4), and whether the highlighted lines overlap in the cube (overlap, no overlap) in female and male participants.

Table S1 Statistical results of the ANOVA on reaction times.

The ANOVA was conducted with the factors sex, overlap, folds, and direction changes. Here, we focus only on effects that include sex which are not described in the manuscript.

	F	*df1, df2*	*p*	η^2_p
sex	0.6	1, 97	.44	.01
sex x overlap	4.9	1, 97	.029	.05
sex x folds	0.1	1.1, 106.1	.75	<.01
sex x changes	1.6	1, 97	.216	.02
sex x overlap x folds	4.5	1.2, 120.7	.027	.05
sex x overlap x changes	2	1, 97	.159	.02
sex x folds x changes	3	1.8, 175.8	.056	.03
sex x overlap x folds x changes	2.8	1.2, 118	.088	.03

2. Error rates

To investigate the effects of sex on reaction times, we calculated an ANOVA with the factors sex (male, female), overlap (overlap, no overlap), folds (3, 4, 5) and direction changes (fewer, more). Means and standard errors of RTs are shown in Figure SM1. Statistical values of the ANOVA are shown in Table SM2. Here, we will focus only on main effects and interactions with the factor sex (which are not described in the manuscript) which were not significant.

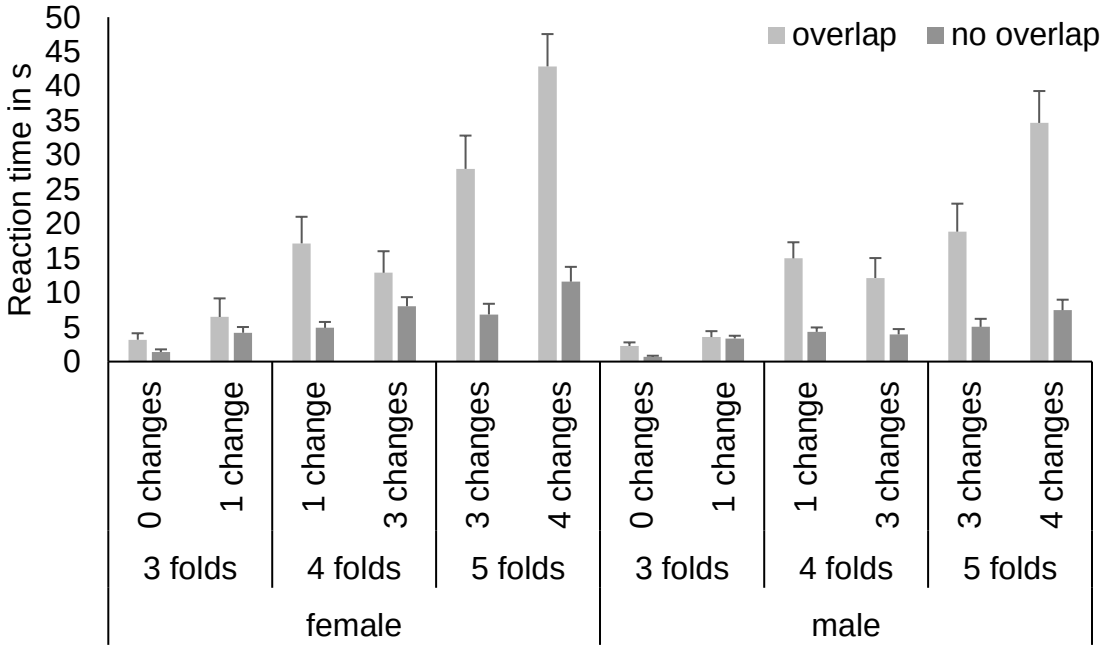

Figure S2. Means and standard errors of error rates (in %) depending on the number of folds (3, 4, 5), the number of direction changes (0, 1, 2, 3, 4), and whether the highlighted lines overlap in the cube (overlap, no overlap) in female and male participants.

Table S2 Statistical results of the ANOVA on error rates.

The ANOVA was conducted with the factors sex, overlap, folds, and direction changes. Here, we focus only on effects that include sex which are not described in the manuscript.

	F	*df1, df2*	*p*	η^2_p
sex	2.7	1, 97	.107	.03
sex x overlap	0.5	1, 97	.494	.01
sex x folds	2.1	1.6, 151.4	.137	.02
sex x changes	0.4	1, 97	.505	.01
sex x overlap x folds	1.2	1.5, 144.4	.288	.01
sex x overlap x changes	0.7	1, 97	.405	.01
sex x folds x changes	<0.1	1.5, 142.8	.939	<.01
sex x overlap x folds x changes	0.5	1.3, 128.7	.518	.01

3. Learning effects

To investigate the effects of sex on learning effects, we calculated ANOVAs with the factors sex (male, female) and time (Session 1, Session 2) on RTs and error rates. Means and standard errors are shown in Figure SM3. Statistical values of the ANOVAs are shown in Table SM3. Here, we will focus only on main effects and interactions with the factor sex (which are not described in the manuscript) which were not significant.

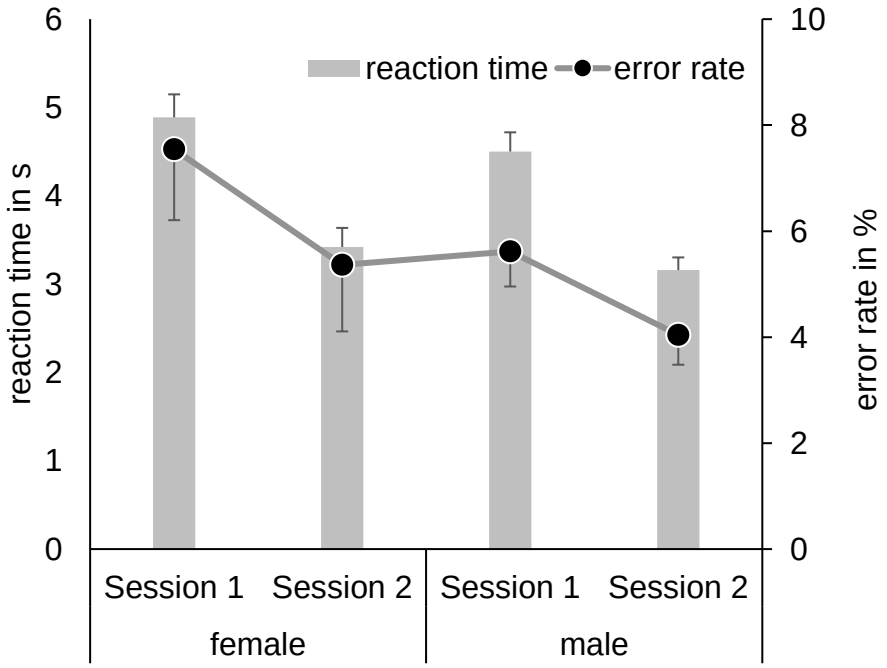

Figure S3. Means and standard errors of reaction times (in s) and error rates (in %) in Session 1 and Session 2, separately for female and male participants.