# Supporting Information

## Mascaro et al. 10.1073/pnas.1305579110

### Results and Additional Analyses

Because paternal caregiving and support have been shown to increase as children get older (1), we tested whether age of the child was related to paternal responsibility and it was not; nor was age of the child related to testosterone levels, testes volume, or β-contrast values in the ventral tegmental area (VTA). We also investigated whether the sex of the child predicted paternal responsibility, testosterone, testes volume, or β-contrast values. Independent sample $t$ tests revealed a trend indicating that fathers of daughters had a more robust VTA response to their child's face [$t(58) = 1.81, P = 0.08$]. Looking more closely, this effect was driven by a significantly more robust response to daughters' sad facial expressions [$t(58) = 2.82, P < 0.01$]. Although this suggests that fathers responded with a stronger drive to nurture daughters, it is important to note that responsibility levels do not indicate that fathers with daughters participated more in care-taking [$t(65) = 0.17, P = 0.87$].

1. Bailey WT (1994) A longitudinal study of fathers' involvement with young children: Infancy to age 5 years. *J Genet Psychol* 155(3):331–339.
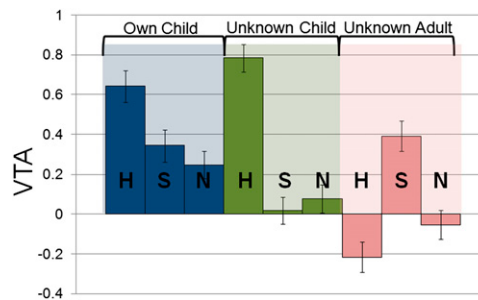
**Fig. S1.** Plot of β-values in the functionally derived VTA regions of interest for each task condition. H, happy; N, neutral; S, sad.
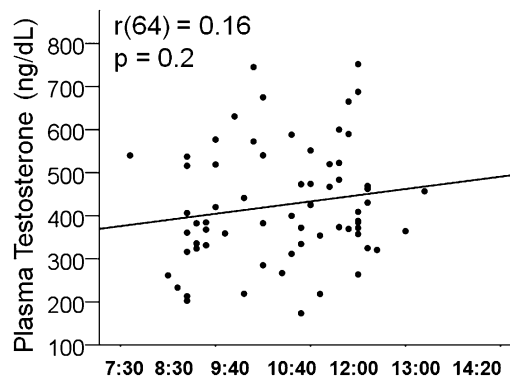


**Fig. S2.** Plot of plasma testosterone values according to the time of day acquired.

## Picture Stimuli



**Fig. S3.** Examples of picture stimuli for each condition.



**Fig. S4.** Schematic of data collected over two study sessions. During session 1 with the father's partner and child, we collected the partner's ratings of the father's level of responsibility and photographs of the child making happy, sad, and neutral facial expressions. During session 2 with the father, we collected demographic and self-report data, blood samples for measurement of plasma testosterone levels, structural and functional MRI scans of the brain, and a structural MRI scan of the testes.



**Fig. S5.** Plot of bivariate correlation between mothers' and fathers' actual responsibility ratings.
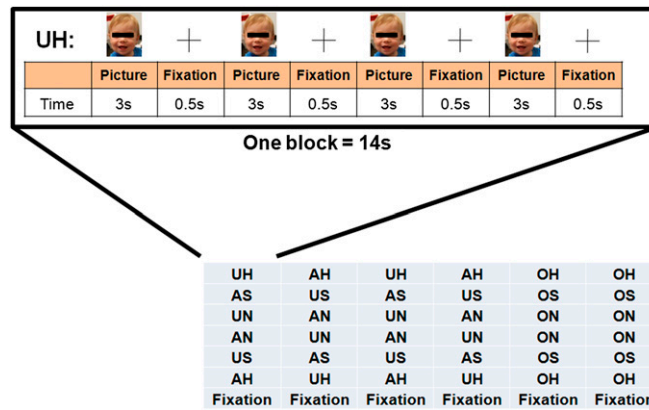
**Fig. S6.** Schematic of child task. AH, unknown adult's happy face; AN, unknown adult's neutral face; AS, unknown adult's sad face; OH, own infant's happy face; ON, own infant's neutral face; OS, own infant's sad face; UH, unknown infant's happy face; UN, unknown infant's neutral face; US, unknown infant's sad face.

**Table S1.  Results of whole-brain exploratory analyses using testosterone and testicular volume as covariates, thresholded at $P < 0.001$**

| Category | Brodmann's Area | x | y | z | r | Voxels |
|---|---|---|---|---|---|---|
| Own Child–Adult: testosterone ($n = 53$) | | | | | | |
| Right superior temporal gyrus, extending into the inferior parietal lobe | 41, 39 | 47 | −32 | 24 | 0.52 | 48 |
| Own Child–Adult: testes volume ($n = 47$) | | | | | | |
| Ventral tegmental area/substantia nigra | | −4 | −26 | −15 | −0.56 | 34 |

**Table S2.  Descriptive statistics of the fathers**

| Variable | n | Minimum | Maximum | Mean | SD |
|---|---|---|---|---|---|
| Age (y) | 70 | 21.0 | 55.0 | 32.7 | 5.61 |
| Total number of kids | 70 | 1 | 4 | 1.86 | 0.82 |
| Testosterone | 66 | 173.7 | 751.8 | 425.1 | 134.6 |
| Height (inches) | 70 | 63.8 | 77.0 | 70.4 | 2.77 |
| Weight (pounds) | 70 | 119 | 319 | 196.2 | 40.7 |
| Total testes volume ($mm^3$) | 55 | 18,358 | 59,665 | 38,064 | 11,183 |