Parent with G_1G_2:

Parent \ Mate	$f(G_1)=p$	$f(G_2)=q$
$f(G_1)$	$f(G_1G_1)=0.5\cdot p$	$f(G_1G_2)=0.5\cdot q$
$f(G_2)$	$f(G_2G_1)=0.5\cdot p$	$f(G_2G_2)=0.5\cdot q$

- Offspring of G_1G_2 parent: $f(G_1G_1)=0.5\cdot p$

$$f(G_1G_2)=0.5\,q+0.5\,p$$
$$=0.5(p+q)=0.5$$

$f(G_2G_2)=0.5\cdot q$

- Mean genotypic value

$$\mu_x=f(G_1G_1)\cdot a+f(G_1G_2)\cdot d+f(G_2G_2)\cdot(-a)$$
$$=0.5p\cdot a+0.5\cdot d-0.5q\cdot a$$
$$=0.5[(p-q)a+d]$$