

Table A1. The hazard ratio (HR) associated with 1-level increase in education (total effect), decomposed into mediated effect (natural indirect effect) and direct effect (natural direct effect) for white men by age

Education levels and effect	White men, younger (≤71y., n=2624)			White men, older (>71y., n=2455)		
	HR	(95%CI)	% mediated	HR	(95%CI)	% mediated
<b>Mediator: Substantive complexity of work</b>						
<i>High school graduate vs. &lt;high school</i>						
Natural direct effect	0.80	(0.72, 0.90)		0.94	(0.89, 0.99)	
Natural indirect effect	1.00	(0.95, 1.06)	-- <sup>a</sup>	0.99	(0.96, 1.02)	-- <sup>a</sup>
Total effect	0.80	(0.70, 0.91)		0.93	(0.87, 0.99)	
<i>Some college vs. high school graduate</i>						
Natural direct effect	0.54	(0.40, 0.71)		0.83	(0.72, 0.96)	
Natural indirect effect	1.08	(0.94, 1.25)	--	0.95	(0.88, 1.02)	-- <sup>a</sup>
Total effect	0.58	(0.46, 0.73)		0.79	(0.70, 0.89)	
<i>College graduate vs. some college</i>						
Natural direct effect	0.84	(0.77, 0.91)		0.94	(0.90, 0.98)	
Natural indirect effect	1.04	(0.98, 1.10)	--	0.98	(0.95, 1.01)	-- <sup>a</sup>
Total effect	0.87	(0.79, 0.95)		0.92	(0.88, 0.96)	
<i>Graduate degree vs. College</i>						
Natural direct effect	0.85	(0.77, 0.93)		0.94	(0.89, 0.98)	
Natural indirect effect	1.05	(0.97, 1.12)	--	0.98	(0.95, 1.01)	-- <sup>a</sup>
Total effect	0.89	(0.78, 1.00)		0.92	(0.87, 0.97)	
<b>Mediator: Hazardous working conditions</b>						
<i>High school graduate vs. &lt;high school</i>						
Natural direct effect	0.83	(0.75, 0.92)		0.96	(0.91, 1.01)	
Natural indirect effect	0.98	(0.93, 1.03)	--	1.00	(0.97, 1.03)	--
Total effect	0.81	(0.72, 0.92)		0.96	(0.91, 1.02)	
<i>Some college vs. high school graduate</i>						
Natural direct effect	0.58	(0.45, 0.76)		0.87	(0.75, 1.00)	
Natural indirect effect	1.00	(0.89, 1.12)	--	0.94	(0.88, 1.00)	29.8%
Total effect	0.58	(0.46, 0.73)		0.81	(0.72, 0.92)	
<i>College graduate vs. some college</i>						
Natural direct effect	0.92	(0.88, 0.95)		0.93	(0.89, 0.98)	
Natural indirect effect	0.98	(0.96, 1.00)	--	0.97	(0.95, 1.00)	29.4%
Total effect	0.90	(0.87, 0.93)		0.91	(0.87, 0.95)	
<i>Graduate degree vs. College</i>						
Natural direct effect	0.91	(0.88, 0.95)		0.93	(0.89, 0.97)	
Natural indirect effect	0.98	(0.95, 1.00)	--	0.96	(0.93, 1.00)	32.1%
Total effect	0.89	(0.85, 0.93)		0.89	(0.85, 0.94)	

Notes. Age, region, and working status at the time of NIOSH module are adjusted for in all models. <sup>a</sup> %mediated is not calculated because the natural indirect effect is not significant.

Table A2. The hazard ratio (HR) associated with 1-level increase in education (total effect), decomposed into mediated effect (natural indirect effect) and direct effect (natural direct effect) for black men by age

Education levels and effect	Black men, younger (≤70y., n=1156)			Black men, older (>70y., n=972)		
	HR	(95%CI)	% mediated	HR	(95%CI)	% mediated
<b>Mediator: Substantive complexity of work</b>						
<i>High school graduate vs. &lt;high school</i>						
Natural direct effect	0.97	(0.84, 1.12)		0.95	(0.88, 1.04)	
Natural indirect effect	0.92	(0.85, 0.99)	73.8%	1.01	(0.96, 1.06)	-- <sup>a</sup>
Total effect	0.89	(0.75, 1.05)		0.96	(0.87, 1.06)	
<i>Some college vs. high school graduate</i>						
Natural direct effect	0.91	(0.61, 1.34)		0.85	(0.68, 1.08)	
Natural indirect effect	0.74	(0.62, 0.89)	71.3%	0.98	(0.86, 1.13)	--
Total effect	0.67	(0.47, 0.95)		0.84	(0.70, 1.00)	
<i>College graduate vs. some college</i>						
Natural direct effect	0.96	(0.84, 1.08)		0.94	(0.87, 1.01)	
Natural indirect effect	0.90	(0.84, 0.97)	68.4%	0.99	(0.94, 1.05)	--
Total effect	0.86	(0.75, 0.99)		0.93	(0.86, 1.00)	
<i>Graduate degree vs. College</i>						
Natural direct effect	0.95	(0.84, 1.09)		0.93	(0.86, 1.01)	
Natural indirect effect	0.90	(0.82, 0.99)	67.4%	0.98	(0.92, 1.05)	--
Total effect	0.85	(0.72, 1.01)		0.92	(0.83, 1.02)	
<b>Mediator: Hazardous working conditions</b>						
<i>High school graduate vs. &lt;high school</i>						
Natural direct effect	0.93	(0.82, 1.05)		0.91	(0.84, 0.99)	
Natural indirect effect	1.01	(0.95, 1.06)	--	0.99	(0.96, 1.03)	--
Total effect	0.93	(0.81, 1.07)		0.90	(0.82, 0.99)	
<i>Some college vs. high school graduate</i>						
Natural direct effect	0.78	(0.53, 1.15)		0.77	(0.63, 0.96)	
Natural indirect effect	0.90	(0.77, 1.05)	--	1.05	(0.94, 1.18)	--
Total effect	0.70	(0.5, 0.98)		0.81	(0.69, 0.97)	
<i>College graduate vs. some college</i>						
Natural direct effect	0.89	(0.79, 1.01)		0.94	(0.88, 1.01)	
Natural indirect effect	0.95	(0.89, 1.02)	--	1.03	(0.98, 1.07)	--
Total effect	0.85	(0.75, 0.96)		0.97	(0.90, 1.04)	
<i>Graduate degree vs. College</i>						
Natural direct effect	0.88	(0.78, 1.00)		0.95	(0.89, 1.02)	
Natural indirect effect	0.94	(0.86, 1.02)	--	1.03	(0.98, 1.09)	--
Total effect	0.83	(0.72, 0.95)		0.98	(0.89, 1.08)	

Notes. Age, region, and working status at the time of NIOSH module are adjusted for in all models. <sup>a</sup> %mediated is not calculated because the natural indirect effect is not significant.

Table A3. The hazard ratio (HR) associated with 1-level increase in education (total effect), decomposed into mediated effect (natural indirect effect) and direct effect (natural direct effect) for white women by age

Education levels and effect	White women, younger (≤69y.,n=2692)			White women, older (>69y.,n=2372)		
	HR	(95%CI)	% mediated	HR	(95%CI)	% mediated
<b>Mediator: Substantive complexity of work</b>						
<i>High school graduate vs. &lt;high school</i>						
Natural direct effect	0.89	(0.76, 1.04)		1.00	(0.94, 1.07)	
Natural indirect effect	0.96	(0.88, 1.04)	-- <sup>a</sup>	1.01	(0.98, 1.05)	--
Total effect	0.85	(0.71, 1.03)		1.01	(0.94, 1.10)	
<i>Some college vs. high school graduate</i>						
Natural direct effect	0.71	(0.48, 1.07)		0.98	(0.80, 1.20)	
Natural indirect effect	0.94	(0.78, 1.15)	--	0.89	(0.80, 0.98)	82.6%
Total effect	0.67	(0.48, 0.94)		0.87	(0.74, 1.02)	
<i>College graduate vs. some college</i>						
Natural direct effect	0.91	(0.81, 1.03)		0.95	(0.89, 1.01)	
Natural indirect effect	0.99	(0.91, 1.07)	--	0.94	(0.91, 0.99)	50.7%
Total effect	0.90	(0.79, 1.03)		0.90	(0.84, 0.95)	
<i>Graduate degree vs. College</i>						
Natural direct effect	0.92	(0.81, 1.05)		0.94	(0.87, 1.00)	
Natural indirect effect	0.99	(0.90, 1.10)	--	0.93	(0.88, 0.98)	51.1%
Total effect	0.92	(0.77, 1.09)		0.87	(0.80, 0.94)	
<b>Mediator: Hazardous working conditions</b>						
<i>High school graduate vs. &lt;high school</i>						
Natural direct effect	0.89	(0.80, 0.98)		0.94	(0.89, 0.99)	
Natural indirect effect	1.00	(0.99, 1.01)	--	1.00	(0.99, 1.01)	--
Total effect	0.89	(0.80, 0.98)		0.93	(0.89, 0.98)	
<i>Some college vs. high school graduate</i>						
Natural direct effect	0.70	(0.51, 0.95)		0.82	(0.70, 0.96)	
Natural indirect effect	1.00	(0.96, 1.03)	--	1.00	(0.97, 1.03)	--
Total effect	0.69	(0.51, 0.95)		0.82	(0.71, 0.95)	
<i>College graduate vs. some college</i>						
Natural direct effect	0.89	(0.80, 0.98)		0.94	(0.89, 0.99)	
Natural indirect effect	1.00	(0.98, 1.01)	--	1.00	(0.99, 1.01)	--
Total effect	0.89	(0.80, 0.98)		0.94	(0.89, 0.99)	
<i>Graduate degree vs. College</i>						
Natural direct effect	0.89	(0.80, 0.98)		0.94	(0.89, 0.99)	
Natural indirect effect	1.00	(0.98, 1.02)	--	1.00	(0.98, 1.02)	--
Total effect	0.89	(0.80, 0.98)		0.94	(0.89, 0.99)	

Notes. Age, region, and working status at the time of NIOSH module are adjusted for in all models. <sup>a</sup> %mediated is not calculated because the natural indirect effect is not significant.

Table A4. The hazard ratio (HR) associated with 1-level increase in education (total effect), decomposed into mediated effect (natural indirect effect) and direct effect (natural direct effect) for black women by age

Education levels and effect	Black women, younger (≤69y. n=2051)			Black women, older (>69y., n=1749)		
	HR	(95%CI)	% mediated	HR	(95%CI)	% mediated
<b>Mediator: Substantive complexity of work</b>						
<i>High school graduate vs. &lt;high school</i>						
Natural direct effect	0.93	(0.81, 1.07)		0.91	(0.83, 1.00)	
Natural indirect effect	0.95	(0.88, 1.03)	-- <sup>a</sup>	0.99	(0.94, 1.04)	--
Total effect	0.89	(0.75, 1.04)		0.90	(0.81, 0.99)	
<i>Some college vs. high school graduate</i>						
Natural direct effect	0.79	(0.53, 1.16)		0.77	(0.60, 0.98)	
Natural indirect effect	0.82	(0.65, 1.03)	--	1.05	(0.88, 1.24)	--
Total effect	0.64	(0.48, 0.86)		0.81	(0.68, 0.95)	
<i>College graduate vs. some college</i>						
Natural direct effect	0.91	(0.81, 1.02)		0.94	(0.87, 1.01)	
Natural indirect effect	0.93	(0.84, 1.02)	--	1.02	(0.95, 1.10)	--
Total effect	0.84	(0.74, 0.96)		0.96	(0.88, 1.05)	
<i>Graduate degree vs. College</i>						
Natural direct effect	0.90	(0.80, 1.02)		0.95	(0.88, 1.03)	
Natural indirect effect	0.92	(0.82, 1.04)	--	1.03	(0.95, 1.12)	--
Total effect	0.83	(0.70, 0.98)		0.98	(0.87, 1.11)	
<b>Mediator: Hazardous working conditions</b>						
<i>High school graduate vs. &lt;high school</i>						
Natural direct effect	0.85	(0.77, 0.93)		0.94	(0.89, 1.00)	
Natural indirect effect	1.00	(0.99, 1.02)	--	1.00	(0.99, 1.00)	--
Total effect	0.85	(0.77, 0.94)		0.94	(0.89, 1.00)	
<i>Some college vs. high school graduate</i>						
Natural direct effect	0.62	(0.46, 0.82)		0.84	(0.70, 1.00)	
Natural indirect effect	1.03	(0.96, 1.11)	--	0.98	(0.95, 1.01)	--
Total effect	0.64	(0.48, 0.84)		0.82	(0.69, 0.98)	
<i>College graduate vs. some college</i>						
Natural direct effect	0.86	(0.78, 0.95)		0.94	(0.88, 1.00)	
Natural indirect effect	1.01	(0.98, 1.05)	--	0.99	(0.98, 1.00)	--
Total effect	0.87	(0.78, 0.97)		0.93	(0.88, 0.99)	
<i>Graduate degree vs. College</i>						
Natural direct effect	0.86	(0.78, 0.96)		0.94	(0.88, 1.01)	
Natural indirect effect	1.02	(0.98, 1.06)	--	0.99	(0.97, 1.00)	--
Total effect	0.88	(0.78, 0.99)		0.93	(0.87, 0.99)	

Notes. Age, region, and working status at the time of NIOSH module are adjusted for in all models. <sup>a</sup> %mediated is not calculated because the natural indirect effect is not significant.