Supplemental Material

Study 1: Analyses for Directed Groups not presented in main text

Directed stereotypes of competitiveness towards boys/girls. For directed stereotypes of competitiveness towards boys, there were main effects of Target Sex [$F(1, 286) = 74.09$, $p < .001$, $\eta_p^2 = .21$] and Target Age [$F(3, 858) = 62.23$, $p < .001$, $\eta_p^2 = .18$], and no significant interaction, $F(3, 858) = 1.93$, $p = .12$, $\eta_p^2 = .007$ (Figure 1; bottom left). Men were generally stereotyped as more competitive than women, towards boys. Younger individuals were also stereotyped as more competitive than older individuals, towards boys (all *p*s < .008). For directed stereotypes of competitiveness towards girls, there was a marginally significant Target Sex X Target Age interaction, $F(3, 858) = 2.60$, $p = .051$, $\eta_p^2 = .009$ (Figure 1; bottom right). Post-hoc contrasts, however, did not reveal any significant differences at the corrected α level. Hence, we focus on examining the significant main effects of both Target Sex [$F(1, 286) = 53.42$, $p < .001$, $\eta_p^2 = .16$] and Target Age [$F(3, 858) = 59.58$, $p < .001$, $\eta_p^2 = .17$]. From this, women were generally stereotyped as more competitive than men, towards girls. Younger individuals were also stereotyped as more competitive than older individuals, towards girls (all *p*s < .04).

Directed stereotypes of aggressiveness towards boys/girls. For directed stereotypes of aggressiveness towards boys, there were main effects of both Target Sex [$F(1, 287) = 106.06$, $p < .001$, $\eta_p^2 = .27$] and Target Age [$F(3, 861) = 60.51$, $p < .001$, $\eta_p^2 = .17$], but no significant interaction [$F(3, 861) = 2.05$, $p = .11$, $\eta_p^2 = .007$] (Figure 2; bottom left). Men were stereotyped as more physically aggressive than women, towards boys, at all ages. Between age groups, 18 year olds were stereotyped as the group most physically aggressive towards boys (all *p*s < .001), followed by 28 and 40 year olds (who did not significantly differ from each other; $p = .99$), and with 60 year olds being the least aggressive (all *p*s < .001).

Finally, for directed stereotypes of aggressiveness towards girls, there were main effects of both Target Sex and Target Age, but qualified by a significant interaction, $F(3, 861) = 4.07$, $p = .007$, $\eta_p^2 = .014$]. Specifically, 18 year-old women were stereotyped as more physically aggressive than 18 year-old men, towards girls ($p = .022$), but there was no stereotyped sex difference at the other ages (all ps > .099).

Study 1: Individual trait analyses for directed stereotypes of Caring, Nurturant, and Helpful

Caring directed stereotype. For directed stereotypes of caring, there was a significant Target Sex X Target Age X Directed Group three way interaction, $F(15, 4290) = 16.21$, $p < .001$, $\eta_p^2 = .054$. We followed-up with Target Sex X Target Age ANOVAs for each Directed Group.

For the directed stereotype of caring towards young men, the main effects of both Target Sex and Target Age were qualified by a significant interaction, $F(3, 858) = 17.45$, $p < .001$, $\eta_p^2 = .057$. Women across all ages were stereotyped as significantly more caring than men, towards young men (Figure S1; top left), with the stereotyped sex difference being larger for stereotypes of 18-28 year olds relative to 40 and 60 year olds (all *p*s < .004).

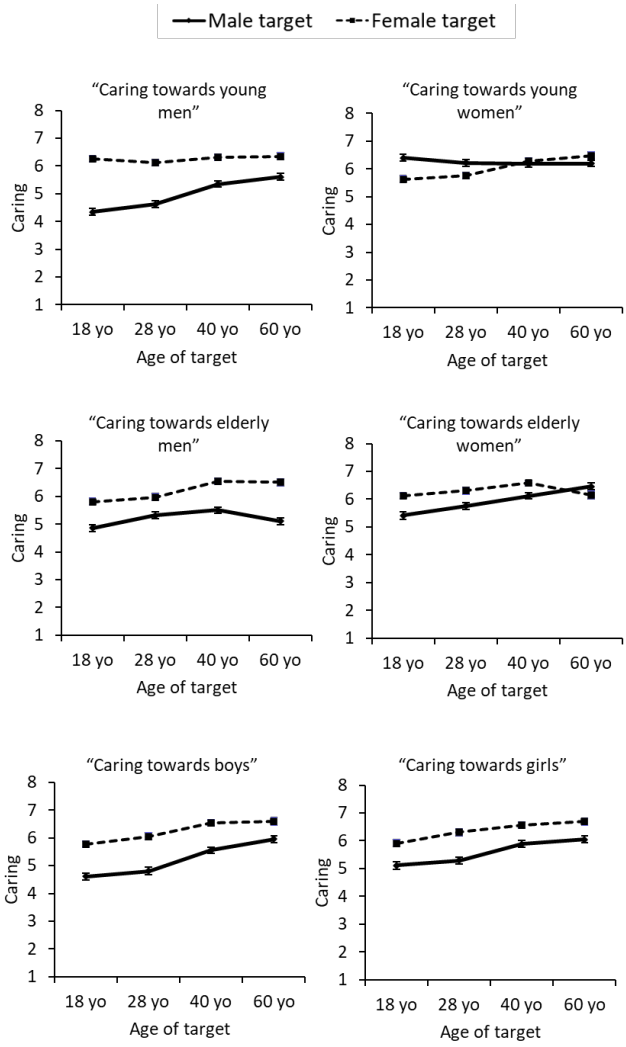

Figure S1. *Directed stereotypes of caring across the six directed groups (Study 1). Top row: stereotypes of care towards young men and women; middle row: stereotypes of care towards elderly men and women; bottom row: stereotypes of care towards young boys and girls. Higher scores represent a stereotype of being more caring towards the directed group. Error bars represent ±1 S.E.*

For the directed stereotype of caring towards young women, there was also a significant Target Sex X Target Age interaction, $F(3, 858) = 13.41$, $p < .001$, $\eta_p^2 = .045$ (Figure S1; top right). From pairwise comparisons, surprisingly, 18 and 28-year-old *men* were stereotyped as more caring than similar-aged women, in terms of care towards young women (both *p*s < .003). This constitutes another reversal of typical sex stereotype patterns (of women as more communal than men). Forty-year-old women and men were not

stereotyped as differing in care towards young women (p = .37), and only 60-year-old women were stereotyped as more caring than 60-year-old-men, towards young women (p = .028).

For the directed stereotype of caring towards elderly men, there was a significant Target Sex X Target Age interaction, $F(3, 858) = 5.24$, p = .001, η_p^2 = .018 (Figure S1; middle left). Women across ages were stereotyped as the more caring sex, towards elderly men (all ps < .001), but this stereotyped sex difference was larger for stereotypes of 60 versus 28 year olds (p < .001). As for the directed stereotype of caring towards elderly women, there was also a significant Target Sex X Target Age interaction, $F(3, 858) = 11.43$, p < .001, η_p^2 = .038 (Figure S1; middle right). Women at 18, 28, and 40 years old were stereotyped to be more caring than same-aged men, towards elderly women (all ps < .001), but this reversed for stereotypes of 60 year olds, with 60-year-old men being stereotyped as more caring than 60-year-old women, towards elderly women (p = .044).

Finally, for directed stereotypes of care towards boys, there was a significant Target Sex X Target Age interaction, $F(3, 858) = 4.45$, p = .004, η_p^2 = .015 (Figure S1; bottom left). Women across ages were stereotyped as the more caring sex, towards boys (all ps < .001), but this stereotyped sex difference was larger for stereotypes of 18-28 year olds versus 60 year olds (all ps < .004). For directed stereotypes of care towards girls, there were main effects of both Target Sex [$F(1, 286) = 66.29$, p < .001, η_p^2 = .19] and Target Age [$F(3, 858) = 30.05$, p < .001, η_p^2 = .095], but no significant interaction, $F(3, 858) = 1.42$, p = .24, η_p^2 = .005. Women were generally stereotyped as more caring than men towards girls, and 48-60 year olds were stereotyped as the age groups most caring towards girls, followed by 28 year olds, and least of all 18 year olds (all ps < .03).

Nurturant directed stereotype. For directed stereotypes of nurturant, there was a significant Target Sex X Target Age X Directed Group three way interaction, $F(15, 4305)$ =

12.81, $p < .001$, $\eta_p^2 = .043$. We followed-up with Target Sex X Target Age ANOVAs for each Directed Group.

For the directed stereotype of nurturance towards young men, the main effects of both Target Sex and Target Age were qualified by a significant interaction, $F(3, 861) = 5.47$, $p < .001$, $\eta_p^2 = .019$. Women across all ages were stereotyped as significantly more nurturant than men, towards young men (Figure S2; top left), with the stereotyped sex difference being larger for stereotypes of 18-28 year olds relative to 60 year olds (both ps $< .005$), and also being larger for stereotypes of 18 year olds relative to 40 year olds ($p = .003$). For the directed stereotype of nurturance towards young women, there was also a significant Target Sex X Target Age interaction, $F(3, 861) = 12.11$, $p < .001$, $\eta_p^2 = .040$ (Figure S2; top right). Twenty-eight-year-old men were stereotyped as more nurturant towards young women than 28-year-old women were ($p = .012$), but this stereotype was reversed for stereotypes of 60 year olds ($p < .001$). There was no significant stereotyped sex difference in nurturance towards young women for 18 and 40 year olds (both ps $> .89$).

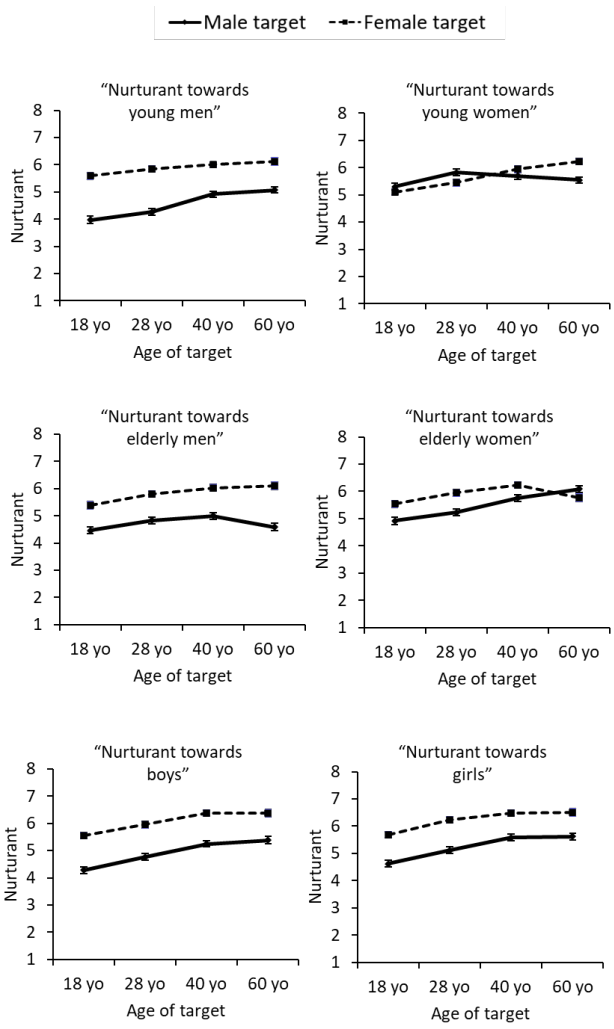

Figure S2. *Directed stereotypes of nurturance across the six directed groups (Study 1). Top row: stereotypes of nurturing towards young men and women; middle row: stereotypes of nurturing towards elderly men and women; bottom row: stereotypes of nurturing towards young boys and girls. Higher scores represent a stereotype of being more nurturing towards the directed group. Error bars represent ±1 S.E.*

For nurturance towards elderly men, there was a significant Target Sex X Target Age interaction, $F(3, 861) = 3.89$, $p = .009$, $\eta_p^2 = .013$ (Figure S2, middle left). Women across ages were stereotyped as the more nurturant sex, towards elderly men (all ps $< .001$), but this stereotyped sex difference was larger for stereotypes of 60 versus 18-28 year olds (both ps $< .007$). As for the directed stereotype of nurturance towards elderly women, there was also a significant Target Sex X Target Age interaction, $F(3, 861) = 12.82$, $p < .001$, $\eta_p^2 = .043$ (Figure S2, middle right). Women at 18, 28, and 40 years old were stereotyped to be more

nurturant than same-aged men, towards elderly women (all *p*s < .001), but this reversed for stereotypes of 60 year olds, with 60-year-old men being stereotyped as more nurturant than 60-year-old women, towards elderly women ($p = .025$).

Finally, for directed stereotypes of nurturance towards boys and towards girls, there were significant main effects of Target Sex [$F(1, 287) = 191.02$ and 118.41, both *p*s < .001, $\eta_p^2 = .40$ and .29 respectively] and Target Age [$F(3, 861) = 34.62$ and 31.38, both *p*s < .001, $\eta_p^2 = .11$ and .10 respectively] (Figure S2, bottom row). Both interaction effects were not significant (both *p*s > .44). Women were generally stereotyped as more nurturant than men, towards children, and 48-60 year olds were stereotyped as the age groups most nurturant towards children, followed by 28 year olds, and least of all 18 year olds (all *p*s < .003).

Helpful directed stereotype. For directed stereotypes of helpfulness, there was also significant Target Sex X Target Age X Directed Group three way interaction, $F(15, 4290) = 8.74$, $p < .001$, $\eta_p^2 = .030$. We followed-up with Target Sex X Target Age ANOVAs for each Directed Group.

For the directed stereotype of helpfulness towards young men, the main effects of both Target Sex and Target Age were qualified by a significant interaction, $F(3, 858) = 7.12$, $p < .001$, $\eta_p^2 = .024$ (Figure S3; top left). Women across all ages were stereotyped as significantly more helpful than men, towards young men (all *p*s < .02), with the stereotyped sex difference being larger for stereotypes of 18-28 year olds relative to 60 year olds (both *p*s < .001). For the directed stereotype of helpfulness towards young women, there was also a significant Target Sex X Target Age interaction, $F(3, 858) = 114.99$, $p < .001$, $\eta_p^2 = .050$ (Figure S3; top right). Both 18 and 28-year-old men were stereotyped as more helpful towards young women than same-aged women (both *p*s < .001), but this stereotype was reversed for stereotypes of 60 year olds ($p = .047$). There was no significant stereotyped sex difference in helpfulness towards young women for 40 year old targets ($p = .96$).

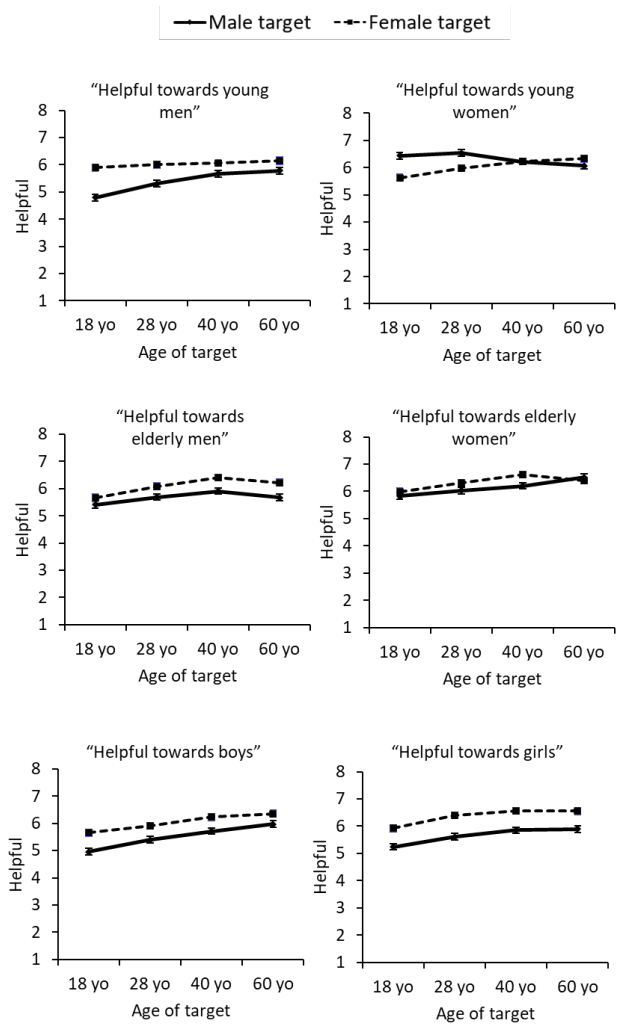

Figure S3. *Directed stereotypes of helpfulness across the six directed groups (Study 1). Top row: stereotypes of helpfulness towards young men and women; middle row: stereotypes of helpfulness towards elderly men and women; bottom row: stereotypes of helpfulness towards young boys and girls. Higher scores represent a stereotype of being more helpful towards the directed group. Error bars represent ±1 S.E.*

For the directed stereotype of helpfulness towards elderly men, there were significant main effects of Target Sex [$F(1, 286) = 28.97$, $p < .001$, $\eta_p^2 = .092$] and Target Age [$F(3, 858) = 11.44$, $p < .001$, $\eta_p^2 = .038$], and no significant interaction, $F(3, 858) = .89$, $p = .45$, $\eta_p^2 = .003$ (Figure S3; middle left). Women were generally stereotyped as more helpful than men, towards elderly men. Eighteen-year-olds were stereotyped as significant less helpful than all the other age groups, towards elderly men (all ps $< .008$). Forty-year-olds were stereotyped as more helpful than 28 year olds ($p = .028$), towards elderly men, and 40 and 60

year olds were not stereotyped to be significantly different in helpfulness (p = .99). For the directed stereotype of helpfulness towards elderly women, there were main effects of both Target Sex and Age, but qualified by a significant Target Sex X Target Age interaction, F(3, 858) = 3.16, p = .024, η_p^2 = .011 (Figure S3; middle right). Women at 28, and 40 years old were stereotyped to be more helpful than same-aged men, towards elderly women (both ps < .05), but there was no stereotyped sex difference for 18 or 60 year old targets (both ps > .30).

Finally, for directed stereotypes of helpfulness towards boys and towards girls, there were significant main effects of Target Sex [F(1, 286) = 48.99 and 68.21, both ps < .001, η_p^2 = .15 and .19 respectively] and Target Age [F(3, 858) = 27.02 and 17.32, both ps < .001, η_p^2 = .086 and .057 respectively]. Both interaction effects were not significant (both ps > .35). Women were generally stereotyped as more helpful than men, towards both boys and girls. For helpfulness towards boys, 48/60 year olds were stereotyped as the age groups most helpful towards boys, followed by 28 year olds, and least of all 18 year olds (all ps < .02). For helpfulness towards girls, 18 year olds were stereotyped as less helpful than all other age groups, towards girls (all ps < .001).

Gossiping directed stereotype. This stereotype was included for exploratory purposes, and was phrased such that participants report how likely they think a Target Group is to "spread harmful gossip" *about* a Directed Group (e.g., "How likely are 18 year old females to spread harmful gossip about young men?").

For directed stereotypes of gossiping, there was a significant Target Sex X Target Age X Directed Group three way interaction, F(15, 4290) = 6.12, p < .001, η_p^2 = .021. We followed-up with Target Sex X Target Age ANOVAs for each Directed Group.

For the stereotype of gossiping about young men, the main effects of both Target Sex and Target Age were qualified by a significant interaction, F(3, 858) = 4.43, p = .004, η_p^2 = .015 (Figure S4; top left). Women across all ages were stereotyped as significantly more

likely to gossip than men, about young men (all *p*s < .001), with the stereotyped sex difference being larger for stereotypes of 28 year olds relative to 60 year olds ($p < .001$). For the directed stereotype of helpfulness towards young women, there was also a significant Target Sex X Target Age interaction, $F(3, 858) = 6.67$, $p < .001$, $\eta_p^2 = .023$ (Figure S4; top right). Women across all ages were stereotyped as significantly more likely to gossip than men, about young women (all *p*s < .001), with the stereotyped sex difference being smaller for stereotypes of 60 year olds relative to all other ages (all *p*s < .005)

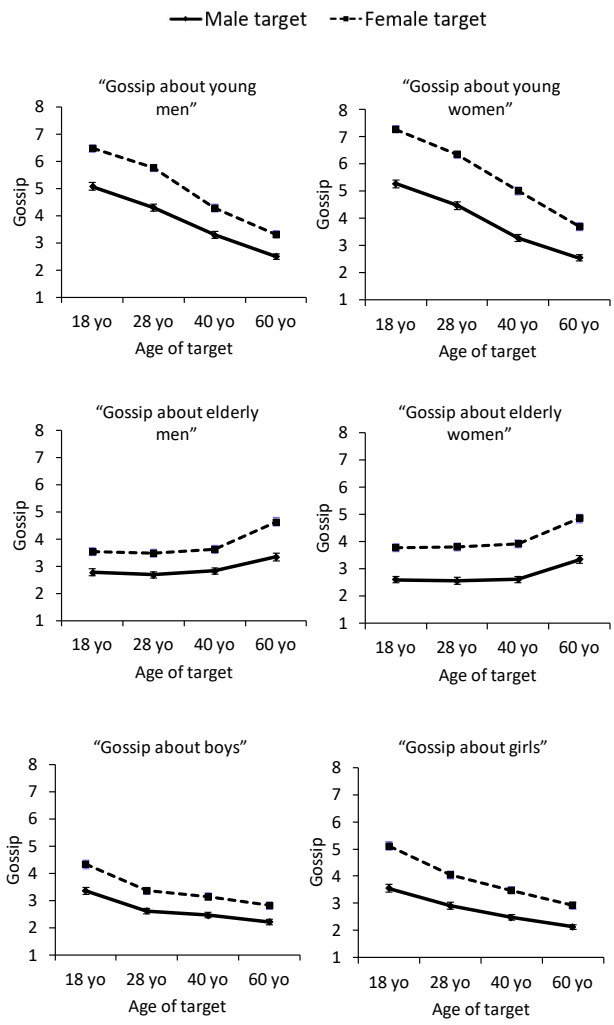

Figure S4. *Directed stereotypes of gossiping across the six directed groups (Study 1). Top row: stereotypes of gossiping about young men and women; middle row: stereotypes of gossiping about elderly men and women; bottom row: stereotypes of gossiping about young boys and girls. Higher scores represent a stereotype of being more likely to gossip about the directed group. Error bars represent ±1 S.E.*

For the directed stereotype of gossiping about elderly men, there was also a significant Target Sex X Target Age interaction, $F(3, 858) = 3.44$, $p = .017$, $\eta_p^2 = .012$ (Figure S4; middle left). Women were stereotyped as more likely to gossip than men across all ages ($p < .001$), about elderly men. This stereotyped sex difference in gossiping about elderly men was larger for stereotypes of 60 year olds relative to all younger ages (all ps < .02). Sixty-year-olds were also stereotyped as significant more likely to gossip than all other age groups, about elderly men (all ps < .001).

For the stereotype of gossiping about elderly women, there were main effects of both Target Sex [$F(1, 286) = 207.34$, $p < .001$, $\eta_p^2 = .42$] and Target Age [$F(3, 858) = 24.60$, $p < .001$, $\eta_p^2 = .079$], and no significant interaction, $F(3, 858) = .99$, $p = .40$, $\eta_p^2 = .003$ (Figure S4; bottom left). In terms of gossiping about elderly women, women were generally stereotyped as more likely to do so than men, and 60 year olds were stereotyped to be more likely to do so that all younger age groups (all ps $< .001$).

Finally, for the stereotype of gossiping about boys, there were main effects of both Target Sex [$F(1, 286) = 86.36$, $p < .001$, $\eta_p^2 = .23$] and Target Age [$F(3, 858) = 57.62$, $p < .001$, $\eta_p^2 = .17$], and no significant interaction, $F(3, 858) = 1.51$, $p = .21$, $\eta_p^2 = .005$ (Figure S4; bottom right). In terms of gossiping about boys, women were generally stereotyped as more likely to do so than men, and 18 year olds were stereotyped to be most likely to do, followed by 28/40 year olds, and least so 60 year olds (all ps $< .009$). For stereotype of gossiping about girls, there was a significant Target Sex X Target Age interaction, $F(3, 858) = 5.54$, $p < .001$, $\eta_p^2 = .019$ (Figure S4; bottom right). Women were stereotyped as more likely to gossip than men across all ages ($p < .001$), about girls, but this stereotyped sex difference was larger for stereotypes of 60 year olds relative to 18/28 year olds (both ps $< .008$).

Study 2: General stereotypes with generic directed element

As mentioned in Footnote 3 of the main text, in the general stereotypes condition of Study 2, besides the items measuring the simple stereotype trait (e.g., "How likely are 18-year-old females to be *competitive*?"), there were also items that had a generic directed element (e.g., "How likely are 18-year-old females to be *competitive towards others*?"). The patterns for the simple stereotypes and the stereotypes with a generic directed element were identical. We present the analyses for the stereotypes with the generic directed element here.

For stereotypes of competitiveness, there were significant effects of both Target Sex [$F(1, 124) = 110.00$, $p < .001$, $\eta_p^2 = .47$] and Target Age [$F(3, 372) = 181.50$, $p < .001$, $\eta_p^2 = .59$], and no significant interaction ($p = .35$). Men were stereotyped to be more competitive than women, and 18 year olds were stereotyped as the most competitive age group, with competitiveness decreasing with each increasing age (all ps $< .004$).

For stereotypes of physical aggressiveness, there was a significant Target Sex X Target Age interaction, $F(3, 372) = 6.00$, $p < .001$, $\eta_p^2 = .046$. Men were stereotyped to be more aggressive than women across all ages (all ps $< .001$), and this stereotyped sex difference was larger for stereotypes of 18-28-year-old targets relative to 60-year-old targets (both ps $< .003$).

For stereotypes of communion, there were significant effects of both Target Sex [$F(1, 124) = 119.56$, $p < .001$, $\eta_p^2 = .49$] and Target Age [$F(3, 372) = 121.04$, $p < .001$, $\eta_p^2 = .49$], and no significant interaction ($p = .87$). Women were stereotyped as more communal than men, and people were stereotyped as significantly more communal with each increasing age (all ps $< .001$), with 60 year olds stereotyped as the most communal age group.

Study 2: Analyses for Directed Groups not presented in main text

Directed stereotypes of competitiveness towards children. For directed stereotypes of competition towards children, there were significant main effects of both Target Sex [$F(1, 128) = 7.24$, $p = .008$, $\eta_p^2 = .054$] and Target Age [$F(3, 384) = 25.43$, $p < .001$, $\eta_p^2 = .16$], but no significant interaction ($p = .14$) (Figure 4; right panel bottom). Men were stereotyped to be more competitive than women, and 18 year olds were stereotyped to be more competitive than all older ages (all ps $< .002$), towards children.

Directed stereotypes of aggressiveness towards children. For directed stereotypes of physical aggressiveness towards children, there were significant main effects of both Target Sex [$F(1, 128) = 14.12$, $p < .001$, $\eta_p^2 = .099$] and Target Age [$F(3, 384) = 10.42$, $p < .001$, $\eta_p^2 = .075$], and no significant interaction ($p = .21$) (Figure 5; right panel bottom). Eighteen year olds were stereotyped as more aggressive than all other age groups (all ps $< .02$), and men were stereotyped as more aggressive than women, towards children.

Study 3: General and directed stereotypes of physical aggressiveness by participant race

We present here analyses that examine general and directed stereotypes of physical aggressiveness, broken down by each participant race. As described in the main text, the Participant Race X Target Group Race X Directed Group Race interaction was non-significant ($p = .067$) for this stereotype. Nonetheless, given potential interest in perceiver race differences for this particular stereotype, we present the patterns by participant race here.

For White participants, there was a significant Target Group Race X Directed Group Race interaction, $F(6, 534) = 3.71$, $p = .001$, $\eta_p^2 = .040$ (Figure S5, top panel). From pairwise comparisons of target group race, within each directed group race, across all general and directed stereotypes, White participants stereotyped Asian Americans as less physically aggressive than European and African Americans (all ps $< .001$), with the latter two stereotyped as not being different from each other (all ps $> .99$).

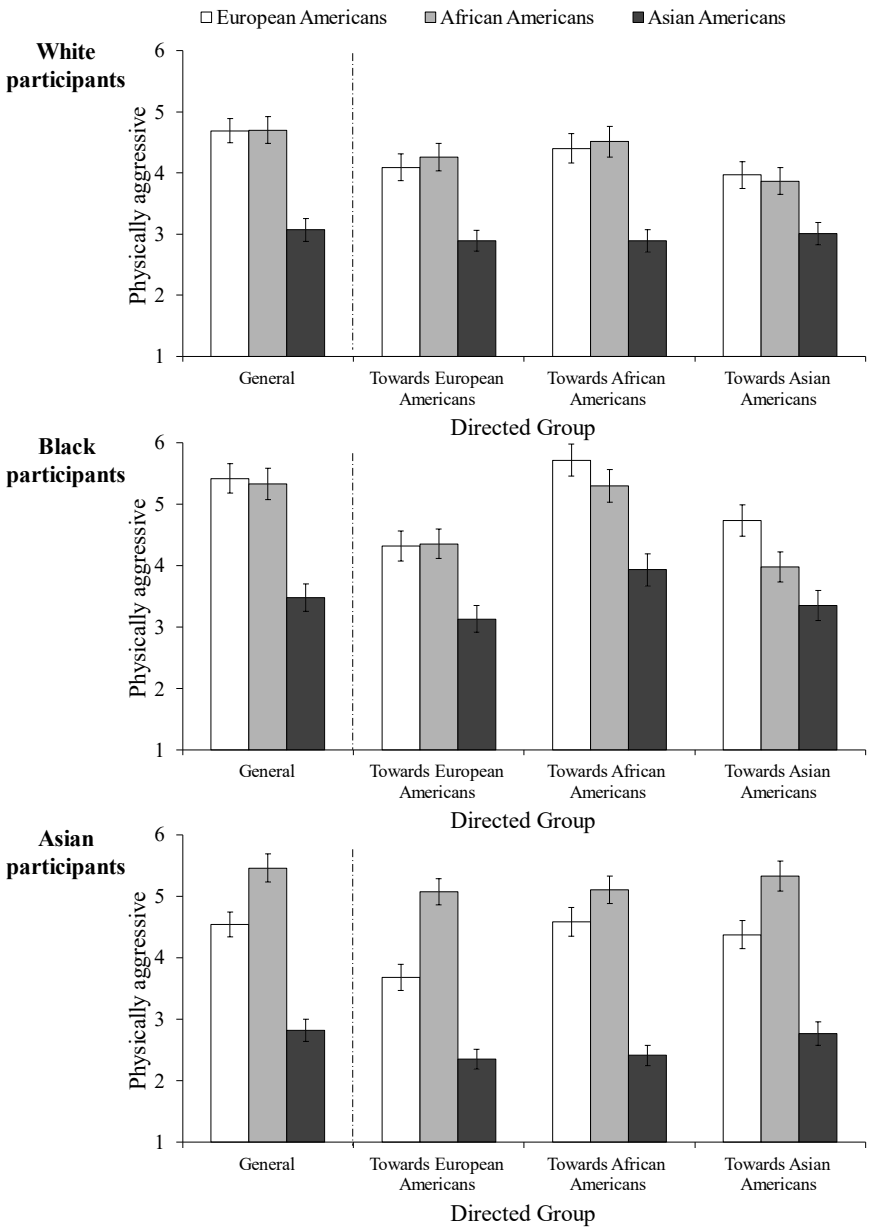

Figure S5. *General vs directed race stereotypes of physical aggressiveness (Study 3). Top panel: White participants' general and directed race stereotypes. Middle panel: Black participants' general and directed race stereotypes. Bottom panel: Asian participants' general and directed race stereotypes. Higher scores represent a stereotype of being more physically aggressive. Error bars represent ±1 S.E.*

For Black participants, there was also a significant Target Group Race X Directed Group Race interaction, $F(6, 540) = 3.92$, $p = .001$, $\eta_p^2 = .042$ (Figure S5, middle panel). For general stereotypes, Black participants stereotyped Asian Americans as less physically aggressive than European and African Americans (both ps < .001), with the latter two

stereotyped as not being different from each other (all *p*s > .99). A similar pattern was observed for directed stereotypes of aggressiveness towards both European and African Americans, with Asian Americans being stereotyped as the least aggressive race (all *p*s < .001), and the other two races not stereotyped as different from each other (both *p*s > .42). For the directed stereotype of aggressiveness towards Asian Americans, Black participants stereotyped European Americans as the most aggressive group, followed by African Americans, and least so Asian Americans (all *p*s < .03).

Finally, for Asian participants, there was also a significant Target Group Race X Directed Group Race interaction, $F(6, 504) = 3.36$, $p = .003$, $\eta_p^2 = .038$ (Figure S5, bottom panel). For general stereotypes, Asian participants stereotyped African Americans as the most physically aggressive race, followed by European Americans, and least so Asian Americans (all *p*s < .001). This pattern was also observed for directed stereotypes of aggressiveness towards European Americans and Asian Americans, with African Americans being stereotyped as the most aggressive, followed by European Americans, and least so Asian Americans (all *p*s < .001). For directed stereotypes of aggressiveness towards African Americans though, Asian participants stereotyped both European Americans and African Americans as equally (and highly) aggressive ($p = .11$) towards African Americans, and more so that Asian Americans were (both *p*s < .001).

Studies 3/4: Are general stereotypes aggregates/prototypes of directed stereotypes?

In the General Discussion, we note two possibilities of the relationship between general and directed stereotypes. One possibility is aggregation. So, when perceivers think about how cooperative African Americans are, they might mentally aggregate across multiple directed stereotypes (i.e., stereotypes of how cooperative African Americans are towards African Americans, towards European Americans, towards Asian Americans, and so on) and form a mental average, which subsequently becomes the general stereotype (of African American cooperativeness). A second possibility is prototyping. So, when perceivers think about how cooperative African Americans are, they might think specifically about how cooperative African Americans are towards European Americans (and not other directed groups). Hence, specific directed groups underlie a general stereotype. The aggregation and prototyping processes are not mutually exclusive, as perceivers could be thinking of a few select directed groups and aggregating across the groups in forming a general stereotype (e.g., how cooperative African Americans are = how cooperative African Americans are towards both European Americans and African Americans).

As an initial exploration of this question, we conducted a series of multiple regressions for the studies in which both general and directed stereotypes were assessed (Studies 3 and 4). In each study, for each participant race, we regress each general stereotype (e.g., general stereotype of African Americans as competitive) on the corresponding three directed stereotypes (e.g., directed stereotypes of African Americans as competitive towards European Americans/African Americans/Asian Americans). Given that there are three directed stereotype predictors, we adopt a more conservative α of .016 to determine significance in each regression. Also, all regressions control for presentation order of directed/general stereotypes. Tables S1 and S2 present the regression coefficients of the

directed stereotypes on each general stereotype, split by participant race and stereotype trait, and for Studies 3 and 4 respectively. We first present and discuss Study 3's patterns.

Table S1. *Regressions of each general stereotype on the three directed stereotypes, for each participant race (Study 3). All regressions control for presentation order of general/directed stereotypes. All numbers are standardized beta coefficients. Coefficients in bold are significant at the corrected α-level of p = .016.*

	White Participants			**Black Participants**			**Asian Participants**		
Directed stereotypes	Competitive general stereotype			Competitive general stereotype			Competitive general stereotype		
	European A.	African A.	Asian A.	European A.	African A.	Asian A.	European A.	African A.	Asian A.
Competitive towards European A	**.52**	**.52**	.08	.20	.09	.24	.25	**.44**	.16
Competitive towards African A.	.01	.19	.12	.16	**.43**	.18	.06	**.26**	-.08
Competitive towards Asian A.	.07	-.16	.30	.26	**.30**	.24	**.35**	.03	**.57**
	Aggressive general stereotype			Aggressive general stereotype			Aggressive general stereotype		
	European A.	African A.	Asian A.	European A.	African A.	Asian A.	European A.	African A.	Asian A.
Aggressive towards European A.	.28	.33	-.10	-.02	**.43**	.18	.06	.29	**.52**
Aggressive towards African A.	.30	.18	**.44**	**.64**	**.45**	**.35**	**.52**	**.30**	.16
Aggressive towards Asian A.	.07	.15	.34	**.23**	-.11	**.29**	.17	**.29**	**.22**
	Cooperative general stereotype			Cooperative general stereotype			Cooperative general stereotype		
	European A.	African A.	Asian A.	European A.	African A.	Asian A.	European A.	African A.	Asian A.
Cooperative towards European A	.12	.28	**.44**	.14	**.27**	-.02	.15	**.27**	.09
Cooperative towards African A.	.11	.11	.16	**.53**	**.31**	**.43**	-.01	.16	.20
Cooperative towards Asian A.	.41	.33	.02	.07	.20	.07	**.61**	**.47**	**.44**
	Friendly general stereotype			Friendly general stereotype			Friendly general stereotype		
	European A.	African A.	Asian A.	European A.	African A.	Asian A.	European A.	African A.	Asian A.
Friendly towards European A.	**.32**	.12	**.53**	.14	**.36**	-.07	**.29**	.17	**.26**
Friendly towards African A.	.07	-.03	.17	**.85**	.15	**.61**	.26	.16	**.32**
Friendly towards Asian A.	.17	**.54**	-.14	**-.33**	**.30**	.09	.26	**.47**	**.32**

For Study 3, there are no clear overarching patterns across the four stereotype traits (Table S1 rows), or within each participant race (Table S1 columns), with patterns supporting both the prototype and aggregate perspectives. For instance, Asian participants' general stereotypes of European Americans' competitiveness is associated only with their directed stereotype of European Americans' competitiveness towards Asian Americans ($\beta = .35$, $p = .009$). In other words, when Asian participants are reporting their stereotype of how competitive European Americans are, they may be implicitly thinking about their stereotypes of how competitive European Americans are *towards Asian Americans* (directed prototype). However, right beside this pattern in Table 1, Asian participants' stereotypes of African Americans' competitiveness shows a different pattern. Specifically, their general stereotype of African Americans' competitiveness is associated with their directed stereotypes of

African Americans' competitiveness towards European Americans (β = .44, p = .002) and towards African Americans (β = .26, p = .011), but not towards Asian Americans (β = .03, p = .85). Hence, when Asian participants are reporting their stereotype of how competitive African Americans are, they may be combining their stereotypes of how competitive African Americans are *towards European and African Americans* (aggregation of two directed stereotypes).

Across all regressions, 47% (17 out of 36) seem to support the prototype perspective, with the general stereotype being significantly predicted by only one directed stereotype. On the other hand, the aggregation perspective—when a general stereotype is predicted by more than one directed stereotype—is supported by 33% of the regressions (12 out of 36).

A few other trends are notable. For stereotypes of both physical aggressiveness and cooperativeness, Black and Asian participants seem to be showing what might be termed a "perceiver group matching effect." For example, Asian participants' general stereotypes of the cooperativeness of each group are all associated with the directed stereotypes of how cooperative the group is *towards Asian Americans* (3 out of 3 associations are significant). So Asian participants' general stereotypes of the cooperativeness of other groups may really be their directed stereotypes of how cooperative other groups are *towards individuals like themselves*. A similar pattern is generally observed with Asian participants' group stereotypes of aggressiveness (2 out of 3 associations significant), and Black participants' group stereotypes of both aggressiveness and cooperativeness (6 out of 6 associations significant).

White participants' stereotypes show the fewest associations across stereotype traits. There is a trend for a similar "perceiver group matching effect" for White participants' stereotypes of competitiveness and friendliness, where their general stereotypes of how competitive/friendly each group is often predicted by how competitive/friendly each group is towards European Americans (4 out of the 6 associations are significant). In general, as can

be seen from Table S1, White participants seem to be exhibiting more of a directed prototype effect, where many general stereotypes are significantly predicted by only one directed stereotype.

For some general stereotypes, it may seem surprising that none of the directed stereotypes are significant predictors. For example, White participants' stereotypes of the general cooperativeness of African Americans is not predicted by any of the three directed stereotypes. Before one concludes that there is no relationship between these general and directed stereotypes, we remind the reader that a more conservative α level (.016) was used to correct for multiple tests. In the above example, if an uncorrected α level was used, both directed stereotypes of African Americans being cooperative towards European Americans (β = .28, p = .041) and towards Asian Americans (β = .33, p = .018) would be significant predictors of the general stereotype.

Finally, there is an unexpected significant *negative* association in the regression for Black participants' stereotypes of European Americans' friendliness. Specifically, for Black participants, their general stereotype of European Americans' friendliness is positively predicted by their directed stereotype of European Americans being friendly towards African Americans (β = .85, p < .001). This is the perceiver group matching effect. However, there is also a significant *negative* association between Black participants' directed stereotype of European Americans being friendly towards *Asian Americans* and their general stereotype of European Americans (β = -.33, p = .008). In other words, the more friendly Black participants think that European Americans are towards Asian Americans, the *less* generally friendly they think European Americans are. This is a suppressor effect, as when regressed independently, the directed stereotype (of friendliness towards Asian Americans) is a significant positive predictor of the general stereotype (β = .35, p < .001). Hence, the association of the directed stereotype (of friendliness towards Asian Americans), with the general stereotype, reverses in

sign when included in a regression with the other significant directed stereotype (of friendliness towards African Americans). Given that this is the only effect of such nature observed in the study, we refrain from interpreting it.

We conducted a similar set of analyses for Study 4 (Table S2 below). Like Study 3, both prototype and aggregate perspectives were supported. Across regressions, 47% (17 out of 36 regressions) support the prototype perspective, with the general stereotype being significant predicted by only one directed stereotype, and 31% (11 out of 36) support the aggregation perspective, with the general stereotype being predicted by more than one directed stereotype. These percentages are very similar to Study 3.

Table S2. *Regressions of each general stereotype on the three directed stereotypes, for each participant race/ethnicity. All regressions control for presentation order of general/directed stereotypes. All numbers are standardized beta coefficients. Coefficients in bold are significant at the corrected α-level of p = .016.*

	White Participants			**Hispanic Participants**			**Asian American Participants**		
Directed stereotypes	Competitive general stereotype			Competitive general stereotype			Competitive general stereotype		
	White A.	Latino A.	Asian A.	White A.	Latino A.	Asian A.	White A.	Latino A.	Asian A.
Competitive towards White A.	**.31**	**.34**	.00	**.22**	**.44**	**.47**	.16	**.37**	-.04
Competitive towards Latino A.	.07	**.27**	-.19	.12	**.25**	-.04	.07	.13	-.05
Competitive towards Asian A.	.24	-.03	**.73**	**.25**	-.05	.03	.24	-.13	**.56**
	Aggressive general stereotype			Aggressive general stereotype			Aggressive general stereotype		
	White A.	Latino A.	Asian A.	White A.	Latino A.	Asian A.	White A.	Latino A.	Asian A.
Aggressive towards White A.	.17	**.34**	.33	.02	**.24**	.23	**.18**	**.33**	.27
Aggressive towards Latino A.	.24	**.29**	.29	**.29**	**.36**	.18	.23	**.36**	.20
Aggressive towards Asian A.	.23	.01	-.07	.18	-.01	.12	**.31**	-.10	.18
	Cooperative general stereotype			Cooperative general stereotype			Cooperative general stereotype		
	White A.	Latino A.	Asian A.	White A.	Latino A.	Asian A.	White A.	Latino A.	Asian A.
Cooperative towards White A.	.14	.03	.09	.05	.03	.10	.11	**.27**	**.22**
Cooperative towards Latino A.	**.44**	**.28**	.22	**.56**	**.30**	**.22**	.17	.02	.04
Cooperative towards Asian A.	-.03	.18	.17	-.14	**.24**	.08	.11	**.29**	**.22**
	Friendly general stereotype			Friendly general stereotype			Friendly general stereotype		
	White A.	Latino A.	Asian A.	White A.	Latino A.	Asian A.	White A.	Latino A.	Asian A.
Friendly towards White A.	.17	**.44**	.11	.06	.08	-.02	-.12	.11	-.07
Friendly towards Latino A.	.20	.06	**.56**	**.45**	**.30**	**.42**	.11	.01	**.43**
Friendly towards Asian A.	.19	-.05	-.09	.03	**.30**	.04	**.44**	**.33**	.05

Some trends include an (imperfect; see Footnote 6 in main text) perceiver group matching effect for Hispanic participants' stereotypes of cooperativeness, friendliness, and aggressiveness. Specifically, Hispanic participants' general stereotypes of the cooperativeness/friendliness/aggressiveness of each group were associated with the directed

stereotypes of how cooperative/friendly/aggressive the group is *towards Latino Americans* (8 out of 9 associations are significant). A similar, but weaker, perceiver group matching effect is also observed with Asian American participants' stereotypes of the cooperativeness and friendliness of each group (4 out of 6 associations significant).

Interestingly, like in Study 3, White participants' stereotypes show the fewest associations across stereotype traits.

In summary, like in Study 3, there is similar evidence supporting the ideas that general stereotypes are potentially aggregates of directed stereotypes, or accessing specific directed prototypes.

Study 4: Exploratory analyses of general/directed stereotype patterns by monoracial/mono-ethnic versus multiracial/multi-ethnic participants

For the three participant races/ethnicities of focus, we coded for whether participants reported identifying only with the focal race/ethnicity (i.e., White, Hispanic, Asian American) or if they also identified with other races/ethnicities. For White, Hispanic, and Asian American participants, we then conducted a 2 (Participant Monoracial/mono-ethnic status) X 3 (Target Group: Asian American/Latino American/White American) X 4 (Directed Group: General/Asian American/Latino American/White American) ANOVA on each stereotype trait.

We focus on potential significant higher order three-way interactions (given that the main analyses always showed significant Target Group X Directed Group interactions). There were no significant three-way interactions (all *p*s > .11), except for one. Hence, in general, whether participants' were mono- or multiracial/multi-ethnic did not significantly influence the observed Target Group X Directed Group patterns.

The one interaction that was significant was for stereotypes of cooperativeness, where White participants showed a significant three-way interaction, $F(6, 720) = 2.35$, $p = .030$, $\eta_p^2 = .019$. When examining the patterns separately for monoracial/mono-ethnic versus multiracial/multi-ethnic White participants, similar patterns were generally observed (Figure S6). Where differences occurred were particularly with the directed stereotype of cooperativeness towards Latino Americans. Where mono-racial/ethnic Whites stereotyped White and Asian Americans as no different in cooperativeness towards Latino Americans ($p = .99$), multi-racial/ethnic Whites stereotyped Asian Americans as significantly more cooperative than White Americans ($p < .001$), towards Latino Americans.

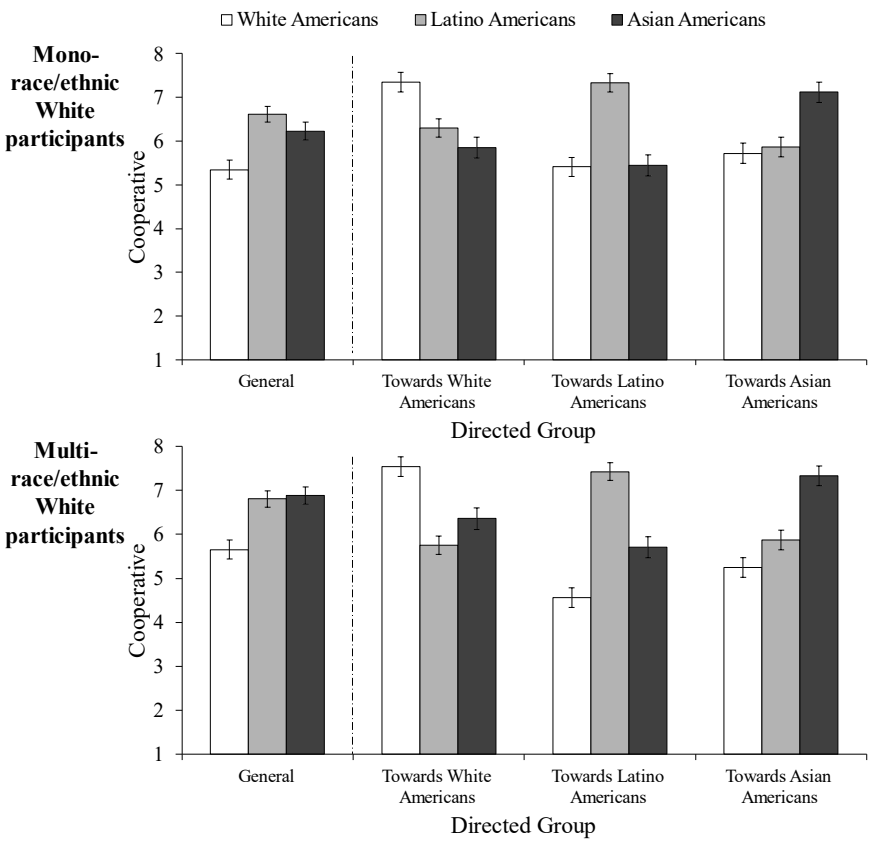

Figure S6. *General vs directed group stereotypes of cooperativeness (Study 4). Top panel: Mono-race/ethnic White participants. Bottom panel: Multi-racial/ethnic White participants. Higher scores represent a stereotype of being more cooperative. Error bars represent ±1 S.E.*