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Poor Toddlers Feel Less Pain? Application of Class-Based Pain Stereotypes in Judgments of Children

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Abstract

Across four studies, we investigated whether perceptions of children's pain are influenced by their socioeconomic status (SES). We found evidence that children with low SES were believed to feel less pain than children with high SES (Study 1), and this effect was not moderated by child's age (Study 2). Next, we examined life hardship as a mediator of this effect among children, finding that children with low SES were rated as having lived a harder life and thus as feeling less pain (Study 3). Finally, we examined downstream consequences for hypothetical treatment recommendations. We found that participants perceived children with low SES as less sensitive to pain and therefore as requiring less pain treatment than children with high SES (Study 4). Thus, we consistently observe that stereotypes of low-SES individuals as insensitive to pain may manifest in judgments of children and their recommended pain care. Implications of this work for theory and medical practice are discussed.

Keywords

children, socioeconomic status, pain perception, stereotyping, health disparities

Socioeconomic status (SES) is often defined by the combination of one's social and economic status as measured by education, income, and occupation (Baker, 2014; Evans et al., 1997). Importantly, across contexts, individuals with relatively low SES are negatively evaluated, stigmatized, and discriminated against. According to the Stereotype Content Model, individuals with relatively low SES may be ascribed low-competence and low-warmth traits (Fiske et al., 2002) that characterize contemptuous prejudice and may elicit both active attack and passive neglect behaviors (Cuddy et al., 2008). Cozzarelli and colleagues (2001) offer support for this theorizing finding that participants endorsed negative traits like lazy, dirty, and unmotivated as more characteristic of individuals who were poor than middle class. Such class-based ascriptions can have meaningful consequences; individuals with lower SES experience poorer educational outcomes (see Walpole, 2003 for review), harsher criminal sentencing decisions (see Mazzella & Feingold, 1994 for meta-analysis), and, critical to the current work, suboptimal medical treatment and health outcomes (see Luo & Waite, 2005 for review).

Class-based disparities in health care wherein individuals with lower SES receive poorer and less effective care than those with higher SES are well-documented (e.g., Bristow et al., 2013; Haas et al., 1994; Le et al., 2008). Although class-based disparities in health care span subfields, among the best documented are those in the treatment of pain (e.g., Brekke et al., 2002; Gebauer et al., 2017; Joynt et al., 2013; Molina et al., 2015). To this point, Joynt and colleagues (2013) analyzed data from 184 million medical visits and found patients with lower SES reliably received less intensive pain treatment than their higher SES counterparts. Recent social psychological work highlighted a potential provider-level mechanism underlying these disparities (Summers et al., 2021). Across 10 studies, undergraduate, online, and medical provider participants judged targets with low SES (manipulated via occupation or access to resources) as less sensitive to pain than targets with high SES. Furthermore, this insensitivity stereotype mediated class-based biases in pain care recommendations in both lay participant and medical provider samples.

Previous research suggests that, similar to adults, children with low SES suffer poorer physical health outcomes than children with high SES (Chen et al., 2002; Chen et al., 2006; Starfield et al., 2002). Relevant to pain, a review of 41 articles published between 1991 and 2009 revealed that children with low SES reported higher prevalence of chronic pain than children with high SES (King et al., 2011). Childhood is characterized by necessary yet painful

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medical procedures (e.g., vaccinations, surgeries), making pediatric pain management important (Cohen et al., 2014; Schechter et al., 2007). Further, as children have less autonomy and must rely on adults (e.g., doctors, parents) to determine and advocate for appropriate care (Cohen et al., 2008), biases in pain assessment are particularly concerning for young patients.

There is reason to expect SES–pain stereotypes documented in adults (Summers et al., 2021) could influence judgments of children. Indeed, group stereotypes expressed toward adults may be similarly applied to children (Fabes & Martin, 1991; Goff et al., 2014; Jacobs & Eccles, 1992; Tiggeman & Anesbury, 2000; Todd et al., 2016). For example, Todd and colleagues (2016) found that white participants categorized threatening objects faster and nonthreatening objects slower after viewing a black relative to white child's face, an effect consistent with stereotypes associating black men with threat. Relevant to pain, researchers found that participants rated girls as more sensitive to pain and less stoic than boys (Cohen et al., 2014; Earp et al., 2019), mirroring well-documented effects in judgments of men and women's pain (Zhang et al., 2021; see Lloyd et al., 2020 for review). However, there is also reason to believe SES–pain stereotypes may be attenuated in judgments of children. Children tend to be evaluated benevolently and as needing protection (see Montepare & Zebrowitz, 1998 for review), which could buffer against SES–pain sensitivity biases

Researchers studying pain sensitivity biases argue that perceptions of life hardship underlie pain sensitivity stereotypes (Hoffman & Trawalter, 2016; Summers et al., 2021; Trawalter et al., 2012). That is, to the extent that black adults and low-SES adults were rated as having lived a hard life they were also rated as less sensitive to pain than white (Trawalter et al., 2012) and high-SES (Summers et al., 2021) adults. Although hardship beliefs appear to be pervasive across both race (Trawalter et al., 2012) and SES (Summers et al., 2021), understanding whether hardship beliefs are applied to children's pain is a theoretically interesting question. For example, if perceivers conceptualize SES–hardships as only indirectly impacting children, similar to some psychologists' theorizing in the Family Stress Model (e.g., Masarik & Conger, 2017), or if perceivers focus on length of hardship experiences, then the application of pain stereotypes may be attenuated for children or moderated by target age. However, if perceivers conceptualize SES–hardships as directly impacting children, in line with updated theorizing in the Family Stress Model (e.g., Chzhen et al., 2022), or focus on just the experience of hardship rather than the length of hardship, then pain stereotypes may similarly be applied to children and may not be moderated by target age. Regardless, testing whether pain stereotypes are applied to children and operate through a hardship mechanism is of theoretical importance.

The goal of the current work is to empirically test whether perceivers apply SES-based pain stereotypes to children. Psychologists have long been interested in stereotype application (e.g., Devine, 1989; Gilbert & Hixon, 1991), and though some research has considered whether perceivers apply race and gender stereotypes to children (e.g., Cohen et al., 2014; Earp et al., 2019; Goff et al., 2014; Todd et al., 2016), there is a dearth of work investigating the application of SES-based stereotypes to children. Understanding whether perceivers apply SES-based stereotypes to children is particularly interesting given that SES is not necessarily stable across one's lifespan and may not be perceived as stable. To this point, several studies found that American participants tended to overestimate upward social class mobility (Davidai & Gilovich, 2015; Davidai & Gilovich, 2018; Kraus & Tan, 2015). Thus, if SES is perceived as malleable, it seems logical that perceivers may refrain from applying SES-based stereotypes to children. However, perceivers do not always use logic when forming judgments and instead rely on heuristics (see Kahneman, 2003 for review) which may engender stereotyping children consistent with their adult SES group membership. The current work provides a theoretically interesting investigation of the application of SES–pain sensitivity stereotypes to young children and simultaneously affords practical insights into a potential provider-level contributor to unequal pain treatment of children varying in SES.

Overview

We present four experiments examining whether SES–pain stereotypes are applied to children (Studies 1–4), operate through a mechanism similar to that observed among adult targets (Study 3), and inform hypothetical pain treatment recommendations (Study 4). To this end, we adapted Summers and colleagues' (2021) methodology but used child rather than adult targets: Participants viewed school profiles depicting children with low and high SES and rated how much pain the child would feel following injuries.

Study 1

In Study 1, participants viewed low- and high-SES elementary school profiles and evaluated each student's pain sensitivity. We hypothesized that participants would rate children with low SES as less sensitive to pain than children with high SES.

Method

For this and the following studies, all measures, manipulations, and exclusions are disclosed. Measures not central to the article are reported in the Supplemental Materials. All data were collected prior to analyses. Data and materials

Table 1. Demographic Breakdown of Participants' Self-Reported Race and Sex for Studies 1–4

Study	Racial breakdown	Sex breakdown
Study 1	1 American Indian/Alaska Native 9 Asian 16 black/African American 96 white 4 Latino/a	75 Male 56 Female
Study 2	2 American Indian/Alaska Native 31 Asian 33 black/African American 132 white 5 Latino/a 1 Chose not to respond	135 Male 68 Female 1 Nonbinary femme 1 Did not wish to disclose 1 Chose not to respond
Study 3	3 American Indian/Alaska native 10 Asian 5 black/African American 152 white 8 Latino/a 12 Bi- or multiracial (2 Asian/white, 1 black/white, 1 white/Asian/Pacific Islander, 2 Asian American, 1 white/Hispanic, 1 ChicanX/white, 1 Latina/Pacific Islander, 1 black/white/Middle East, 1 white/Latina, 1 Japanese/white) 6 Self-reported (1 Indigenous Mapuche, 1 Middle Eastern, 1 Arab/North African, 1 Nicaraguan, 1 Eurasian, 1 I don't know) 5 Did not wish to disclose	72 Male 127 Female 2 Did not wish to disclose
Study 4	3 American Indian/Alaska Native 14 Asian 26 black/African American 142 white 7 Latino/a 2 Bi- or multiracial (1 Japanese/white, 1 Asian/Caucasian) 1 Did not wish to disclose 1 Chose not to respond	125 Male 70 Female 1 Chose not to respond

are openly accessible (https://osf.io/2xbaj/?view_only=60ab1a6bb36d44b39165c7a213e584ee).

Participants. We aimed to match Summers and colleagues' (2021) Study 1a sample size ($N = 126$). In actuality, 131 American participants were recruited from Amazon's Mechanical Turk in December 2018. A sensitivity analysis specifying a two-tailed dependent means *t*-test revealed that this sample could detect a small effect ($d = 0.25$) or greater with 80% power (G*Power V3.1; Faul et al., 2007). Participants identified primarily as male (75) and white (96; see Table 1 for more detail regarding demographics), and ranged in age from 20 to 70 years ($M_{age} = 34.18$; $SD_{age} = 9.04$). No participants were excluded from analyses.

Procedure. Participants viewed two school profiles (Figure 1) in random order: one child from a low-SES household and one from a high-SES household. Profiles contained images of the purported students with accompanying information (e.g., first name). Images were two neutrally expressed white male exemplars from the Child Affective Facial Expression (CAFE) set (LoBue, 2014; LoBue & Thrasher, 2015). SES–image pairings were counterbalanced between participants. Some information was occluded (e.g., social security number) to bolster our cover story. SES was manipulated via school type (public or private), school name (Kramer Elementary or McGuffey Montessori), and household income ($12,523 or $109,578). Household income values were selected based on the 10th and 90th percentile in the United States in 2016 (Kochhar & Cilluffo, 2018).

Participants viewed each school profile and rated the amount of pain they anticipated the child to feel in 18 situations on a 4-point scale (1 = *not painful* to 4 = *extremely painful*; Trawalter et al., 2012). Responses to all injuries were averaged to create a composite perceived pain sensitivity score ($M = 2.67$; $SD = 0.46$; $\alpha = .92$). Higher values indicate greater perceived pain sensitivity.

Participants then reported their own pain sensitivity on the same scale ($M = 2.52$; $SD = 0.53$; $\alpha = .89$), and completed a demographics questionnaire identifying objective SES (i.e., household income), subjective SES (i.e., ranking in society; Adler et al., 1994), age, race, sex, primary

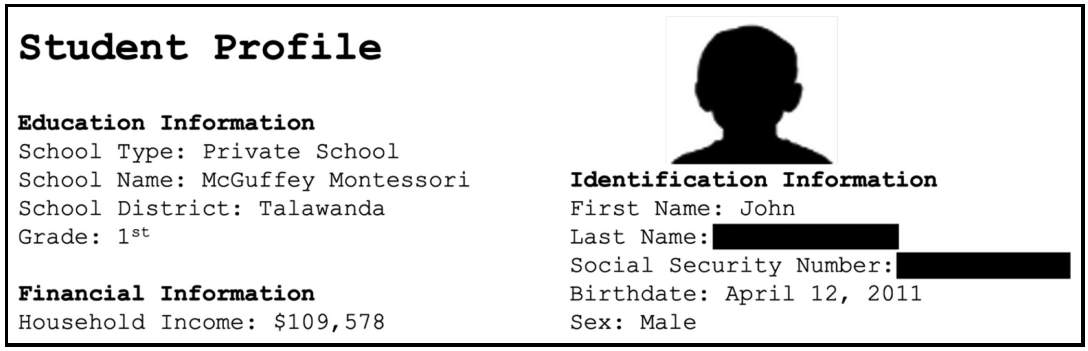

Figure 1. Example High-SES Student Profile.
Note. The target image has been removed in accordance with CAFE stimulus set's sharing requirements. See Supplemental Materials for a list of target images used. SES = socioeconomic status; CAFE = Child Affective Facial Expression.

language, and nationality. Participants' SES was assessed as a moderator of effects of target SES on pain sensitivity judgments. However, in previous work documenting SES–pain stereotypes, participants' SES did *not* moderate target SES effects (Summers et al., 2021); therefore, we did not have *a priori* predictions. Across studies, participants' SES never significantly qualified the effect of target SES on pain judgments; these analyses are included in the Supplemental Materials.

Results and Discussion

A paired-samples *t*-test comparing pain sensitivity ratings across target SES indicated that the child with low SES ($M = 2.63$; $SD = 0.55$) was rated as feeling significantly less pain than the child with high SES ($M = 2.71$; $SD = 0.47$), $t(130) = 2.11$, $p = .037$, 95% CI [0.01, 0.17], $d_z = 0.18$[1]; Figure 2—Study 1.[2]

Study 2

In Study 2, we examined whether application of SES–pain sensitivity stereotypes depends on child age. Although there is a dearth of work examining the application of class-based stereotypes to children, the race-based stereotype literature provides conflicting evidence regarding whether stereotypes are extended to children. For example, some work has shown that race-based threat stereotypes may be applied to 5-year-old black boys (Todd et al., 2016). Yet another experiment found that application of negative stereotypic traits (e.g., hostile, irresponsible) to black children increased with child's age (Small et al., 2012). Finally, Goff and colleagues (2014) found that black, relative to white, boys were seen as less innocent and more culpable in a criminal context; however, this was not true for targets under age 10. Thus, a boundary condition of age may emerge for class-based stereotypes; however, given the conflicting evidence, we remained agnostic in our predictions. We tested this possibility by including both first-grade (6–8 years old) and preschool (3–4 years old) targets varying in SES.

Method

Participants. We relied on a small effect size ($d = 0.20$) to estimate sample size using G*Power (V3.1; Faul et al., 2007). This analysis suggested we needed 200 participants to obtain 80% power for a repeated measures analysis of variance (ANOVA). In actuality, 206 American participants were recruited via CloudResearch (Litman et al., 2016) in May 2020. Participants identified primarily as male (135) and white (132; see Table 1), and ranged in age from 21 to 78 years ($M_{age} = 37.95$; $SD_{age} = 11.86$). No participants were excluded from analyses.

Procedure. Participants viewed eight school profiles in random order: two first graders (age 6–8 years) from low-SES households, two first graders from high-SES households, two preschoolers (age 3–4 years) from low-SES households, and two preschoolers from high-SES households. The first-grade profiles included images of the four oldest (age 6–8 years) white male exemplars and the preschool profiles included images of the four youngest (age 3–4 years) white male exemplars from the CAFE stimulus set (LoBue, 2014; LoBue & Thrasher, 2015). Low- and high-SES profiles were created for each exemplar but were counterbalanced between participants. Again, SES was manipulated via school type (public or private), school name (Greenwood Elementary or Aspen Academy), and household income (5th–20th or 80th–95th income percentiles; Kochhar & Cilluffo, 2018).

Participants rated each child's pain sensitivity (Trawalter et al., 2012; $M = 2.68$, $SD = 0.39$, $\alpha = .93$). Participants then completed the self-pain sensitivity measure ($M = 2.52$; $SD = 0.53$, $\alpha = .89$), followed by a demographic questionnaire identifying objective and subjective SES, age, race, sex, primary language, and nationality.

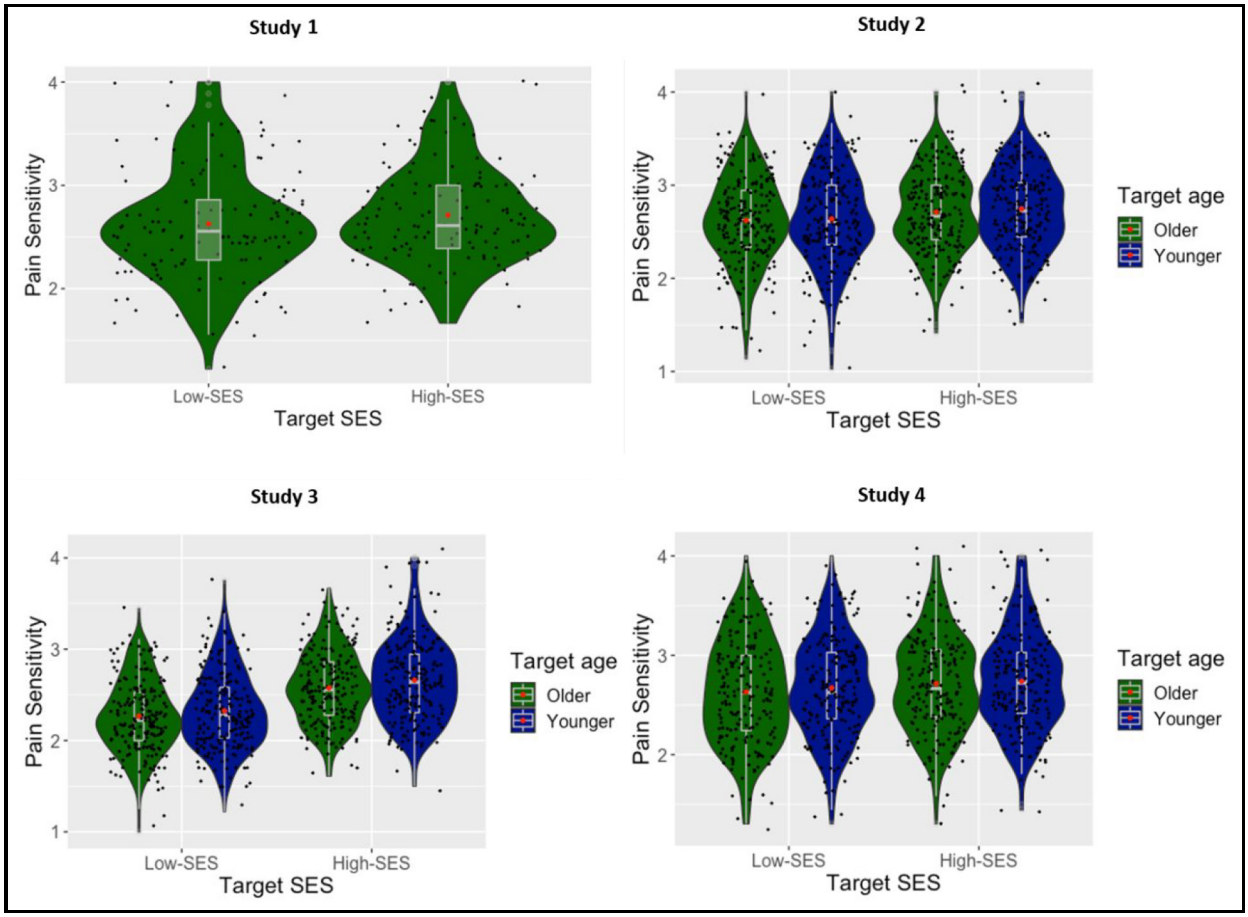

Figure 2. Violin Plots Depicting the Distribution of Pain Sensitivity Ratings Across Target SES (Studies 1–4) and Target Age (Studies 2–4; Higher Values = More Pain Sensitivity).

Note. Red dots indicate the mean of pain sensitivity judgments, whereas the black dots indicate jittered individual-level data points. SES = socioeconomic status (See the online article for the color version of this figure).

Results and Discussion

A 2 (SES: low vs. high) × 2 (age: preschool vs. first grade) repeated measures ANOVA yielded a significant main effect of target SES, indicating that targets with low SES (M = 2.63; SD = 0.45) were rated as feeling less pain than targets with high SES (M = 2.73; SD = 0.41), $F(1,205)$ = 14.93, $p < .001$, 95% CI [0.05, 0.15], η_p^2 = 0.07. This analysis also yielded a significant main effect of target age, such that older targets (M = 2.67; SD = 0.40) were rated as feeling less pain than younger targets (M = 2.69; SD = 0.41), $F(1,205)$ = 3.92, p = .049, 95% CI [0.00, 0.05], η_p^2 = 0.02. These main effects were not qualified by a target SES by target age interaction, $F(1,205)$ = 0.32, p = .57, η_p^2 = 0.002; Figure 2—Study 2. That is, SES–pain sensitivity biases were similar in magnitude for 3- to 4-year-old and 6- to 8-year-old children. In addition, the SES effect was over three times as large as the age effect on pain sensitivity, providing further evidence for the pervasive nature of SES–pain sensitivity stereotypes.

Study 3

In Study 3, we tested a mechanism theorized to underlie differential pain sensitivity judgments across child SES. Past work found that participants' perceptions of hardship mediated the effect of target SES on pain sensitivity among adults (Summers et al., 2021). However, it is unclear whether perceptions of hardship would mediate SES–pain sensitivity effects among children, given conflicting evidence within literatures on stereotype application and developmental models of environmental stress effects on children.

Method

Participants. We relied on a small effect size (d = 0.20) to estimate sample size using G*Power (V3.1; Faul et al., 2007). This analysis suggested we needed 200 participants to obtain 80% power for a repeated measures ANOVA. In actuality, we recruited 201 undergraduate students from

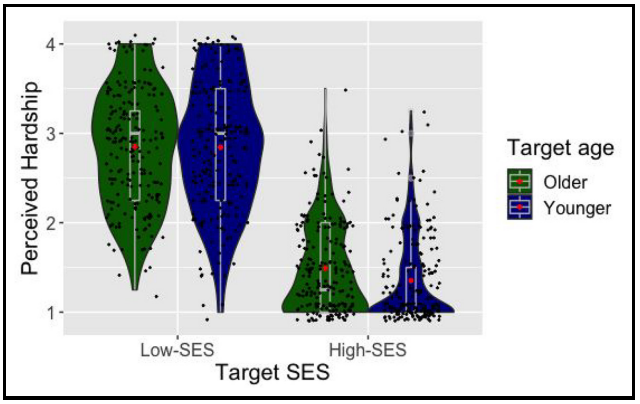

Figure 3. Violin Plot Depicting the Distribution of Hardship Judgments Across Target SES and Target Age (Higher Values = Greater Perceived Hardship).

Note. Red dots indicate the mean of hardship judgments, whereas the black dots indicate jittered individual-level data points. SES = socioeconomic status (See the online article for the color version of this figure).

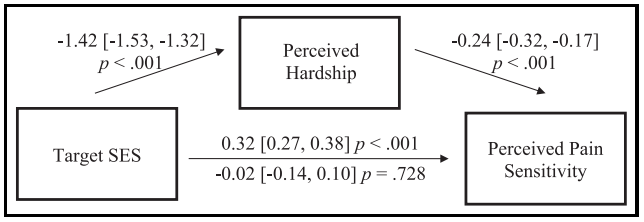

Figure 4. Mediation Model Depicting the Effect of Target SES (High SES – Low SES) on Pain Sensitivity (Higher Numbers = Greater Sensitivity to Pain) as Mediated by Perceived Life Hardship (Higher Numbers = Greater Perceived Life Hardship).

Note. Path estimates represent unstandardized regression estimates alongside their 95% confidence intervals. SES = socioeconomic status.

February 2021 through April 2021. Participants identified primarily as female (127) and white (152; see Table 1) and ranged in age from 18 to 30 years (M_{age} = 19.60; SD_{age} = 1.60). No participants were excluded from analyses.

Procedure. Participants viewed the eight school profiles from Study 2. Participants first rated the child's life hardship on a two-item hardship questionnaire (i.e., "How hard do you think his life has been?" "How much adversity do you think he has overcome?"; adapted from Trawalter et al., 2012). Participants responded to each question using a 4-point Likert-type scale (1 = *not at all* to 4 = *extremely*). The items were averaged to create a composite life hardship score (M = 2.13; SD = 0.42; Spearman–Brown coefficient = .86). Immediately after rating hardship, participants rated the child's pain sensitivity (Trawalter et al., 2012; M = 2.46; SD = 0.34; α = .90).

Participants then completed self-hardship (M = 2.35; SD = 0.69, α = .73) and self-pain sensitivity (M = 2.04; SD = 0.41, α = .86) measures, followed by a demographics questionnaire identifying objective and subjective SES, age, race, sex, primary language, and nationality.

Results and Discussion

A 2 (SES: low vs. high) × 2 (age: preschool vs. first grade) repeated measures ANOVA yielded a significant main effect of target SES on life hardship, indicating that targets with low SES (M = 2.85; SD = 0.65) were rated as having lived a harder life than targets with high SES (M = 1.42; SD = 0.46), $F(1,200)$ = 740.14, p < .001, 95% CI [1.32, 1.53], η_p^2 = 0.79. This analysis also yielded a significant main effect of target age, such that older targets (M = 2.17; SD = 0.44) were rated as having lived a harder life than younger targets (M = 2.10; SD = 0.45), $F(1,200)$ = 13.21, p < .001, 95% CI [0.03, 0.11], η_p^2 = 0.06. These main effects were qualified by a significant target SES by target age interaction, $F(1,200)$ = 11.40, p = .001, η_p^2 = 0.05; Figure 3. Pairwise comparisons revealed that, among targets with low SES, perceptions of hardship did not differ by target age, p = .774. However, among targets with high SES, older targets were rated as having a harder life than younger targets, p < .001. This pattern may suggest that participants believed any experience with poverty (regardless of time) toughens an individual; however, future research should explore this possibility directly.

Next, a 2 (SES: low vs. high) × 2 (age: preschool vs. first grade) repeated measures ANOVA yielded a significant main effect of target SES on pain sensitivity, indicating that targets with low SES (M = 2.30; SD = 0.39) were rated as feeling less pain than targets with high SES (M = 2.62; SD = 0.41), $F(1,200)$ = 124.73, p < .001, 95% CI [0.27, 0.38], η_p^2 = 0.38. This analysis also yielded a significant main effect of target age, such that older targets (M = 2.42; SD = 0.34) were rated as feeling less pain than younger targets (M = 2.49; SD = 0.37), $F(1,200)$ = 28.87, p < .001, 95% CI [0.05, 0.10], η_p^2 = 0.13. These main effects were not qualified by a significant target SES by target age interaction, $F(1,200)$ = 1.14, p = .287, η_p^2 = 0.006; Figure 2—Study 3.

Finally, to test whether perceived hardship mediated the effect of target SES on pain sensitivity, we conducted a within-participants mediation analysis with 10,000 bootstrapped resamples (*MEMORE* macro; Montoya & Hayes, 2017). Importantly, the indirect effect was significant, ab = 0.34, 95% CI [0.24, 0.45]; Figure 4. This suggests that perceived hardship mediated the effect of SES on pain sensitivity. That is, participants perceived children with low SES as having a harder life and therefore as less sensitive to pain than children with high SES. The current version of MEMORE is not capable of conducting moderated mediation for target-level moderator variables; however, we replicate the findings presented below when considering older and younger targets separately (see Supplemental Materials).

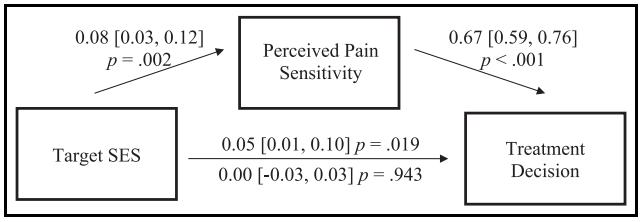

Figure 5. Mediation Model Depicting the Effect of Target SES (High SES – Low SES) on Pain Treatment (Higher Numbers = More Intensive Drug Treatment) as Mediated by Perceived Pain Sensitivity (Higher Numbers = Greater Sensitivity to Pain).

Note. Path estimates represent unstandardized regression estimates alongside their 95% confidence intervals. SES = socioeconomic status.

Study 4

In Study 4, we investigated downstream consequences of SES-based biases in pain perceptions. Specifically, we tested whether SES-based biases in perceptions of children's pain sensitivity may manifest in disparate hypothetical pain treatment recommendations. It is possible that children are seen as experiencing pain differently but are treated similarly across SES. Some past research suggested that gender, race, and attractiveness did not influence nurses' pain treatment recommendations for children (Griffin et al., 2007). To our knowledge, there is no work examining whether perceiver biases influence treatment recommendations for children of varying SES.

Method

Participants. To estimate sample size, we again relied on a small effect ($d = 0.20$) suggesting we needed 200 participants to obtain 80% power for repeated measures ANOVA. In actuality, 196 American participants were recruited via CloudResearch (Litman et al., 2016) in May 2020. Participants identified primarily as male (125) and white (142; see Table 1) and ranged in age from 21 to 72 years ($M_{age} = 37.26$; $SD_{age} = 11.96$). No participants were excluded from analyses.

Procedure. Participants viewed the school profiles from Studies 2 and 3 and rated the child's pain sensitivity (Trawalter et al., 2012; $M = 2.69$; $SD = 0.45$; $\alpha = .96$) followed by how much pain treatment they believed the child would require in response to seven injuries on a 4-point scale (1 = *no drug treatment* to 4 = *strong opioid drug treatment [e.g., Morphine]*; World Health Organization, 2017). Four of the injuries were adapted from Trawalter and colleagues (2012; see Supplemental Materials) while the remaining three were deemed unique to adults (i.e., wisdom teeth removal, shingles, hurt while assembling furniture) and replaced with injuries common among children (i.e., scraped knee, concussion, sprained ankle; Brennan, 2018). Responses to the seven injuries were averaged into a composite treatment score ($M = 2.57$; $SD = 0.57$; $\alpha = .91$).

Next, participants self-reported their own pain sensitivity ($M = 2.50$; $SD = 0.57$; $\alpha = .84$) and anticipated treatment required ($M = 2.44$; $SD = 0.67$; $\alpha = .93$). Finally, participants completed a demographics questionnaire identifying objective and subjective SES, age, race, sex, primary language, and nationality.

Results and Discussion

A 2 (SES: low vs. high) × 2 (age: preschool vs. first grade) repeated measures ANOVA yielded a significant main effect of target SES on pain sensitivity, indicating that targets with low SES ($M = 2.65$; $SD = 0.49$) were rated as feeling less pain than targets with high SES ($M = 2.73$; $SD = 0.47$), $F(1,195) = 9.48$, $p = .002$, 95% CI [0.03, 0.12], $\eta_p^2 = 0.05$. This analysis also yielded a significant main effect of target age, such that older targets ($M = 2.67$; $SD = 0.46$) were rated as feeling less pain than younger targets ($M = 2.71$; $SD = 0.45$), $F(1,195) = 6.69$, $p = .010$, 95% CI [0.01, 0.06], $\eta_p^2 = 0.03$. These main effects were not qualified by a target SES by target age interaction, $F(1,195) = 0.51$, $p = .476$, $\eta_p^2 = 0.003$; Figure 2—Study 4.

Next, a 2 (SES: low vs. high) × 2 (age: preschool vs. first grade) repeated measures ANOVA yielded a significant main effect of target SES on pain treatment, indicating that targets with low SES ($M = 2.55$; $SD = 0.60$) were rated as requiring less intensive pain treatment than targets with high SES ($M = 2.60$; $SD = 0.58$), $F(1,195) = 5.64$, $p = .019$, 95% CI [0.01, 0.10], $\eta_p^2 = 0.03$. This analysis also yielded a significant main effect of target age, such that older targets ($M = 2.56$; $SD = 0.58$) were rated as requiring less intensive pain treatment than younger targets ($M = 2.59$; $SD = 0.58$), $F(1,195) = 5.98$, $p = .015$, 95% CI [0.01, 0.06], $\eta_p^2 = 0.03$. These main effects were not qualified by a target SES by target age interaction, $F(1,195) = 0.03$, $p = .864$, $\eta_p^2 < 0.001$.

Finally, to test whether perceived pain sensitivity mediated the effect of target SES on hypothetical pain treatment, we conducted a within-participants mediation analysis with 10,000 bootstrapped resamples (*MEMORE* macro; Montoya & Hayes, 2017). Importantly, the indirect effect of the mediation was significant, $ab = 0.05$, 95% CI [0.02, 0.09]; Figure 5. Consistent with our hypothesis, perceived pain sensitivity mediated the effect of target SES on pain treatment judgments. That is, participants perceived children with low SES as less sensitive and therefore as requiring less intensive pain treatment than children with high SES. We replicate the findings presented above when considering older and younger targets separately (see Supplemental Materials).

General Discussion

We examined whether stereotypes of individuals with lower SES as inured to pain pervade judgments of children. To this end, we presented four experiments finding converging evidence that children with low SES (relative to high SES) were judged as insensitive to pain. We found that this SES-to-pain sensitivity effect was mediated by perceptions of life hardship. Further, this SES-to-pain sensitivity effect had consequences for hypothetical pain treatment recommendations. Specifically, children with low SES were evaluated as less sensitive to pain and therefore as requiring less intensive pain treatment than children with high SES.

Implications

This work offers theoretical advances to our understanding of potential boundaries (or lack thereof) of stereotype application. The current work provides initial evidence that SES-based stereotypes that are applied to adults may also be applied to children. Although some previous research has found that other group-based stereotypes were applied to children (e.g., gender–pain and race–threat stereotypes; Cohen et al., 2014; Todd et al., 2016), it is interesting that participants applied SES-based stereotypes to children given evidence that Americans may overestimate upward economic mobility (Davidai & Gilovich, 2018; Kraus & Tan, 2015). In other words, if SES boundaries are seen as more permeable and less stable than other group boundaries like race, sex, or gender, then perceivers should be less willing to apply SES-based stereotypes to children. Furthermore, judgments in these experiments were untimed, which dual process theories argue should allow for more effortful rather than heuristic-based processing (see Chaiken & Trope, 1999 for review), and were captured in a within-subjects design, which researchers have argued affords an opportunity to overcome intuitions (see Kahneman & Frederick, 2005).

Despite conservative design elements that are theorized to attenuate expression of bias, enable logical thinking, or yield differentiation between judgments of children and adults, we found that perceivers stereotyped low-SES children as insensitive to pain. The current work's finding that perceptions of life hardship mediated the application of SES–pain stereotypes may aid in understanding why perceptions of children did not deviate from adults. First, beliefs about lived hardship seem notably less negative than other SES-based stereotypes pertaining to negative trait inferences (e.g., lazy, dirty, unmotivated; Cozzarelli et al., 2001). For example, despite the pernicious effects for downstream pain judgments, hardship stereotypes may foster greater sympathy than negative trait stereotypes. Thus, perceivers may be more willing to apply these ostensibly less negative beliefs to children. Second, in Study 3, the effect of target age on hardship judgments was only significant among high-SES but not among low-SES targets. This finding may suggest that perceivers' judgments of hardship rely on the individual experience with poverty rather than the length of time in poverty. Thus, beliefs about the permeability of SES or the length of children's life experiences may not matter for judgments of pain sensitivity that appear to be driven by perceptions of current life hardship. Still, neither beliefs about the perceived benevolence of hardship stereotypes nor beliefs about the permeability of SES were measured and may be good fodder for future research.

This work also has important practical applications. Given that children may not be old enough to express their pain fully or accurately (Earp et al., 2019) and pain cannot be objectively measured, it is important to understand whether SES–pain stereotypes have consequences for recommended care. In Study 4, we found that participants recommended less intensive pain treatment to children with low SES than with high SES and this was mediated through perceptions of pain sensitivity. Although the effect of target SES on pain treatment was significant, it was a small-to-medium effect ($\eta_p^2 = 0.03$). In terms of possible "real-world" implications, a calculation of the common language effect size (McGraw & Wong, 1992) indicated that, after controlling for individual differences, the likelihood that a perceiver would ascribe less intensive pain treatment for a child with low SES than with high SES is 57%. Thus, clinicians may not always recommend less intensive pain treatment to children with low SES relative to high SES; however, this pattern is more likely to occur than not.

Interestingly, target age did not moderate SES–pain effects. Although this does not rule out a potential target SES by age interaction on pain judgments, it suggests that such an interaction may be small or exist only among larger age differences. Future work would do well to investigate target SES by age interactions on pain judgments across the lifespan. To this point, we did notice descriptive differences in effect sizes across the current, child-focused (average sensitivity $d = 0.69$; treatment $d = 0.35$), and previous, adult-focused (lay perceiver average sensitivity $d = 0.83$; treatment $d = 0.52$; Summers et al., 2021), investigations. This could indicate that SES–pain biases may be less robust toward children than adults, although, given the cross-study comparison, strong claims should be avoided.

Limitations

Several limitations of the current work warrant discussion. First, all targets were white males, which limits conclusions about how these results would generalize to non-white and/or non-male children. To this point, researchers have found among adult targets that both apparent race (Trawalter et al., 2012) and SES (Summers et al., 2021) afforded assumptions about life hardship and therefore pain sensitivity. This previous work has not found significant

interactions between target SES and target race (Summers et al., 2021; Trawalter et al., 2012). However, Trawalter and colleagues' (2012; Study 6) findings suggest that status subsumed race effects in pain sensitivity judgments, whereas Summers and colleagues' (2021; Study 2) findings suggest an additive effect of target race and SES on pain sensitivity judgments. Still, it is an open question whether any one identity (e.g., race, SES, sex) is more influential in ratings of children and whether multiple identity cues provide unique or overlapping streams of information in perceptions of children. Thus, it is imperative to examine these child SES-to-pain effects with a more diverse set of targets, particularly at the intersection of multiple minoritized identities (Petsko & Bodenhausen, 2020).

Second, our samples were limited in racial diversity (majority white) and thus generalizability across perceiver race. Still, our SES-to-pain effects (see Supplemental Materials) and past race-to-pain (Trawalter et al., 2012) and SES-to-pain (Summers et al., 2021) effects appear to be cultural stereotypes rather than intergroup phenomena (i.e., pain stereotypes are held by both in-group and out-group perceivers) and therefore may generalize across many perceiver demographics. However, medical expertise could be one particularly important demographic moderator pertaining to Study 4's treatment results. Only medical providers can prescribe weak and strong opioids (comprising two of four response options). It is possible that our treatment results are a conservative estimate of the effect among medical providers given past work suggesting that parents may undertreat their children relative to medical providers' recommendations (Finley et al., 1996; Hoffman & Tarzian, 2007). However, it is also possible that our treatment results do not generalize to medical providers who have the legal discretion to prescribe pain medication. Although an open question, past work found that race- and SES-based biases that impact pain perception and treatment were held by lay perceivers and medical providers alike (Lloyd et al., 2021; Summers et al., 2021; Trawalter et al., 2012). Future work should examine whether medical providers, especially pediatricians, hold similar SES-to-pain beliefs and whether these beliefs aid in explaining documented discrepancies in low-SES children's health outcomes (Chen et al., 2006; King et al., 2011; Starfield et al., 2002). Still, even if pediatricians do not exhibit this bias, parents, teachers, and care takers may be less attuned to or worried about relatively low-SES (compared with high-SES) children's pain and thus may not seek care for the child.

Conclusion

In sum, we provide evidence that children with low SES (relative to high SES) are perceived as less sensitive to pain, and this effect extends to children as young as 3 to 4 years old. Importantly, this work has theoretical implications for understanding SES-based stereotype application to children and practical implications for the undertreatment of lower SES children's pain.

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Supplemental Material

The supplemental material is available in the online version of the article.

Notes

1. Effect size d_z was calculated using the formula: $d_z = t/\sqrt{N}$.
2. Correlations between high-SES and low-SES pain sensitivity trials were high across studies; Study 1: $r(131) = .59$, $p < .001$, Study 2: $r(206) = .64$, $p < .001$, Study 3: $r(201) = .47$, $p < .001$, and Study 4: $r(196) = .74$, $p < .001$.

References

Adler, N. E., Boyce, T., Chesney, M. A., Cohen, S., Folkman, S., Kahn, R. L., & Syme, S. L. (1994). Socioeconomic status and health: The challenge of the gradient. *American Psychologist*, *49*, 15–24.

Baker, E. H. (2014). Socioeconomic status, definition. In W. C. Cockerham, R. Dingwall & S. Quah (Eds.), *The Wiley Blackwell encyclopedia of health, illness, behavior, and society* (pp 2210–2214) https://doi.org/10.1002/9781118410868.wbehibs395.

Brekke, M., Hjortdahl, P., & Kvien, T. K. (2002). Severity of musculoskeletal pain: Relations to socioeconomic inequality. *Social Science & Medicine*, *54*(2), 221–228.

Brennan, D. (2018). Bumps to breaks: Common injuries in kids. https://www.webmd.com/children/ss/slideshow-kids-injuries

Bristow, R. E., Powell, M. A., Al-Hammadi, N., Chen, L., Miller, J. P., Roland, P. Y., & . . . Cliby, W. A. (2013). Disparities in ovarian cancer care quality and survival according to race and socioeconomic status. *JNCI: Journal of the National Cancer Institute*, *105*(11), 823–832.

Chaiken, S., & Trope, Y. (Eds.). (1999). *Dual-process theories in social psychology*. Guilford Press.

Chen, E., Martin, A. D., & Matthews, K. A. (2006). Socioeconomic status and health: Do gradients differ within childhood and adolescence? *Social Science & Medicine*, *62*(9), 2161–2170.

Chen, E., Matthews, K. A., & Boyce, W. T. (2002). Socioeconomic differences in children's health: How and why do these relationships change with age? *Psychological Bulletin*, *128*(2), 295–329.

Chzhen, Y., Howarth, C., & Main, G. (2022). Deprivation and intra-family conflict: Children as agents in the Family Stress Model. *Journal of Marriage and Family*, *84*(1), 121–140.

Cohen, L. L., Cobb, J., & Martin, S. R. (2014). Gender biases in adult ratings of pediatric pain. *Children's Health Care*, *43*(2), 87–95.

Cohen, L. L., Lemanek, K., Blount, R. L., Dahlquist, L. M., Lim, C. S., Palermo, T. M., & . ..Weiss, K. E. (2008). Evidence-based assessment of pediatric pain. *Journal of Pediatric Psychology*, *33*(9), 939–955.

Cozzarelli, C., Wilkinson, A. V., & Tagler, M. J. (2001). Attitudes toward the poor and attributions for poverty. *Journal of Social Issues*, *57*(2), 207–227.

Cuddy, A. J., Fiske, S. T., & Glick, P. (2008). Warmth and competence as universal dimensions of social perception: The stereotype content model and the BIAS map. *Advances in Experimental Social Psychology*, *40*, 61–149.

Davidai, S., & Gilovich, T. (2015). Building a more mobile America—One income quintile at a time. *Perspectives on Psychological Science*, *10*(1), 60–71.

Davidai, S., & Gilovich, T. (2018). How should we think about Americans' beliefs about economic mobility? *Judgment & Decision Making*, *13*(3), 297–304.

Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology*, *56*(1), 5–18.

Earp, B. D., Monrad, J. T., LaFrance, M., Bargh, J. A., Cohen, L. L., & Richeson, J. A. (2019). Featured article: Gender bias in pediatric pain assessment. *Journal of Pediatric Psychology*, *44*(4), 403–414.

Evans, D. A., Hebert, L. E., Beckett, L. A., Scherr, P. A., Albert, M. S., Chown, M. J., & . . . Taylor, J. O. (1997). Education and other measures of socioeconomic status and risk of incident Alzheimer disease in a defined population of older persons. *Archives of Neurology*, *54*, 1399–1405.

Fabes, R. A., & Martin, C. L. (1991). Gender and age stereotypes of emotionality. *Personality and Social Psychology Bulletin*, *17*(5), 532–540.

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*, 175–191.

Finley, G. A., McGrath, P. J., Forward, S. P., McNeill, G., & Fitzgerald, P. (1996). Parents' management of children's pain following "minor" surgery. *Pain*, *64*(1), 83–87.

Fiske, S. T., Cuddy, A. J. C., Glick, P., & Xu, J. (2002). A model of stereotype content as often mixed: Separate dimensions of competence and warmth respectively follow from status and competition. *Journal of Personality and Social Psychology*, *82*(6), 878–902.

Gebauer, S., Salas, J., & Scherrer, J. F. (2017). Neighborhood socioeconomic status and receipt of opioid medication for new back pain diagnosis. *The Journal of the American Board of Family Medicine*, *30*(6), 775–783.

Gilbert, D. T., & Hixon, J. G. (1991). The trouble of thinking: Activation and application of stereotypic beliefs. *Journal of Personality and Social Psychology*, *60*(4), 509–517.

Goff, P. A., Jackson, M. C., Di Leone, B. A., Culotta, C. M., & DiTomasso, N. A. (2014). The essence of innocence: Consequences of dehumanizing Black children. *Journal of Personality and Social Psychology*, *106*(4), 526–545.

Griffin, R. A., Polit, D. F., & Byrne, M. W. (2007). Stereotyping and nurses' recommendations for treating pain in hospitalized children. *Research in Nursing & Health*, *30*(6), 655–666.

Haas, J. S., Cleary, P. D., Guadagnoli, E., Fanta, C., & Epstein, A. M. (1994). The impact of socioeconomic status on the intensity of ambulatory treatment and health outcomes after hospital discharge for adults with asthma. *Journal of General Internal Medicine*, *9*(3), 121–126.

Hoffman, D. E., & Tarzian, A. J. (2007). The role and legal status of health care ethics committees in the United States. In A. S. Iltis, S. H. Johnson, & B. A. Hinze (Eds.), *Legal Perspectives in Bioethics*, 56–77. Routlege Taylor and Francis.

Hoffman, K. M., & Trawalter, S. (2016). Assumptions about life hardship and pain perception. *Group Processes & Intergroup Relations*, *19*, 493–508.

Jacobs, J. E., & Eccles, J. S. (1992). The impact of mothers' gender-role stereotypic beliefs on mothers' and children's ability perceptions. *Journal of Personality and Social Psychology*, *63*(6), 932–944.

Joynt, M., Train, M. K., Robbins, B. W., Halterman, J. S., Caiola, E., & Fortuna, R. J. (2013). The impact of neighborhood socioeconomic status and race on the prescribing of opioids in emergency departments throughout the United States. *Journal of General Internal Medicine*, *28*, 1604–1610.

Kahneman, D. (2003). A perspective on judgment and choice: mapping bounded rationality. *American Psychologist*, *58*(9), 697–720.

Kahneman, D., & Frederick, S. (2005). A model of heuristic judgment. In K. J. Holyoak, & R. G. Morrison (Eds.), *The Cambridge handbook of thinking and reasoning* (pp. 267–294). Cambridge University Press.

King, S., Chambers, C. T., Huguet, A., MacNevin, R. C., McGrath, P. J., Parker, L., & MacDonald, A. J. (2011). The epidemiology of chronic pain in children and adolescents revisited: A systematic review. *Pain*, *152*(12), 2729–2738.

Kochhar, R., & Cilluffo, A. (2018). *Income inequality in the U.S. is rising most rapidly among Asians*. https://www.pewsocialtrends.org/2018/07/12/appendix-b-additional-tables-4/

Kraus, M. W., & Tan, J. J. (2015). Americans overestimate social class mobility. *Journal of Experimental Social Psychology*, *58*, 101–111.

Le, H., Ziogas, A., Lipkin, S. M., & Zell, J. A. (2008). Effects of socioeconomic status and treatment disparities in colorectal cancer survival. *Cancer Epidemiology and Prevention Biomarkers*, *17*(8), 1950–1962.

Litman, L., Robinson, J., & Abberbock, T. (2016). TurkPrime.com: A versatile crowdsourcing data acquisition platform for the behavioral sciences. *Behavior Research Methods*, *49*(2), 433–442.

Lloyd, E. P., Lloyd, A. R., McConnell, A. R., & Hugenberg, K. (2021). *Race deficits in pain detection: Medical providers and laypersons fail to accurately perceive pain authenticity among Black people* (Invited Rev.). Social Psychological and Personality Science.

Lloyd, E. P., Paganini, G. A., & ten Brinke, L. (2020). Gender stereotypes explain disparities in pain care and inform

equitable policies. *Policy Insights from the Behavioral and Brain Sciences*, *7*(2), 198–204.

LoBue, V. (2014). *The Child Affective Facial Expression (CAFE) set*. Databrary. http://doi.org/10.17910/B7301K

LoBue, V., & Thrasher, C. (2015). The Child Affective Facial Expression (CAFE) set: Validity and reliability from untrained adults. *Frontiers in Psychology*, *5*, Article 1532.

Luo, Y., & Waite, L. J. (2005). The impact of childhood and adult SES on physical, mental, and cognitive well-being in later life. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *60*(2), S93–S101.

Masarik, A. S., & Conger, R. D. (2017). Stress and child development: A review of the Family Stress Model. *Current Opinion in Psychology*, *13*, 85–90.

Mazzella, R., & Feingold, A. (1994). The effects of physical attractiveness, race, socioeconomic status, and gender of defendants and victims on judgments of mock jurors: A meta-analysis 1. *Journal of Applied Social Psychology*, *24*(15), 1315–1338.

McGraw, K. O., & Wong, S. P. (1992). A common language effect size statistic. *Psychological Bulletin*, *111*(2), 361–365.

Molina, E., Del Rincon, I., Restrepo, J. F., Battafarano, D. F., & Escalante, A. (2015). Association of socioeconomic status with treatment delays, disease activity, joint damage, and disability in rheumatoid arthritis. *Arthritis Care & Research*, *67*(7), 940–946.

Montepare, J. M., & Zebrowitz, L. A. (1998). Person perception comes of age: The salience and significance of age in social judgments. *Advances in Experimental Social Psychology*, *30*, 93–161.

Montoya, A. K., & Hayes, A. F. (2017). Two-condition within-participant statistical mediation analysis: A path-analytic framework. *Psychological Methods*, *22*, 6–27.

Petsko, C. D., & Bodenhausen, G. V. (2020). Multifarious person perception: How social perceivers manage the complexity of intersectional targets. *Social and Personality Psychology Compass*, *14*(2), Article e12518.

Schechter, N. L., Zempsky, W. T., Cohen, L. L., McGrath, P. J., McMurtry, C. M., & Bright, N. S. (2007). Pain reduction during pediatric immunizations: Evidence-based review and recommendations. *Pediatrics*, *119*(5), e1184–e1198.

Small, D. A., Pope, D. G., & Norton, M. I. (2012). An age penalty in racial preferences. *Social Psychological and Personality Science*, *3*(6), 730–737.

Starfield, B., Robertson, J., & Riley, A. W. (2002). Social class gradients and health in childhood. *Ambulatory Pediatrics*, *2*(4), 238–246.

Summers, K. M., Deska, J. C., Almaraz, S. M., Hugenberg, K., & Lloyd, E. P. (2021). Poverty and pain: Low-SES people are believed to be insensitive to pain. *Journal of Experimental Social Psychology*, *95*, 104116.

Tiggemann, M., & Anesbury, T. (2000). Negative stereotyping of obesity in children: The role of controllability beliefs. *Journal of Applied Social Psychology*, *30*(9), 1977–1993.

Todd, A. R., Thiem, K. C., & Neel, R. (2016). Does seeing faces of young black boys facilitate the identification of threatening stimuli? *Psychological Science*, *27*(3), 384–393.

Trawalter, S., Hoffman, K. M., & Waytz, A. (2012). Racial bias in perceptions of others' pain. *PLOS ONE*, *7*, Article e48546.

Walpole, M. (2003). Socioeconomic status and college: How SES affects college experiences and outcomes. *The Review of Higher Education*, *27*(1), 45–73.

World Health Organization. (2017). *WHO's cancer pain ladder for adults*. http://www.who.int/cancer/palliative/painladder/en/

Zhang, L., Losin, E. A. R., Ashar, Y. K., Koban, L., & Wager, T. D. (2021). Gender biases in estimation of others' pain. *The Journal of Pain*, *22* (9), 1048–1059.

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