

**Parents' Work Injuries and Children's Mental Health: The Moderating Role of Children's  
Work Centrality**

Nick Turner<sup>1</sup>, Steve Granger<sup>1</sup>, Sean Tucker<sup>2</sup>, Connie Deng<sup>1</sup>, and E. Kevin Kelloway<sup>3</sup>

<sup>1</sup>Haskayne School of Business, University of Calgary, Canada

<sup>2</sup>Faculty of Business Administration, University of Regina, Canada

<sup>3</sup>Department of Psychology, Saint Mary's University, Canada

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### **Abstract**

The purpose of this study is to explore the relationship between parents' work-related injuries and their children's mental health, and whether children's work centrality – the extent to which a child believes work will play an important part in their life – exacerbates or buffers this relationship. We argue that high work centrality can exacerbate the relationship between parental work injuries and children's mental health, with parental work injuries acting as identity-threatening stressors; in contrast, high work centrality may buffer this relationship, with parental work injuries acting as identity-confirming stressors. We test this relationship with a sample of Canadian children ( $n = 4,884$ , 46.2% female,  $M$  age = 13.67 years). Children whose parents had experienced more frequent lost-time work-related injuries reported worse mental health with high work centrality buffering this negative relationship. Our study highlights the vicarious effects of work injuries on salient others, specifically parental work injuries on children's mental health, as well as the role of work centrality in shaping children's sense-making and expectations about the consequences of work.

*Keywords:* adolescents, injuries, mental health, parents, work centrality, young workers.

## **1. Introduction**

Occupational injuries negatively affect workers, co-workers, employers, and the families of injured workers. Research on the consequences of a work-related injury on the injured person's family highlights changes in family functioning, with potentially negative consequences for children (Sachs & Ellenberg, 1994; Kosny et al., 2018). Changes in family functioning can have negative consequences for children (Dembe, 2001, 2005; Keogh et al., 2000), including adverse physical health effects (Asfaw et al., 2012; Asfaw et al., 2016) as well as declines in mental health (Hisle-Gorman et al., 2019).

The current study investigates the mental health consequences for children of parents who are injured at work, as well as how children's early beliefs about the importance of work affects this relationship. We predict that observing parents who are off work due to a work-related injury is associated with lower quality mental health. Parents who have paid employment outside the home are often the first point of contact about the world of work for many children, with children learning much from indirectly experiencing the positive and negative consequences of their parents' work (Mortimer, 2003; Preves & Mortimer, 2013). We argue in this paper that the interaction between formative experiences related to work, namely frequency of parents' work-related injuries, and a child's own work centrality predicts additional variance in that child's mental health. What is unclear is whether the parental work injury-child work centrality relationship has adverse or protective effects on a child's mental health. In the current study, we use data from a large sample of Canadian school children to explore the main and interactive effects of parental work injuries and work centrality on children's mental health.

## **2. Literature review**

### ***2.1. Work injuries and mental health***

Research shows that employees who experience a work-related physical injury, and require time away from work to heal, are at greater risk of experiencing a mental illness (e.g., Jones et al., 2018; Orchard et al., 2020). However, little is known about the potential spillover of parental work-related time-loss injuries on children's psychological wellbeing. Sachs and Ellenberg (1994) describe a range of family outcomes of a work-injured parent including role changes (e.g., the injured parent may not be able to carry out childcare), communication changes (e.g., the nature of the parent's interaction with children changes), changes in intimacy (e.g., increased emotional distance with children and lack of family cohesiveness as a result of parental injury), and changes with boundaries (e.g., children taking on more household responsibilities during recuperation and assisting the parent with rehabilitation). More recently, Hisle-Gorman et al. (2019) found that children of parents in the military who sustained an injury required more mental health care and increased psychiatric medication use after their parents' injuries. Analogously, we hypothesized that children of parents who experienced lost-time (severe) work injuries would report poorer quality mental health than those children whose parents had not experienced lost-time work injuries.

## ***2.2. Children's vicarious experiences of work and development of work centrality***

Childhood and early adolescence comprise the life stages when self-concepts and values about work develop, shaping expectations about what work means and its importance (Cemalcilar et al., 2019; Kittel et al., 2019). The experience of working part-time or odd jobs while going to school (e.g., babysitting, helping in a family business, lawn mowing, casual service work) is one important way this occurs. Data from a nationally-representative sample of Canadian children in 2002 suggest over half of Grade 5 children (9-10 year olds) held at least one odd job for pay at the time of the survey, with the proportion of part-time job holders rising

to almost 90% among those in Grade 9 (13-14 year olds; Bergenwell et al., 2014). Furthermore, Mortimer's (2003) cohort study found that teenagers who were "most invested" (i.e., greater number of total months working and total cumulative hours) in work while going to school developed stronger extrinsic work values (e.g., the importance of earning money or job security) than those who did not work while going to school. More work experience and stronger work values contribute to a more clearly defined work identity, with variation in the extent to which work becomes more or less central to children's self-concepts.

The centrality of work to self-concept, or work centrality, is defined as the extent to which work plays and will play a principal role in the lives of individuals (Paullay et al., 1994). Further, work centrality is relatively consistent and stable in adults once it develops rather than differing from job-to-job (e.g., Harpaz & Fu, 2002). Prior to working part-time, however, development of work centrality in children comes from learning about the work experiences of salient others such as parents (Kittel et al., 2019). Substantial evidence points to how parents' work experience indirectly shapes their children's attitudes and outcomes. For instance, parental job insecurity is related to children's work and life beliefs (e.g., lower humanistic work beliefs and higher beliefs in an unjust world; Barling et al., 1998; Barling & Mendelson, 1999), as well as higher cognitive distraction (Barling et al., 1999) and lower academic performance (Barling & Mendelson, 1999). Furthermore, Lim and Kim (2014) show that parental frustration stemming from work is related to lower work centrality of children via non-supportive parenting behavior. These vicarious experiences of work via parents involves children being directly affected by aspects of their parents' work; in the current study, we investigate the consequences of parents' work injuries on children's mental health. More specifically, we argue that the psychological

strain of parents' work injuries experienced by children may be contingent on the extent to which children see work as central to their self-concepts.

### ***2.3. Stress appraisal, work centrality, and mental health***

A key feature of many models of psychological stress (e.g., Lazarus & Folkman, 1984) is the subjective appraisal of stressors, such that the same stressor can be perceived by different people as ranging from innocuous to harmful or threatening. A vital factor in the subjective appraisal of stress is "an important or valued self-conception" (Thoits, 2013, p. 361). The subjective appraisal of stress between individuals based on the conditional role of an important self-concept gives rise to competing hypotheses.

In the current context, we argue that the extent to which a child sees work as important to their self-concept can increase the likelihood that a parental work injury is perceived to be harmful or threatening. The more a child identifies with work, the higher the potential a parental work injury as an adverse work event can engender psychological harm because it threatens a domain important to a child's self-concept. In the same way albeit with an adult working sample, Martire et al. (2000) showed that high work centrality exacerbated the association between employee stress and depressive symptoms: the relationship between employee stress and depressive symptoms was strengthened as they perceived work-related stress as identity-threatening. Parental work injuries may therefore be an identity-threatening stressor, with higher work centrality exacerbating the relationship between parental work injury and a child's mental health.

An alternative hypothesis is that a parental work injury could be considered identity-confirming by children. Through this lens, high work centrality acts as a personal resource for making sense of and coping with a parental work injury. Work centrality may play a role in

offsetting the psychological strain associated with a parent's work injury by anchoring a child's expectations. Children with high work centrality may be more likely to see a parent's work-caused injury as identity-confirming, enabling appraisal of the parental work injury with fewer negative emotions and associating work injuries with the belief that "this is just the way work is." Parental work injuries may therefore be an identity-confirming stressor, with higher work centrality buffering the relationship between parental work injury and a child's mental health.

In the present study, we examined whether the relationship between parental work injuries and children's mental health varied by level of children's work centrality—whether it served to intensify or cushion the adverse relationship between parental injuries and children's mental health (see Figure 1).

### **3. Method and measures**

#### ***3.1 Participants and procedure***

Between September 2013 and July 2014, 5,330 participants (54% male) primarily from the Canadian province of Ontario voluntarily responded to a short survey before taking Passport to Safety Challenge for Teens (Parachute Canada, 2019), an online occupational safety module voluntarily selected by hundreds of teachers and school boards across Canada (mainly the province of Ontario) for use in in junior high school and high school classes to raise students' awareness about young workers' rights and responsibilities and workplace hazards. The curriculum for the Challenge for Teens module variously covers employer responsibilities, worker rights and responsibilities, work hazard information systems, dealing with work hazards, and other general workplace safety provisions. We removed 446 participants from the sample who reported being under the age of ten years old or whose age was missing. Among the remaining participants ( $N = 4,884$ ), 46.2% were female, the average age was 13.67 years old ( $SD$

= 1.21, range: 10-18 years), and approximately 36% of the sample were employed part-time at the time of the survey.

The short survey appeared before participants logged into the Challenge for Teens curriculum. It was designed to be completed in under a minute and was restricted to only a few items. Each school year we included different items in the short survey. Data from other items collected from different school years' surveys have been reported in other articles (e.g., 2011-2012 in Tucker et al., 2014 and Turner et al., 2015; 2012-2013 in Pek et al., 2017; 2012-2013 and 2014-2015 in Tucker et al., 2015); readers can get more information about Passport to Safety resources from these sources.

### **3.2 Measures**

**Parental work injuries.** We measured parental experience of workplace injuries by asking all respondents how frequently their mother and father (each in a separate item) had experienced lost-time work injuries (i.e., "How many times has your mother [father] been forced to take time off work due to a work-related injury?"). The two items about parents used a response scale 'never' (0), 'once' (1), 'twice' (2), 'three times' (3), and 'four or more times' (4), with an addition of a 'does not apply/unsure' option. We used two items as manifest indicators of a latent variable to reflect the vicarious experience of parental workplace injuries.

**Mental health.** We used two items from the General Health Questionnaire (Shevlin & Adamson, 2005) social dysfunction sub-scale as an indicator of mental health. The items had the root "How much of the time, during the last month, have you..." at the front of each item: "enjoyed day-to-day activities" and "been able to concentrate". The response scale was a five-point scale, ranging (coded as) from never (1) to always (5), with higher scores indicating better mental health. We used these two items as indicators of a mental health latent variable.



**Work centrality.** We adapted four items from Paullay et al. (1994) measure of work centrality by including the root “I expect...” at the front of each item: “work will be very central to my existence,” “that the major satisfaction in my life will come from work,” “the most important things that will happen to me will involve my work,” and “I would probably keep working even if I didn’t need the money”. Although this work centrality scale has evidenced subsequent validity and reliability (e.g., Hirschfeld & Feild, 2000), these properties are based on working adult samples, not adolescent samples. The four items used here had high face validity and as a set had a Flesch-Kincaid Grade Level score (i.e., a function of average word length of each item and average number of syllables per word) of 5.8, several school grades below the reading level of the average respondent (i.e., Grade 8/9). The response scale was a five-point scale, ranging (coded as) from strongly disagree (1) to strongly agree (5), with higher scores representing work being a more central part of the respondent’s self-concept. We used the four items as indicators of a work centrality latent variable.

**Demographic variables.** Respondents reported their gender (female = 0; male = 1), their age (in years), and whether or not they were employed at the time of the survey.

## **4. Results**

### ***4.1 Data analysis strategy***

We used the two-step latent moderated structural equation method (LMS; Klein & Moosbrugger, 2000; Maslowsky et al., 2015) with XWITH and full information maximum likelihood with robust standard errors in Mplus (Muthén & Muthén, 1998-2012) to test the relationship among parental work injuries, work centrality, and their interaction on children’s mental health. This involved first testing a model without the latent interaction as a comparison model and as a means of examining the main effects. In a second model (i.e., the hypothesized

model), we created a cross-product term between the latent variables of parental work injuries and work centrality. The latent interaction variable would be deemed significant based on a likelihood ratio test when comparing the models. Estimation of the measurement model prior to the structural equation modeling suggested good fit ( $\chi^2 = 162.41, p < .001$ , comparative fit index = .97, Tucker-Lewis index = .95, root mean square error of approximation = .03 [95% CI: .03, .04]; Browne & Cudeck, 1993).

#### ***4.2. Parental work injuries, work centrality, and children's mental health***

Table 1 reports employment status of the sample by age, Table 2 reports descriptive statistics and zero-order correlations for the sample, and Table 3 reports results from the structural equation model we described above. Approximately half of the respondents at the modal age of 13 years reported being employed at the time of the survey, with percentages of part-time employment for participants aged between 10 and 12 years ranging from 38% to 44% (see Table 1). We found that the parental experience of injury was negatively related to children's mental health ( $r = -.09, p < .001$ ; see Table 2). This finding is replicated in our multivariate model: parental experience of injury was negatively related to children's mental health ( $b = -.19, SE = .03, p < .001, 95\% \text{ CI: } -.26, -.13$ ), controlling for age and gender (see Table 3). Further, there was a significant interaction between parental injuries and work centrality ( $b = .12, SE = .02, p < .001, 95\% \text{ CI: } .06, .18$ ), with the comparison model representing a significant loss in fit relative to the interaction model ( $\chi^2 = 5.38, p = .020$ )<sup>1</sup>. Plotting the interaction (see Figure 2) revealed that parental work injuries were related to worse mental health among children who reported low work centrality. Assessment of the interaction reveals that the coefficient for parental work injuries had a stronger negative relationship with mental health

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<sup>1</sup> There was no significant difference in the interaction effect between those employed at the time of survey and those not employed at the time of survey. We thank an anonymous reviewer for asking us to test this possibility.

when work centrality was low ( $b = -.12$ ,  $SE = .02$ ,  $p < .001$ , 95% CI:  $-.17, -.08$ ) than when work centrality was high ( $b = -.04$ ,  $SE = .02$ ,  $p = .039$ , 95% CI:  $-.08, -.00$ ), in support of the buffering hypothesis.

## 5. Discussion

The current study investigated the relationship between parents' work-related lost-time injuries and their children's mental health. We found that parental job-related injuries were associated with lower child mental health controlling for child age and gender. Further, higher levels of work centrality were related to better mental health and the interaction between parental job-related injuries and work centrality was significant. The significant interaction supports the notion that work centrality is a personal resource that might enable children who identify with work more to see parental injuries in a less negative light than children who identify with work less.

The current findings have several implications worth noting. First, although we cannot determine from the current findings whether parental work injuries and decrements in children's mental health co-occur, parents should be cognizant of their children's mental health when parents experience a work-related injury. This may open a dialogue between parents and children about the nature of work, particularly the importance of physical safety at work, as well as anticipating possible changes in family functioning that may occur in the case of parental injury (Kosny et al., 2018). Second, and relatedly, exploring a family climate for work safety may be a helpful extension of family climate for road safety (e.g., Taubman-Ben-Ari & Katz-Ben-Ami, 2013) in understanding how children make sense of their parents' and ultimately their own work safety related experience. As children gain their own experience of work, part of which may unfortunately involve getting injured at work, we anticipate that the influence of parents' work

experience in shaping children's work centrality and mental health will diminish. The relative importance of work-based and family-based safety climate remains an area for future research.

### *5.1. Study limitations*

Four limitations of this research are worth noting. First, the survey instrument was short and conducted at a single time point, leading to potential shortcomings in the type and quality of data collected. Although we asked participants about the number of their parents' lost-time work injuries, we do not have detailed descriptions of the nature of the injuries experienced (i.e., physical, psychological, duration of injuries, or length of recuperation); the extent to which the participants had (i.e., single- or two-parent families) or identified with one or both of their parents (indicating a possible salience of injuries of one parent over the other); or a baseline measure of children's mental health. Further, the ordinal measures of parental injuries, the two-item measure of mental health, and the four-item measure of work centrality are likely not as valid as the full versions of the measures.

Second, there is a possibility that children (as young as ten years old in this sample) may not comprehend the work centrality items used (e.g., "I expect work will be very central to my existence") in the same way adults do. Paullay et al.'s (1994) items were developed with employed adults and it is common to develop child-appropriate scales for constructs ordinarily completed by adults (e.g., adolescent versions of mental health measures, Luthar et al., in press). As such, the extent to which participants made sense of work centrality items in the same way across the eight-year age range is unclear, despite the items being likely understandable by the average respondent's reading level.

Third, children often report being unaware of parental trauma, including serious life-threatening accidents, with more accurate knowledge of fathers' trauma than mothers' trauma

(Duarte et al., 2019). This calls into question the extent to which children may be unintentionally under-reporting parental work injuries, and in turn the underestimation of the relationship between parental work injuries and children's mental health.

Finally, family socioeconomic status may be an unmeasured confound in this study, serving as a plausible alternative explanation of the findings.<sup>2</sup> Parents who are at risk of work-related injuries are more likely to have physical-oriented jobs, which are not paid as well as with non-physical-oriented jobs (Yuma-Guerrero et al., 2018). Lower family income is a measure of lower socioeconomic status, which has been linked with children's mental health problems (Reiss, 2013), as well as both lower parental transmission of work centrality and mean levels of work centrality among children (Kittel et al., 2019). Future research needs to consider the relationship between and among these three variables and socioeconomic status of the family.

## **6. Conclusion**

In conclusion, the current findings show the relationship between more frequent parental injuries and children's mental health, and that this relationship may be buffered in children with high work centrality. These findings have implications for how children are socialized directly and vicariously into the world of work, and more specifically the extent to which parents' work experiences such as injuries may differentially affect children's mental health.

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<sup>2</sup> We thank an anonymous reviewer for suggesting this point.

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**Table 1***Frequency and percentage of employment status by age of participants*

	Age of participants (in years)								
	10	11	12	13	14	15	16	17	18
Employed	20 (42%)	45 (38%)	182 (44%)	808 (49%)	495 (34%)	166 (18%)	21 (9%)	2 (40%)	1 (13%)
Unemployed	28 (58%)	73 (62%)	232 (56%)	847 (51%)	984 (66%)	762 (82%)	208 (91%)	3 (60%)	7 (87%)

**Table 2***Means, standard deviations, and zero-order correlations between study variables*

	<i>M</i>	<i>SD</i>	1	2	3	4
1. Age	13.67	1.17	-			
2. Gender	.54	.50	.02	-		
3. Parental Work Injuries	.71	.92	-.02	-.01	-	
4. Work Centrality	3.38	.79	-.01	.03*	.05**	-
5. Mental Health	3.79	.75	.02	.13***	-.09***	.13***

*Note:*  $N = 4,884$ . Gender: female = 0, male = 1.\*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$ .

**Table 3**

*Parental work injury and work centrality on children's mental health, controlling for age and gender (N = 4,842)*

<i>Variable</i>	Comparison Model					Hypothesized Model				
	<i>b</i>	<i>SE</i>	<i>p</i>	95% <i>CI</i>		<i>b</i>	<i>SE</i>	<i>p</i>	95% <i>CI</i>	
				<i>LL</i>	<i>UL</i>				<i>LL</i>	<i>UL</i>
Age	.02	.02	.439	-.02	.05	.02	.02	.454	-.02	.05
Gender	.17	.02	.000	.13	.21	.17	.02	.000	.13	.21
Parental Work Injuries	-.19	.03	.000	-.26	-.13	-.23	.03	.000	-.30	-.17
Work Centrality	.21	.02	.000	.17	.26	.23	.02	.000	.18	.27
Parental Work Injuries × Work Centrality						.12	.03	.000	.06	.18

*Note:* outcome = mental health (lower scores represent worse mental health); gender: 0 = female, 1 = male.

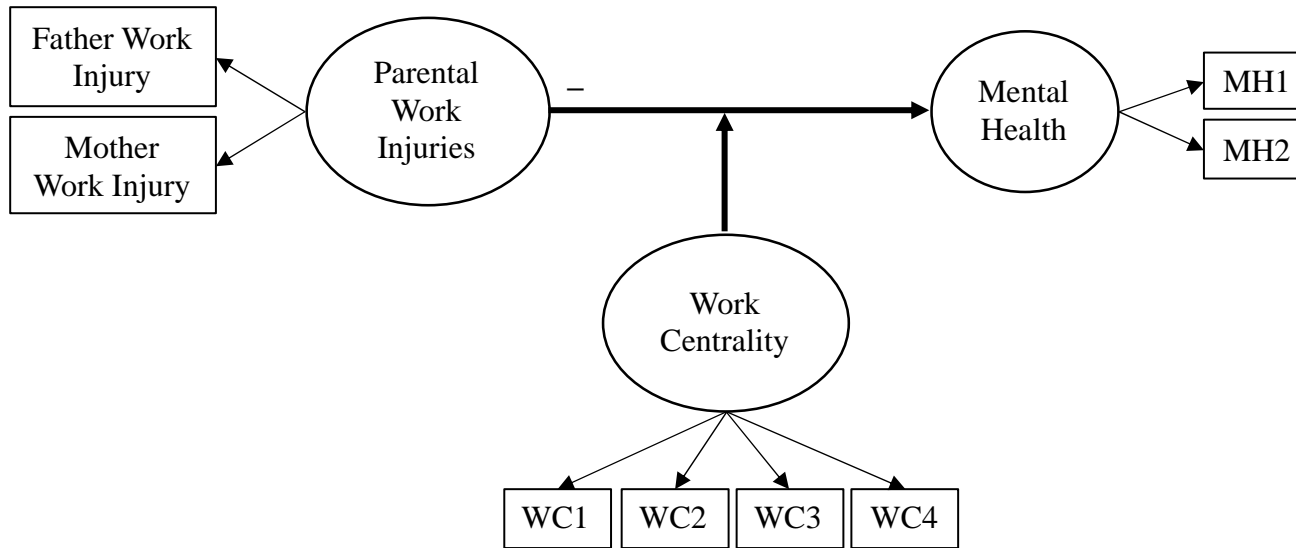


Figure 1. *Study model*

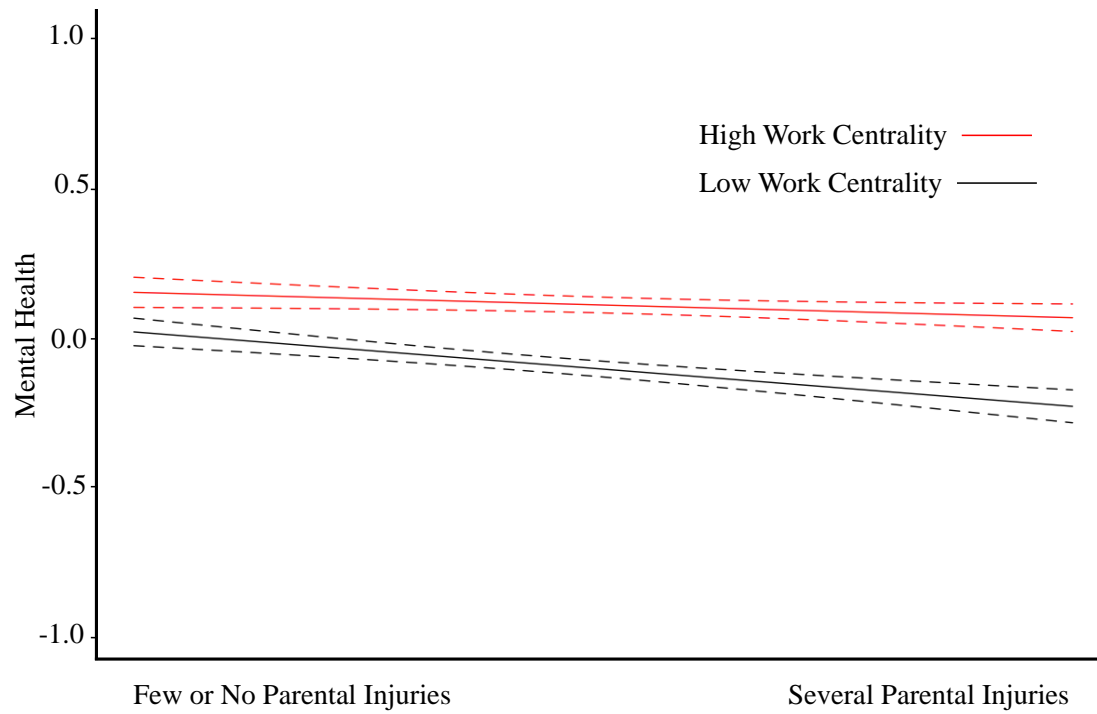


Figure 2. *The latent interaction between parental work injuries and work centrality on children's' mental health, controlling for age and gender. Dotted lines represent 95% confidence bands.*