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The Role of Child Anxiety in Parent Sick Role Reinforcement

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The Role of Child Anxiety in Parent Sick Role Reinforcement

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Arts in Psychology

by

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This thesis is approved for recommendation to the Graduate Council.

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Abstract

A large body of evidence suggests that parents can facilitate offspring anxiety in response to bodily arousal. These learning experiences are referred to as "sick role reinforcement," and are particularly important during adolescence, given the profound bodily changes (e.g., puberty) that characterize this period. Sick role reinforcement is likely important in the context of panic disorder (PD). Panic theorists suggest that parents may enhance panic vulnerability by increasing the threat value of bodily sensations. Although a sizeable body of work has examined the role of parent behavior in these processes, few have examined offspring factors in this process. Additionally, little work has examined how parental anxiety sensitivity (AS) is associated with parental sick role reinforcement. The current study investigates the associations among these variables using a series of vignettes in which parents were asked to imagine their adolescent offspring were describing a number of sensations associated with anxiety to examine the role of adolescent descriptions and parental AS on sick role reinforcement behavior. Results suggested significant effects of both offspring descriptions of bodily sensations and parental AS on parental sick role reinforcement behavior. Findings are discussed in terms of implications for understanding the nature and origins of adolescent panic symptoms and how such information can be utilized to inform prevention and intervention efforts.

Keywords: Adolescents, Parents, Sick Role Learning, Panic, Anxiety Sensitivity

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The Role of Child Anxiety in Parental Sick Role Reinforcement

Rising health care utilization and associated costs are a matter of national concern (Cassel & Brennan, 2007). Elevated health care expenditures are especially relevant in the context of anxiety problems, which are among the most costly psychiatric disorders. Indeed, estimates suggest anxiety-related complaints account for more than 30% ($46.6 billion) of total mental health expenditures in the United States, with nearly half of that figure attributed to repeated use of health care services (Dupont et al., 1996). A key process at play here could be misinterpretation of normal bodily sensations as dangerous, which then contributes to an array of negative consequences with significant developmental and societal costs (e.g., inappropriately seeking health care; school absenteeism; Ehlers, 1993). These processes could have their origins in early experiences, including the process of parental "sick-role reinforcement." The current study uniquely extends the literature by examining factors that may contribute to parents' propensity to reinforce adolescent offspring's sick role behavior.

Overutilization of Health Care: Nature and Consequences

It is imperative that we improve our understanding of the overutilization of health care in anxious families. It is well established that individuals with anxiety disorders, relative to those without such problems, tend to inappropriately utilize health care services (e.g., a panic attack leads to a costly trip to the emergency department; Lynch & Galbraith, 2003). Further, anxiety problems are not often appropriately diagnosed in this context (Weissman, 1990), resulting in recurring utilization of expensive and inefficient methods of symptom management (Lynch & Galbraith, 2003). This trend of frequent health care utilization among anxious individuals may have its origins in early experience; recent research demonstrates that families with anxious children spend 21 times as much on offspring health care as healthy families, and furthermore,

that anxious children are more likely to miss school than non-anxious children (Bodden, Dirksen, & Bogels, 2008).

The Parent-Adolescent Relationship and Sick Role Reinforcement

A key process at play here could be misinterpretation of normal bodily sensations as dangerous, which contributes to an array of negative consequences with significant developmental and societal costs (e.g., inappropriately seeking health care; school absenteeism; Ehlers, 1993). As an illustrative example, an anxious adolescent, compared to a non-anxious youth, may describe benign somatic experiences (e.g., gastrointestinal distress associated with menses) as relatively more upsetting, thereby eliciting differential parent responses (e.g., taking the child to the doctor, allowing him/her to miss school). Given the alarming statistics described above, it is imperative to identify malleable factors that may contribute to these important outcomes among families with anxious youth.

One potentially important, developmentally salient, influence on the development of adolescent anxiety is the parent-child relationship. This is particularly relevant in the context of health care utilization for anxiety-related problems. A relatively large body of work suggests that parents can facilitate offspring fear in response to bodily arousal via vicarious conditioning, operant conditioning, and the verbal transmission of information (Stewart et.al, 2001; Watt & Stewart, 2000; Watt, Stewart & Cox, 1998). For example, parents may positively reinforce fear of bodily arousal by providing special attention to an adolescent's display of fear in the context of somatic sensations. Parents may also negatively reinforce anxious behavior in the context of somatic symptoms by allowing their son or daughter to miss school. Additionally, parents may verbally transmit information regarding the threatening nature of somatic arousal, for example, by telling adolescents that somatic symptoms could be dangerous (Leen-Feldner, Blumenthal,

Babson, Bunaciu, & Feldner, 2008). Finally, offspring could learn to misinterpret somatic symptoms through observational learning; for example, child and adolescent exposure to, and imitation of, parents' anxious interpretation of bodily sensations (Bandura, 1986; Ehlers, 1993). Collectively, these learning experiences are referred to as "sick role reinforcement," and are particularly important during adolescence, given the profound bodily changes (puberty) that characterize this period (Whitehead, Busch, Heller & Costa, 1986; Ehlers, 1993; Reardon, Leen-Feldner, & Hayward, 2009).

Sick role reinforcement is likely important in the context of panic disorder (PD). Panic theorists suggest that parents may enhance panic vulnerability by increasing the threat value of bodily sensations (Craske, 2003; Craske & Rowe, 1997). For instance, Ehlers (1993) found that adults with a history of panic attacks retrospectively report observing their parents performing more sick role behaviors (e.g., skipping social or work obligations) in the context of arousal-reactive symptoms (e.g., dizziness, racing heart), and display higher rates of familial chronic illness, than adults who have not experienced panic attacks. These results suggest these individuals had more opportunities to learn to associate bodily arousal with fear, potentially resulting in stronger associations between fear and bodily arousal. Other work has similarly linked childhood learning experiences with increased panic vulnerability (e.g., Leen-Feldner, Blumenthal, Babson, Bunaciu, & Feldner, 2008; Stewart et al., 2001; Watt, Stewart, & Cox, 1998). It is therefore important to begin to delineate some factors that contribute to sick role reinforcement.

Bidirectional Processes in the Parent-Adolescent Relationship

While parenting behavior clearly drives some aspects of the sick role reinforcement process, little attention has been paid to the role of the child. A wealth of literature suggests

parent-adolescent relationships are bi-directional and that youth influence the parenting they receive (O'Connor, 2002). There are several child factors that may disrupt or direct parental behavior. For example, research demonstrates that conduct disordered boys elicit coercive behavior from both familiar and unfamiliar adults (Anderson, Lytton, & Romney, 1986). This effect is also evident in the domain of anxiety; recent observational work suggests children with elevated anxiety elicit higher levels of maternal control than children low in anxiety (Eley, Napolitano, Lau, & Gregory, 2010). Further observational work found that mothers respond to anxious children with more involvement behavior than non-anxious children, regardless of whether they were interacting with their own or an unrelated child (Hudson, Doyle, & Gar, 2009). Additionally, anxiety disordered children elicit more self-reported negative affect from parents than their non-anxious siblings (Lindhout et al., 2009). While parental behavior clearly relates to offspring anxiety (McLeod, Wood & Weiss, 2007) such "top-down" effects are complemented by offspring contributions to the dyadic process.

The effects of child-driven processes on parent-child interactions may be of particular relevance during adolescence, as this is a developmental period during which a renegotiation of parent-child relationships often occurs in the context of adolescent deindividuation (Laursen, 2009). Thus, adolescent behavior may play a relatively large role in shaping parent-child interactions. Further, child-driven effects may be especially relevant in the context of sick role learning, as adolescents' descriptions of their somatic experiences may drive a parent's subsequent reaction. For example, a parent may be more likely to encourage sick role behavior (e.g., going to the doctor, staying home from school) if an adolescent describes somatic symptoms as anxiety provoking (e.g. "my heart is racing and I am worried I might have a heart

attack,") compared to an adolescent who reports somatic sensations non-anxiously (e.g. "my heart is racing…[but I'm fine]…").

Role of Parental Anxiety Sensitivity in Sick Role Reinforcement Behavior

Another factor that may play a critical role in the sick role reinforcement process is parental anxiety sensitivity (AS). AS is defined as fear of the consequences of anxiety sensations (Reiss & McNally, 1985). As an illustrative example, an individual who is elevated in AS may be concerned that shortness of breath means s/he cannot breathe while an individual who is lower in AS may view the same sensations as being relatively non-threatening. Evidence suggests that AS can be conceptualized as a transdiagnostic vulnerability factor for a number of anxiety disorders and related problems (e.g., Boswell et al., 2013). Recent factor analyses indicate that AS may be best conceptualized as a bifactor model with a global factor that is comprised of three lower-order factors reflecting domain-specific concerns about the consequences of anxiety-related sensations (i.e., physical, mental, and social concerns; Allan, Albanese, Short, Raines, & Schmidt, 2015; Ebesutani, McLeish, Luberto, Young, & Maack, 2014). A large body of work suggests AS is a risk factor for the development of anxiety problems among both adolescents and adults (Hayward, Killen, Kraemer, & Taylor, 2000; Schmidt et al., 2010; Schmidt, Zvolensky, & Maner, 2006; Weems, Hayward, Killen, & Taylor, 2002).

Theory suggests that parents who are elevated in AS may display elevated distress in the presence of anxiety symptoms, and may be more likely to communicate catastrophic outcomes about bodily sensations to their children (Watt et al., 1998). Indeed, evidence suggests that adolescent reports of parental sick role reinforcement relate positively to adolescent AS (Muris, Merckelbach, & Meesters, 2001). Further, parental AS interacts with specific parenting practices

to predict offspring AS (Graham & Weems, 2015). Additionally, in a clinical sample of children and adolescents, parental AS was positively associated with parental reports of offspring panic and separation anxiety symptoms, suggesting parental AS may affect parental perception of offspring symptomology (Francis, 2014). Little work to date, however, has examined how parental AS may affect parental propensity to reinforce offspring sick role behavior. Further, no work to date has examined how adolescent descriptions of bodily sensations may interact with parental AS to affect parental propensity to reinforce sick role behavior. Given the above evidence, it seems likely that parents who are elevated in AS may be more likely to reinforce sick role behavior relative to parents who are comparatively lower in AS.

Current Study

The current study is designed to address these critical gaps in the literature. Parents were presented with a series of vignettes in which they were asked to imagine that their son or daughter reported experiencing symptoms associated with either the physical, cognitive, or mental consequences of anxiety. Parents were presented with a total of two vignettes, in which they were asked to imagine that these sensations were described either anxiously or non-anxiously by their adolescent offspring. It was hypothesized that:

1. Parents would be significantly more likely to reinforce sick role behavior in situations in which offspring describe sensations anxiously rather than non-anxiously.

2. Parents who reported elevated levels of AS would be more likely to reinforce sick role behavior, regardless of symptom presentation, than parents who were relatively lower in AS.

3. These effects would be uniquely related to specific facets of parental AS. For example, after accounting for AS-cognitive and social concerns, parent physical concerns would relate most strongly to sick role reinforcement following an anxious *physical* description.

Method

Participants

Two hundred thirty-eight parents (87 males) between the ages of 24 and 67 years (M_{age} = 38.82, SD = 8.22) were recruited using Amazon.com's M-Turk. MTurk is a website sponsored by Amazon.com that brings together people and tools to enable task creation, labor recruitment, compensation, and data collection. Notably, recent empirical work demonstrated that data collected on M-turk are nearly indistinguishable from data collected in person, and tend to be more demographically diverse than samples collected in person (Buhrmester, Kwang, & Gosling, 2011; Casler, Bickel, & Hackett, 2013). The current subsample was drawn from a larger survey of parents who participated in an original screener (N = 494) and then elected to continue on to "bonus questions" for additional pay (N= 364). Not surprisingly, parents varied in the degree to which they viewed the vignettes as credible (believability ratings ranged from 0 to 100; See Table 3 for the believability ratings of the 364 original parents and the believability ratings of the 238 included in the current study). Notably, results of an independent samples *t*-test indicated that believability ratings were not significantly related to parental total AS scores, $t(364)$ = -1.10, p = .273. Nonetheless, we sought to provide a conservative test of study hypotheses by limiting potential confounds introduced by excluding parents who viewed the vignettes as *highly* improbable. Specifically, we identified a threshold of 25 or higher on the 100-point believability questions. We reasoned this approach would eliminate parents who may have had significant trouble evaluating how they might respond to their child's portrayal of somatic

sensations. Importantly, a power analysis suggested that in order to detect a small effect (power of 0.80, alpha of 0.05) in our primary analyses (Hypothesis 3), a sample of at least 163 participants was needed. Setting the believability cut off at a score of 25 or above resulted in the required sample size. Parents who rated the anxious vignettes (the vignettes included in Hypothesis 3) as at least a 25 on the 0 to 100 believability scale were included in the current analyses based on the completion of all measures included in the current study. Notably, parents included in the current study had relatively high believability ratings for all vignettes.

Chi-square and t-tests were conducted to evaluate differences between individuals who completed all measures and those who did not. No significant differences were observed between completers and non-completers in terms of gender, $\chi^2(1) = 0.10$, $p = .790$, marital status, $\chi^2(3) = 0.79$, $p = .852$, or income $\chi^2(6) = 7.05$, $p = .317$. All parents included in the study reported having at least one child between the ages of 8 and 17 years. If parents reported having more than one child between the ages of 8 and 17 years, parents were instructed to answer questions about the child closet to the middle of the age range ($M_{age} = 11.81$, $SD = 2.87$, 124 males). See Table 1 for additional demographic information.

Materials and Procedure

Demographics. In addition to standard demographic questions (e.g., gender, race/ethnicity, income, marital and caregiver status), parents were asked a series of health care utilization questions, including whether the parent has any chronic health problems or if the family has health insurance (data presented in Table 1).

Anxiety Sensitivity Index-3 (ASI-3). The ASI-3 is a revision of the original Anxiety Sensitivity Index. It is an 18 item self-report measure that assesses fears of the sensations of anxiety. Participants answer questions such as, "It scares me when my heart races," on a five

point Likert-type scale (0 = *very little* to 4 = *very much*). Higher scores indicate higher levels of AS. The ASI-3 evidences strong construct validity (Taylor et al., 2007). In the current study, internal consistencies for the physical concerns facet (α = .90), cognitive concerns facet (α = .90), social concerns facet (α = .80), and total AS (α = .93) were good.

Vignettes. Although there are existing measures designed to index the frequency with which parents engage in specific sick role reinforcement behaviors, these indices do not capture the child driven aspects of the parent-child interaction process. In order to address this gap in the literature, a series of vignettes was developed to assess whether adolescent descriptions of somatic sensations as being either anxiety provoking, or non-anxiety provoking, affect parental sick-role reinforcement behavior. Please see Appendix A for a copy of this measure, developed for the current study. Six versions of the vignettes were administered. Offspring were depicted as describing: i) physical symptoms in an anxiety-relevant manner; ii) cognitive symptoms in an anxiety-relevant manner; iii) social symptoms in an anxiety-relevant manner; and iv) neutral situations (3) in which adolescents do not describe symptoms of anxiety. The neutral vignettes asked parents to consider a context in which their adolescent might describe how they are feeling in benign terms (e.g., "I just got out of gym class and I feel fine"). In the other vignettes, adolescents were portrayed as describing their physical, cognitive and social symptoms in an anxiety-relevant manner (e.g., "My heart is beating really fast and really hard. This is making me feel really nervous and scared."). All vignettes were matched for length and content.

Parents were then asked to rate how likely they would be to encourage sick role behavior in terms of a) special attention, b) health care utilization (e.g., taking the child to the doctor), and c) social-occupational obligations (e.g., allowing the child to come home from school or skip extracurricular activities). A total score for sick-role reinforcement behavior was computed for

each vignette by averaging the five sick role reinforcement questions (scores range from 0-100). Additionally, a total anxious vignette score was computed by averaging together the three anxiety sick role scores, and a total neutral vignette score was computed by averaging together the three neutral vignette sick role scores (alphas= .76 and 77, respectively; scores range from 0-100). Finally, a question assessing vignette credibility were administered following each vignette (e.g., "How believable is this scenario?") in order to address any confounds introduced by asking parents to consider their response to a situation that they view as improbable.

Procedure

Parents were recruited using Amazon.com's M-Turk. After informed consent was obtained, participants were asked to fill out measures described above (randomly ordered to limit order effects). Each parent saw every vignette and were asked to rate how likely they would be to reinforce sick role behavior after each vignette. After participants finished completing the questionnaire battery, they were debriefed and compensated between $2.00 and $5.00 depending on when he/she completed the study (study payment was increased across the course of the study due to initial problems with recruitment). There were no associations between payment level and primary predictor or criterion variables.

Analytic Approach

Following computation of descriptive statistics, paired sample t-tests were used to test the first hypothesis one (i.e., whether parents were more likely to reinforce sick role behavior in situations in which offspring describe sensations anxiously rather than non-anxiously). In order to test the second hypothesis, a repeated measures ANOVA was used to examine whether parental scores on the global AS factor were related to greater parental sick role reinforcement regardless of vignette type (i.e., anxious or non-anxious). Finally, to examine the third

hypothesis, a repeated measures ANOVA was conducted to examine whether sick role reinforcement scores between physical, social, and cognitive anxious vignettes varied as a function of parental scores on the relevant AS lower order factors. Within subjects variables of sick role reinforcement scores by vignette were entered into the ANOVA, while the three lower order factors of AS were entered as between subjects covariates. In the case of significant interactions, planned interaction contrasts were used to probe the interaction. One case was identified as an outlier regarding use of cognitive sick role reinforcement scores as the dependent variable, and was excluded from subsequent analyses. Assumptions associated with each statistical test were test and necessary corrections are noted below.

Results

Descriptive Analyses

See Tables 2, 3, and 4 for descriptive analyses and zero order correlations among descriptive and outcome variables. With regard to continuous variables, sick role reinforcement scores (SRS) for all vignette types related positively to each other (r = .281 - .863 for the six vignettes SRS). The total neutral vignette score (i.e., the average SRS for the three neutral vignettes) was positively associated with the total anxiety vignette score (i.e., the average SRS for the three anxiety vignettes). Additionally, several significant inter-correlations among the ASI facets and SRSs were observed. Parental age related positively to all variables except the anxious social vignette SRS, AS-S, and AS-M. Independent samples t-test indicated that there were no significant differences in terms of parent gender for any of the variables. Please see Table 3 for information about vignette believability.

Primary Analyses

Hypothesis 1. As hypothesized, parents reinforced more sick role behaviors for the anxious vignettes compared to the neutral vignettes, $t(237) = 22.95$, $p < .001$, representing a large effect size, $d = 1.42$. These effects remained when sick role reinforcement was examined by individual vignette type. Parents reinforced significantly more sick role behavior in the anxious physical vignette than in the neutral physical vignette type, $t(237) = 23.17$, $p < .001$, $d = 1.80$. Similarly, parents reinforced significantly more sick role behavior for the anxious social vignette than for the neutral social vignette, $t(237) = 9.76$, $p < .001$, $d = 0.58$. Finally, parents reinforced significantly more sick role behavior for the anxious cognitive vignette than the neutral cognitive vignette $t(237) = 17.53$, $p < .001$, $d = 1.22$.

Hypothesis 2. Results of the ANOVAs are presented in Table 5. As hypothesized, there was a significant main effect of the global factor of parental AS, such that parents who were high in AS reported that they would reinforce more sick role behavior regardless of vignette type (i.e., anxious or non-anxious), this was a small effect. There was also a main effect of vignette type, such that the anxious vignettes resulted in greater sick role reinforcement than the non-anxious vignettes, this was a large effect.

Hypothesis 3. Please see Table 6. There was a significant main effect of anxious vignette type, $F (2, 468) = 5.81$, $p = .003$, this was a small effect. Contrasts revealed that the anxious physical vignette resulted in significantly greater SRS than the cognitive and social vignettes. The social and cognitive vignette SRS were not significantly different from one another. There was also a significant main effect of the AS-P on SRS, such that higher levels of AS-P were related to significantly SRS, regardless of vignette type. There was no significant main effect of either the AS-M or the AS-S. Finally, contrary to hypotheses, there was no significant interaction of AS-P with vignette type, AS-M with vignette type , or AS-S with vignette. This suggests that

parents scores on the lower order facets of AS did not moderate SRS by vignette type, rather parents who were elevated in AS-P were more likely to reinforce sick role behavior in anxious vignettes regardless of the specific domain of concerns discussed in the vignette.

Discussion

Improving our understanding of the role of adolescent descriptions of symptoms of somatic arousal in the sick role reinforcement process is critical for efforts to prevent the occurrence of anxiety and panic related problems. Empirical evidence suggests that parents can facilitate offspring anxiety in response to bodily arousal via vicarious conditioning, operant conditioning, and the verbal transmission of information (Stewart et. al, 2001; Watt & Stewart, 2000; Watt, Stewart & Cox, 1998). Little work to date, however, has examined child-driven effects in this process, despite evidence that youth likely influence the parenting they receive (O'Connor, 2002). In addition, no studies to date have examined how parental individual difference factors may affect parental propensity to reinforce sick role behavior. The current study used a series of vignettes to examine the role of adolescent descriptions of somatic arousal and parental AS levels on parental sick role reinforcement behavior in order to address this gap in the literature.

First, as hypothesized, there was a significant effect of vignette type on parental sick role reinforcement behavior. Specifically, parents reported that they would reinforce significantly more sick role behavior following vignettes in which symptoms of somatic arousal were described anxiously compared to vignettes in which somatic symptoms were described non-anxiously. These data are consistent with previous findings suggesting that anxious children elicit distinct responses from mothers as compared to non-anxious children (Eley et al., 2010). These data also accord with theoretical assertions that adolescent regulation abilities may

influence parenting behavior (Laursen, 2009), suggesting that adolescents who are poor at regulating their affect in the presence of sensations of somatic arousal may elicit more parental sick role reinforcement behaviors (e.g., excusing them from chores). In other words, adolescents prone to portraying interoceptive sensations in an anxiety-relevant manner may, for example, be more likely to be the recipient of unnecessary health care. These findings provide an important extension to the extant literature, which currently includes little data regarding the role of adolescent descriptions of bodily sensations on the sick-role reinforcement process. However, a key next step in this line of work will be to conduct more rigorous tests of the hypotheses. For example, it will be important to examine these processes using experimental work with parent-child dyads (e.g., Hudson et al., 2009) rather than a vignette in which parents are asked imagine their child is reporting symptoms in an anxious or non-anxious manner. The current study sets the stage for these types of investigations.

Second, as hypothesized, parents who reported elevated levels of global AS reported that they would reinforce more sick role behavior, regardless of whether the symptom presentation was anxious or non-anxious in nature. This is the first study to examine the relation between parental AS and sick role reinforcement behavior. These findings correspond with theoretical accounts suggesting that parents who are elevated in AS may be more likely to communicate catastrophic outcomes about bodily sensations to their children (Watt et al., 1998), as well as evidence that parents who are elevated in AS may use more "anxious" parenting strategies (e.g., Craske, 2003) regardless of child behavior. Further, these findings fit with data suggesting high-AS parents use more maladaptive parenting styles (e.g., more conflictual, controlling family environments Drake & Kearny, 2008). Taken with the results of the first hypothesis, these findings suggest that there are complex processes at play in the development of anxiety, wherein

parents and adolescent offspring may bi-directionally influence each other in the development of anxiety. Notably, these findings suggest that parent characteristics may play an important role in the process; parents who were elevated in AS reinforced more sick role behavior, regardless of adolescent behavior. These findings are consistent with current models of child anxiety, which highlight both shared genetic vulnerabilities and the reciprocal relationship between parent and child behaviors in both the development and maintenance of anxiety (Rapee, Schniering, & Hudson, 2009). Future work is needed to better understand the nature of these relations. An important next step will be the use of prospective time sampling methodologies to examine the interactive effects of parental AS and offspring anxiety in "real world" contexts to examine how these factors may relate to sick role reinforcement over time.

Third, contrary to hypotheses, there was no interaction between parental lower order AS factors and anxious vignette types. There was, however, a significant main effect of parental AS-physical concerns; parents who were high in this dimension were more likely to reinforce sick role behavior for all anxious vignettes than parents who were lower. There was also a significant main effect of vignette type; the physical anxious vignette resulted in greater sick role reinforcement than either the anxious cognitive vignette or the anxious social vignette. These results may be driven, in part, by the relevance of physical sensations to sick role behavior. Indeed, it makes intuitive sense that when offspring display anxiety in the presence of physical symptoms, parents may be more likely to take them to the doctor, or tell them to go lay down, than when offspring complain of cognitive or social symptoms of anxiety. These processes may explain why the physical vignette resulted in the highest levels of sick role reinforcement. Indeed, previous evidence suggests that adults with panic disorder retrospectively report having received more sick role reinforcement behavior from parents in the presence of panic symptoms

than in the presence of colds (Ehlers, 1993), suggesting that parental sick role reinforcement behavior may show some specificity to "arousal-reactive" symptoms such as dizziness, racing heart, and other symptoms that also overlap with panic. Further, given that individuals who are high AS-physical concerns believe that physical sensations associated with anxiety are dangerous, parents who are elevated in this sub-factor may be particularly likely to reinforce sick role behavior in the presence of offspring physical anxiety symptoms. Notably, in the current study, the lower order AS factors did not interact with vignette type, suggesting that both specific parental AS factors and adolescent anxiety may independently relate to parental sick role reinforcement behavior. Subsequent work would benefit from examining these relations in a more refined context, for example, examining how parental AS may relate to specific elements of sick role reinforcement (e.g. positive reinforcement, negative reinforcement, modeling), and examining factors that may moderate the relation between parent AS and parenting behavior (e.g., child gender, Graham & Weems, 2015).

In addition to those already discussed above, a number of issues warrant further consideration. First, this study primarily utilized self-report data, and is therefore susceptible to affect, recall, and social desirability biases (e.g., Nisbett & Ross, 1980). Future would work benefit from using experimental paradigms in which adolescent descriptions of somatic arousal (e.g., voluntary hyperventilation; Hornsveld, Garssen, Dop, & Van Spiegel, 1990) or parental AS (e.g., Mitchell, Capron, Raines, & Schmidt, 2014) are manipulated in the laboratory context. Second, this study was cross-sectional, which precludes inferences about causality. Although preliminary evidence for child-driven effects emerged in the current study, little is known about offspring learning history. It is possible that parents who reported that they would reinforce more sick role behavior in the context of an anxious description by their adolescent offspring have a

longstanding history of doing so "in real life." Second, this sample was relatively homogenous (e.g., primarily Caucasian). Given evidence that racial and ethnic differences may be important considerations when examining phenomenology related to panic (e.g., Hollifield, Finley, & Skipper, 2003) and parenting behavior (Nam, Wikoff, & Sherraden, 2015), it will be critical for future work to examine the current research questions in a more diverse sample. Third, these data were collected in an unselected sample of parents of adolescents. Future work would benefit from examining these relations in a clinical sample (e.g., a sample of parents with anxiety disorder, or a sample where offspring have an anxiety disorder diagnosis) to examine if this pattern of results persists.

These limitations notwithstanding, the current study represents a valuable extension to the literature by being the first study to demonstrate that adolescent offspring descriptions of somatic sensations play a critical role in influencing parent sick role behavior. Additionally, the study demonstrated that parents are particularly likely to reinforce sick role behavior in the context of offspring anxious descriptions of physical sensations. Finally, the current study is the first to demonstrate that parents who are elevated in AS (physical concerns) may be more likely to reinforce sick role behavior than parents who have relatively lower levels of AS. These findings lay the ground work for future work targeted at improving our understanding of the role of parent and adolescent features that may promote sick role reinforcement behaviors, and thereby potentiate risk for anxiety development. Notably, AS is malleable when targeted by prevention (e.g., Schmidt et al., 2007) and cognitive-behavioral interventions (Otto, Reilly-Harrington, & Taylor, 1999), suggesting that reduction of parental AS may result in a reduction in sick role reinforcement behavior. In addition, given that parents are the primary agents of socialization for their offspring (Grusec & Davidov, 2007), providing parents with specific

strategies to avoid reinforcing sick role behavior in the presence of adolescent offspring anxiety

may represent a critical prevention strategy for reducing the incidence of anxiety and panic

related problems.

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Table 1

Demographic Information

Caretaker Status	n	%
Married Co-Parent (e.g., duties split equally with a partner)	109	46.00%
Married Primary Caretaker (e.g., primarily responsbible for child)	52	21.90%
Seperated or Divorced Primary Caretake	21	8.90%
Seperated or Divorced Co-parent (i.e., duties split equally with former partner)	19	8.00%
Single Parent	18	7.60%
Caretaker on Weekend or fewer than three days a week	1	0.40%
Co-parenting with a partner	12	5.10%
Primary Caretaker with a Partner	5	2.10%

Race	n	%
Caucasian/White	208	87.40%
African American/Black	20	8.40%
Asian American	4	1.70%
Hispanic/ Latino	11	4.60%
Native American	2	0.80%

Parent Gender	n	%
Male	87	36.60%
Female	151	63.40%

Offspring Gender	n	%
Male	124	52.10%
Female	114	47.90%

Do you have health insurance	n	%
Yes	221	92.90%
No	17	7.10%

Suffer from Chronic Health Problem?	n	%
Yes	58	24.50%
No	179	75.50%

Study Payment Level	n	%
$2.00	91	38.20%
$5.00	147	61.80%

Annual Family Income:	n	%
Less than $20,00 per year	17	7.10%
$20,001-$40,000 per year	57	24.20%
$40,001- $60,00 per year	67	28.40%
$60,001-$70,000 per year	25	10.60%

$70,001-$90,000 per year	29	12.30%
$90,001-$100,000 per year	9	3.80%
More than $100,000 per year	32	13.60%

Table 2

Descriptives and Zero Order Correlations

	PhysA	PhysN	CogA	CogN	SocA	SocN	TotA	TotN	AS_P	AS_M	AS_S	Age
PhysA	1	.281***	.575***	.283***	.457***	.329***	.817***	.362***	.125	.010	-.005	.157*
PhysN		1	.339***	.681***	.304***	.427***	.376***	.825***	.188**	.231***	.125	.141*
CogA			1	.423***	.499***	.409***	.845***	.474***	.208**	.147*	.035	.107
CogN				1	.321***	.493***	.418***	.863***	.193**	.222**	.112	.132*
SocA					1	.589***	.800***	.502***	.163*	.091	.098	.063
SocN						1	.542***	.799***	.138*	.054	.053	.165*
TotA							1	.545***	.202***	.103	.053	.131*
TotN								1	.207***	.196***	.114	.178**
AS_P									1	.740***	.608***	-.063
AS_M										1	.589***	-.169**
AS_S											1	-.116
Age												1

Note: N = 298. PhyA = Sick Role Reinforcement (SRS) scores for the anxious physical vignette; PhyN = SRS for the neutral physical vignette; CogA = SRS for the anxious cognitive vignette; CogN = SRS for the neutral cognitive vignette; SocA = SRS for the anxious social vignette; SocN = SRS for the neutral social vignette; TotA= SRS for the anxiety vignettes averaged; TotN = SRS for the neutral vignettes averaged; AS_P = Anxiety Sensitivity Physical Concerns; AS_M = Anxiety Sensitivity Mental Concerns; AS_S = Anxiety Sensitivity Social Concerns; vignettes scored on a 0 to 100 scale.

* $p < .05$

** $p < .01$;

*** $p < .001$

Table 3
Average Believability Ratings

N = 364	M(SD)	M(SD)
	Anxious Vignette	Neutral Vignette
Physical Symptoms	72.25 (30.45)	50.97 (37.84)
Cognitive Symptoms	65.91 (31.66)	51.67 (39.95)
Social Symptoms	64.94 (33.50)	57.66 (35.36)
N = 238	M(SD)	M(SD)
	Anxious Vignette	Neutral Vignette
Physical Symptoms	80.71 (22.32)	58.10 (36.21)
Cognitive Symptoms	75.46 (23.64)	59.75 (33.77)
Social Symptoms	74.43 (24.29)	64.84 (31.27)

Note: Ratings on a scale of 0 to 100

Table 4
Average SRS Ratings

N = 364	M(SD)	M(SD)
	Anxious Vignette	Neutral Vignette
Physical Symptoms	70.46 (24.00)	26.78 (24.50)
Cognitive Symptoms	63.46 (25.53)	31.93 (26.13)
Social Symptoms	61.30 (25.58)	45.16 (30.05)

Note: Ratings on a scale of 0 to 100

Table 5
Parental AS and Adolescent Descriptions

	df	F	η_p^2	p
Parental AS	(1,236)	9.16	0.04	.003
Vignette Type	(1,236)	80.48	0.25	<.001

Table 6
Parental AS and Adolescent Description Type

	df	F	η_p^2	p
Physical vs. Cognitive	(1,234)	6.52	0.03	.011
Cognitive vs. Social	(1,234)	0.89	0.00	.345
AS-P	(1,234)	9.93	0.04	.002
AS-M	(1,234)	0.59	0.00	.444
AS-S	(1,234)	1.27	0.01	.262
AS-P x Vignette	(2,468)	0.34	0.00	.712
AS-M x Vignette	(2,468)	1.67	0.01	.189
AS-S x Vignette	(2,468)	2.08	0.01	.126

Note: AS_P = Anxiety Sensitivity Physical Concerns; AS_M = Anxiety Sensitivity Mental Concerns; AS_S = Anxiety Sensitivity Social Concerns

Appendix A

Imagine you have the day off of work and you receive the following call from your child while you are at home:

Physical:
"Hello. I just got out of gym class and I wanted to give you a call. My heart is beating really fast and really hard. This is making me feel really nervous and scared. I'm worried that it means that something is really wrong with me. Now I'm starting to sweat and it is really freaking me out. I really want to leave; I don't want to be here anymore. I am feeling sick and I am worried that something is wrong with my body. I think I want to go home."

Neutral:
"Hello. I just got out of gym class and I wanted to give you a call. We had an intense class. Although I was sweating a lot, I now feel fine and I am getting ready for my next class. All of the other students are getting ready to go to class - I think that I am going to walk to my classroom with them. I am ready for the rest of the day and I'm not too concerned. Although I think I can get everything done without too much trouble, I think I want to go home."

Cognitive:
"Hello. I just got out of gym class and I wanted to give you a call. My mind keeps racing and I cannot focus on anything. This is making me feel really nervous and scared. I'm worried that it means that something is really wrong with me. Now my thoughts are really starting to speed up and it is really freaking me out. I really want to leave; I don't want to be here anymore. I cannot control my thoughts and I am worried that something is wrong with my brain. I think I want to go home."

Neutral:

"Hello. I just got out of gym class and I wanted to give you a call. We had an intense class. Although my mind keeps racing, I feel fine and I am getting ready for my next class. All of the other students are getting ready to head to class - I think that I am going to walk to my classroom with them. I am ready for the rest of the day and I'm not too concerned. Although I think I can get everything done without too much trouble, I think I want to go home."

Social:
"Hello. I just got out of gym class and I wanted to give you a call. I keep jumbling my words when I try to talk to people and I am really worried that people are going to think I'm weird. This is making me feel really nervous and scared. I'm worried that it means that something is really wrong with me. Now I'm starting to blush and it is really freaking me out. I really want to leave; I don't want to be here anymore. I feel really embarrassed and I am worried that people are going to think that I'm strange. I think I want to go home."

Neutral:

"Hello. I just got out of gym class and I wanted to give you a call. We had an intense class. Although I keep jumbling my words when I talk to people, I feel fine and I am getting ready for my next class. All of the other students are getting ready to go to class - I think that I am going to walk to my classroom with them. I am ready for the rest of the day and I'm not too worried. Although I think I can get everything done without too much trouble, I think I want to go home."

Questions following the vignettes:
1. If this happened to you, how much danger would you think your child was in? (0-100)
2. If your child were to say this to you, how anxious would it make you feel? (0-100)
3. If your child were to say this to you, how likely would you be to allow your child to leave school? (0-100)
4. If your child were to say this to you, how likely would you be to reassure your child and give them special attention? (0-100)
5. If your child were to say this to you, how likely would you be to take your child to the doctor? (0-100)
6. How believable is this? (0-100)

Appendix B

UNIVERSITY OF ARKANSAS

July 29, 2014

MEMORANDUM

TO:	Sarah Bilsky
	Emily Mischel
	Audrey Doak
	Ashley Knapp
	Ellen Leen-Feldner

| FROM: | Ro Windwalker |
| | IRB Coordinator |

| RE: | New Protocol Approval |

| IRB Protocol #: | 14-07-024 |

| Protocol Title: | *Parents and Adolescents* |

| Review Type: | ☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB |

| Approved Project Period: | Start Date: 07/29/2014 Expiration Date: 07/28/2015 |

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of one year. If you wish to continue the project past the approved project period (see above), you must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the expiration date. This form is available from the IRB Coordinator or on the Research Compliance website (http://vpred.uark.edu/210.php). As a courtesy, you will be sent a reminder two months in advance of that date. However, failure to receive a reminder does not negate your obligation to make the request in sufficient time for review and approval. Federal regulations prohibit retroactive approval of continuation. Failure to receive approval to continue the project prior to the expiration date will result in Termination of the protocol approval. The IRB Coordinator can give you guidance on submission times.

This protocol has been approved for 1,000 participants. If you wish to make *any* modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes.   All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.