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Read-react-respond: An integrative model for understanding sexual revictimization

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Repeated sexual victimization is associated with a multitude of adverse effects for female victims, including physical health problems, mental health problems, and risky sexual behaviors (for reviews see [Arata, 2002](#); [Breitenbecher, 2001](#)). Females who were sexually abused in childhood are especially vulnerable to revictimization: this population is 2–3 times more likely to be sexually assaulted in adolescence and adulthood than females without a sexual abuse history ([Barnes, Noll, Putnam, & Trickett, 2009](#)). Given that adolescence is a period when females spend increasing amounts of time in unsupervised contexts where sexual behavior—and coercion—is more likely to occur, understanding how sexual abuse increases adolescents' risk for sexual assault and how this risk can be reduced has critical implications for their healthy development. However, the mechanisms that explain why sexually abused females are more vulnerable to later victimization are not clear. In

this paper, we present a conceptual model for understanding revictimization that integrates work on cognitive, emotional, and behavioral factors with biological processes that underlie the human stress response, and describes mechanisms by which sexual abuse in childhood may undermine adaptive responding to sexual threats. We focus on females' responses to sexual threat because research on sexual revictimization has utilized female samples nearly exclusively. Although we do not propose that the processes described in the model are specific to females, we also cannot assume that they generalize to males in the absence of empirical data.

Childhood Sexual Abuse and Sexual Revictimization

Conceptual models developed to understand revictimization have identified a range of factors that may increase the risk that sexually abused females will be assaulted in adolescence and adulthood. Some offer an ecological perspective that views that revictimization as embedded in a broader social context that includes cultural, economic, and family constructs ([Grauerholz, 2000](#); [Messman-Moore & Long, 2003](#)). These models also incorporate individual factors that increase females' exposure to people and situations where sexual coercion is more likely to occur, such as alcohol and drug use and more frequent sexual activity, and impair their ability to respond effectively to sexual threats. Understanding the social and cultural forces that contribute to violence against women is important for a comprehensive understanding of sexual revictimization; however, adolescents are likely to confront situations in which they are pressured for sex whether or not they have been sexually active or used alcohol or other substances. Therefore, investigating the processes that lead to more or less effective responses to sexual threat is essential for understanding why victims of childhood sexual abuse are more vulnerable to revictimization and for reducing their risk of sexual assault.

Identifying controllable factors that may help females avoid or resist sexual assault does not remove the onus of responsibility from the perpetrator of the assault; rather, it is one of many strategies being pursued in the interest of reducing interpersonal violence. This approach has led to the development of date rape prevention programs on college campuses and school-based programs such as "Safe Dates" that seek to reduce physical and sexual aggression in adolescence by targeting risks for both perpetration and victimization (e.g., [Foshee, Reyes, & Wyckoff, 2009](#)). Although potentially valuable for all youths, such programs are especially important for identifiable subsets of the population that are at substantially higher risk of victimization. A recent longitudinal study showed that the victims of sexual assault are heterogeneous, and identified four patterns of victimization from adolescence through early adulthood: no or consistently low level of victimization, repeated victimization experiences, increasing from adolescence through the end of college and decreasing from adolescence through the end of college ([Swartout, Swartout, & White, 2010](#)). Each of the three groups reporting elevated levels of victimization reported significantly more adverse childhood events, including sexual abuse, than females with consistently low rates of victimization. Unfortunately, it appears that programs designed to help females avoid sexual assault are *lesseffective* for girls who have been sexually abused (e.g., Rothman & Silverman, 2007). Consequently, identifying the factors that increase the vulnerability of adolescents who have been sexually abused in childhood is a critical step toward developing more efficacious programs for this population and serves an important complement to social policy, legal and psychological approaches aimed at reducing the perpetration of violence.

Research on sexually abused females' responses to sexual threat has focused primarily on the hypotheses that they exhibit impairments in their ability to (a) recognize these threats and (b) engage in coping behavior that is likely to be more effective in repelling or escaping a potential assault (e.g., [Arata, 2002](#); [Macy, 2007](#); [Marx, Calhoun, Wilson, & Meyerson, 2001](#); [Messman-Moore & Long, 2003](#); [VanZile-Tamsen, Testa, & Livingston, 2005](#)). Perceptions of sexual threat typically have been assessed with written or audiotaped vignettes portraying an interaction between a man and woman that becomes increasingly sexual and ultimately results in an assault. Risk perception is measured by asking participants to indicate when they think that the situation has become

dangerous for the woman (e.g., “when the man has gone too far”). The empirical data examining the association between threat perception and childhood sexual abuse are mixed. Some studies show that women reporting repeated sexual victimization experiences exhibited longer latencies in labeling situations as dangerous than those with one or no incidents of victimization (e.g., [Wilson, Calhoun & Bernat, 1999](#)), but others failed to find an association between abuse history and threat perception (e.g., [Breitenbecher, 1999](#); [Messman-Moore & Brown, 2006](#)). Further, difficulty perceiving threat has not been established as a risk factor for sexual assault, with several studies failing to show that perception of threat cues predicts later victimization ([Breitenbecher, 1999](#); [Cue, George, & Norris, 1996](#); [VanZile-Tamsen et al., 2005](#)).

Studies examining whether sexually abused females exhibit less effective behavioral responses to sexual threat have been more supportive. For example, research using standardized written vignettes has found that women who had experienced prior sexual victimization (that could include, but was not limited to childhood sexual abuse) took longer to indicate that they would leave a threatening situation ([Messman-Moore & Brown, 2006](#)) and were more likely to indicate that they would use less direct and assertive forms of resistance ([VanZile et al., 2005](#)). In an effort to understand the factors that lead to different types of responses to sexual assaults, [Nurius and Norris \(1996\)](#) developed a framework that emphasized the role of cognitive appraisals and emotions as determinants of coping behavior. Studies testing this framework typically have asked college undergraduates who had experienced a sexual assault in the previous five years to report on their thoughts, feelings, and behavior during the interaction (e.g., [Nurius, Norris, Young, Graham, & Gaylord, 2000](#); [Nurius, Norris, Macy, & Huang, 2004](#); [Macy, Nurius, & Norris, 2007](#)). They found that several types of appraisals, including blame for the assault, concerns about preserving the relationship, judgment by the male, and potential injury, and emotional reactions predicted whether they engaged in assertive behavior (e.g., raised voice, pushed him away), diplomatic responses (e.g., told him I wasn't ready for this, made excuse), and immobilization (e.g., felt paralyzed, struggled at first but stopped because it was hopeless). However, these studies did not examine whether women who had experienced sexual abuse in childhood reported different appraisals, emotions, or behavioral responses.

Although there has been progress in identifying factors that may increase females' vulnerability to revictimization, conceptual work in this area is limited by the failure to incorporate one of the most salient aspects of sexual assault: the high level of physiological arousal it elicits. The imminent threat of harm engages a powerful biological response designed to avoid or combat the threat; if this system is functioning normally, then accurate appraisal of threat is likely to promote effective coping efforts. However, if these physiological processes are disrupted or dysregulated, sexual threats instead may impair cognitive processes such as attention, problem-solving, memory, and decision-making (e.g., [DeBellis, 2001](#); [van der Kolk, 2006](#); [Watts-English, Fortson, Gibler, Hooper, & DeBellis, 2006](#)) and lead to ineffective behavioral responding. Research on the sequelae of early trauma indicates that childhood sexual abuse can lead to long-term dysregulation in the functioning of biological stress responses (e.g., [DeBellis, 2001](#); [van der Kolk, 2006](#)), and thus may be a mechanism that explains why victims of sexual abuse are at elevated risk for revictimization.

Failure to consider the role of physiological responding also limits the conclusions that can be drawn from empirical research on females' responses to sexual threats. Written and audiotaped vignettes enable participants to remain distanced from the emotions and physiological responses that ordinarily occur in response to threat, and if these paradigms do not arouse physiological arousal, reports of perceived threat or coping behavior may not accurately reflect what happens in an emotionally charged situation. In addition, the highly structured nature of written and audio vignettes requires simple behavioral responses that limit the potential to assess how individuals think, act, and feel in these situations. Retrospective reports can provide information about females' responses to actual assaults, but are subject to memory and reporting biases. Thus,

methodological limitations of this literature make it premature to draw conclusions about the role of threat and coping in sexual victimization.

We believe that integrating work on physiological responses to stress with research on cognitive and behavioral processes offers a more comprehensive and cohesive framework for understanding females' responses to sexual threat and why sexually abused females are at heightened risk for sexual assault in adolescence and adulthood. Next, we describe this framework and address its implications for research and intervention.

The Read-React-Respond (RRR) Model

Consistent with a developmental psychopathology perspective, the Read-React-Respond (RRR) model describes the processes involved in adaptive responses to sexual pressure or coercion and identifies how disruptions in these processes can increase risk for victimization. The model proposes that adaptive responding to sexual threat involves three interrelated processes: (a) The individual must accurately *read* the situation by recognizing coercion cues and prioritizing self-protection over other social or personal goals; (b) the perception of threat then triggers a biological *reaction* that increases physiological arousal, motivates action and elicits emotion; and (c) the individual engages in behavioral *responses* intended to stop the advances or remove the individual from the situation. Thus, in the RRR model, biological processes play a central role in understanding the links perceiving threat and coping behavior.

Read

“Reading” refers to evaluating the meaning of the situation, which involves not only recognizing potential danger but evaluating it in relation to the individuals' needs and goals. The context in which sexual victimization most often occurs in adolescence plays a significant role in understanding why threats can be difficult to read. Sexual assaults in adolescence and early adulthood tend to occur in familiar social settings and are more likely to be perpetrated by an acquaintance than by a stranger or a partner in a committed relationship ([Livingston, Hequembourg, Testa, & VanZile-Tamsen, 2007](#); [Tjaden & Thoennes, 2000](#)), and females typically do not expect to be assaulted by acquaintances ([Nurius et al., 2000](#)). Threatening behavior in these situations may be subtle and ambiguous, and it may be difficult to ascertain whether a male is being friendly, flirtatious, or coercive. Further, these interactions take place in a developmental context in which establishing identity, independence, intimacy are salient tasks ([Nurius et al., 2004](#)); even if females accurately perceive a behavior as coercive or aggressive, threat cues may be downplayed or dismissed in the service of social or affiliation goals. The RRR model proposes that there are four factors that can influence how adolescent females read potentially dangerous situations that may be influenced by experiencing sexual abuse in childhood.

Sexual attitudes

First, some females who have been sexually abused exhibit a heightened propensity for engaging in sexual activity and entertaining sexual thoughts and impulses. [Finkelhor and Browne's \(1985\)](#) traumagenic dynamics model holds that one effect of sexual abuse is “traumatic sexualization,” which involves increased interest in sexual issues and media and early and more frequent sexual behavior. As compared to their nonabused peers, sexual abuse victims have been shown to have earlier coital initiations ([Fergusson, Horwood, & Lynskey, 1997](#)), have more sexual partners ([Luster & Small, 1997](#)), engage in risky sexual behavior ([Buzi et al., 2002](#)) and are more likely to become pregnant as teenagers ([Noll et al., 2009](#)). There is also emerging evidence that sexually abused females may develop certain sexual attitudes or distorted sexual cognitions that may play a role in their propensity to engage in risky sexual activity. For example, [Noll and colleagues \(2003\)](#) have shown that sexually abused females report greater preoccupation with sex (defined by intrusive sexual thoughts, pornography consumption, frequent masturbation, and other aspects of precompulsive sexual cognitions) than nonabused females which, in turn, accounted for individual differences in subsequent HIV-risk behaviors and teen

pregnancy ([Noll et al., 2003](#)). Sexual preoccupation may be indicative of internalized sexual compulsions and/or aversions that develop out of the shame or stigma associated with being abused. Moreover, adolescence is a period of particular vulnerability for victims because issues that are reminiscent of abuse, such as dating, sexual identity, and the fielding of sexual advances are some of the defining tasks of adolescence. Hence, females who are more preoccupied with sex may be highly motivated to engage in sexual behavior and may misconstrue or minimize threat cues in favor of sexual interest and motivation.

Attachment style

Second, sexual abuse often co-occurs with other problems in parent–child relationships that undermine the development of secure attachment (e.g., [Cloitre, 1996](#); [Kwako, Noll, Putnam, & Trickett, 2010](#)). Attachment theory holds that caregiver–child interactions shape the development of internal working models, or individuals' beliefs and expectations about self and other in close relationships, which in turn guide thought and behavior in later relationships ([Bowlby, 1969](#)). The failure of caregivers to provide consistent, sensitive, and responsive care during childhood is proposed to lead to greater insecurity in romantic relationships in adolescence and adulthood (e.g., [Collins & Sroufe, 1999](#); [Fraley & Shaver, 2000](#)). In adolescence, attachment style can be conceptualized along two orthogonal dimensions, anxiety and avoidance (see [Brennan, Clark, & Shaver, 1998](#); [Fraley & Waller, 1998](#)). The anxiety dimension is proposed to be particularly important for understanding sexual victimization in adolescent relationships. Adolescents who are high on attachment anxiety tend to be preoccupied with establishing and maintaining romantic relationships, but are uncertain about their partner's availability and interest and fear losing the relationship (e.g., [Fraley & Shaver, 2000](#)). Consequently, highly anxious females who strongly desire and are actively seeking intimate relationships may be more attentive to signals that a male likes them or is interested in them than to threats that the male may pose. Even if they do recognize potential danger, their fear of losing a close relationship may lead them to prioritize relationship preservation over self-protection.

The limited research examining links between attachment and victimization in adolescent relationships provides preliminary support for these ideas. [Grych and Kinsfogel \(2010\)](#) found that females expressing greater anxiety about romantic relationships reported experiencing higher levels of verbal and physical abuse from their partners and engaging in greater verbal and, marginally, greater physical abuse toward their partners (also see [Wolfe, Wekerle, Reitzel-Jaffe, & Lefebvre, 1998](#)). Although [Grych and Kinsfogel \(2010\)](#) did not assess sexual victimization, their findings suggest that females with anxious attachment styles may downplay self-protection in order to maintain close relationships. [Steinberg, Davila, and Fincham \(2006\)](#) also found that a measure of attachment was related to risky dating behavior in early adolescence, which included being coerced into engaging in sex, dating someone who was in a different relationship, and engaging in sexual behavior that did not include intercourse. Attachment was operationalized in terms of the valence of working models of self and other, and girls who reported more negative views of the “other” (reflecting more fearfulness and avoidance of intimacy) reported greater risky dating behavior, but their “self” model was not related to risky behavior. Although this conceptualization of attachment does not clearly map onto the dimensions of anxiety and avoidance, together these studies suggest that attachment style is relevant for understanding romantic or sexual relationships in adolescence.

Emotion decoding

Third, the ability to read emotional cues—including emotions expressed by others and the internal signals generated by one's emotional responses—is important for distinguishing dangerous and benign situations, and some victims of childhood abuse have difficulties accurately identifying their own emotional states and those of others ([Cicchetti & White, 1990](#); [Cloitre, Scarvalone, & Difede, 1997](#)). This may be a result of chronic overarousal of the stress response system, which we describe in more detail in the next section, or a failure by caregivers to help their children develop emotion regulation abilities. The same parenting behaviors that foster the

development of secure attachment also help children to learn how to label, manage, and express their emotions (e.g., [Bowlby, 1969](#)); consequently, the failure of many parents in abusive households to provide sensitive and responsive care also is likely to undermine the development of emotion regulation.

Alcohol and drug use

In addition to these individual characteristics, there may be situational factors that can affect females' ability to accurately read potentially dangerous interpersonal situations. Foremost among these is alcohol and drug use. Females who have experienced sexual abuse in childhood exhibit more problems with substance use in adolescence ([Arata, 2002](#); [Messman-Moore & Long, 2003](#)), and are more likely to associate with substance-using peers and to be in situations where intoxication and sexual activity occurs. Further, alcohol and drug use can impair the capacity to perceive threat and assess risk, and undermine judgment and decision-making.

The RRR model thus identifies factors that can interfere with the ability of sexually abused females to accurately assess potentially dangerous situations. Further, although recognizing threat is viewed as a *necessary* condition for engaging in effective behavioral responding, it is not *sufficient* for adaptive responding. In the next section, we describe how perceptions of threat may lead to maladaptive physiological reactions in females who have experienced sexual abuse.

React

The biological stress response system is proposed to play a central role in understanding how the recognition of sexual threat leads to effective resistance behavior. Perceiving the threat of imminent harm triggers a complex physiological reaction that increases arousal and motivates behavior intended to end the threat; that is, the "fight-or-flight" response. However, to be optimal such physiological arousal needs to be in a moderate or an adaptive range; overarousal could disrupt cognitive processing and problem-solving and may lead to freezing or other ineffective responses, and underarousal may fail to motivate resistance behavior. Emotions also are elicited by the perception of threat and serve to guide behavioral responding, but they are proposed to be dysregulated by maladaptive physiological reactions as well. The phenomenological aspects of physiological over- and underarousal are not well understood, but overarousal may be experienced as heightened anxiety or emotional flooding, whereas underarousal in the face of threat may be characterized by numbing or dissociation.

The biological stress response system involves multiple components, including the sympathetic and parasympathetic nervous systems, neurotransmitters, and the hypothalamic-pituitary-adrenal (HPA) axis (e.g., [DeBellis, 2001](#); [Watts-English et al., 2006](#)). It will be important to examine the relations among different aspects of the stress response system to fully understand their independent and interactive effects on behavior (see Implications for Research on Revictimization), but in the RRR model we focus primarily on the HPA axis because of the amount of empirical research supporting its role in regulating behavioral responses to stress and the impact of early stress on later HPA functioning. This work has documented a cascade of neurochemical events triggered by perception of a threat: the hypothalamus produces corticotrophin-releasing hormone (CRH), which stimulates the pituitary gland to release the ACTH, which in turn increases production of cortisol by the adrenal glands. Functionally, cortisol prepares the organism to respond to danger by providing a burst of energy, increased immune responses, and decreasing sensitivity to pain. After a period of elevation, cortisol inhibits HPA activity through a negative feedback loop that returns the individual to a homeostatic or baseline state. The HPA axis also serves to regulate other arousal systems, including the autonomic nervous system (ANS), that are instrumental in the fight-or-flight response to stress.

Dysregulated stress responses

Although this process fosters adaptive responses to threat, it can become disrupted. Human and animal research indicates that exposure to repeated or chronic stress can dysregulate HPA axis functioning such that the system remains in a state of hyperarousal rather than returning to baseline (e.g., [DeBellis, 2001](#); [van der Kolk, 2006](#); [Watts-English et al., 2006](#)). For example, children who experience severe abuse, neglect, or other forms of trauma exhibit elevated basal cortisol levels (e.g., [Cicchetti & Rogosch, 2001](#); [Delahanty, Nugent, Christopher, & Walsh, 2005](#)). If cortisol levels are chronically elevated, new stressors may lead to overreactive or unregulated reactions that disrupt memory, problem-solving, decision-making, emotion regulation, and coping behavior ([DeBellis, 2001](#); [Watts-English et al., 2006](#); [van der Kolk, 1989](#)). In fact, symptoms of physiological hyperarousal (as assessed on a self-report measure of PTSD symptoms) have been shown to predict revictimization ([Risser, Hetzel-Riggin, Thomsen, & McCanne, 2006](#)). Thus, the RRR model proposes that longstanding hyperarousal of the HPA axis increases females' vulnerability to sexual assault by interfering with cognitive, physiological, and emotional processes hypothesized to guide effective resistance behavior.

In contrast to the elevated cortisol levels seen in child victims of sexual abuse, adults who report being exposed to trauma or chronic stress in childhood exhibit *lower* levels of basal cortisol than those without an abuse history (for a meta-analysis, see [Miller, Chen, & Zhou, 2007](#)). This apparent discrepancy may be explained by the attenuation hypothesis, which proposes that HPA functioning is downregulated over time in order to protect brain structures such as the hippocampus and frontal lobe from adverse effects associated with prolonged exposure to cortisol ([Gunnar & Vazquez, 2001](#); [Susman, 2006](#)). However, this adaptation comes at a cost: hyporeactivity of the HPA system may leave individuals underresponsive to new threats. Thus, the RRR model proposes a second pathway by which childhood sexual abuse can lead to revictimization wherein individuals with diminished HPA axis functioning may lack the level of physiological arousal and activation needed to motivate assertive action or adequate coping responses.

[Trickett, Noll, Susman, Shenk, and Putnam \(2010\)](#) recently published the first long-term prospective study to empirically test the attenuation hypothesis in a sample of sexually abused females. Females who were victims of substantiated sexual abuse involving genital contact and/or penetration were recruited through child protective services agencies in the Washington, DC area. The 84 abused females were aged 6–16 and entered the study within six months of disclosure; they were matched with a sample of 102 females who were demographically similar but had no prior contact with protective services. The sample was assessed five times over the next 16 years and morning cortisol was assessed each time. Findings showed that abused group demonstrated higher basal cortisol shortly after disclosure relative to the comparison group but in adolescence did not differ from the control group on morning cortisol levels. However, when assessed in early adulthood (ages 18–32), the sexually abused females exhibited lower cortisol levels than controls, even after dynamically controlling for comorbid anxiety and depression—two conditions that are also associated with HPA variation. These findings support the hypothesis that dysregulation in HPA axis functioning plays a role in the elevated rates of sexual revictimization experienced by females with histories of childhood sexual abuse, and provide further impetus for the integration of stress responsivity into models of revictimization. These findings also underscore the complex nature of HPA disruption for victims of severe trauma. Consistent with the attenuation hypothesis ([Susman, 2006](#)) and with models of allostatic load ([McEwen & Wingfield, 2003](#)), depending on when the victimization occurred, either hyperarousal *or* hypoarousal may be manifesting; that is, hyperarousal might be observed in the acute phases of chronic stress disruption more proximal to severe trauma and hypoarousal might be observed after a prolonged period of hyperarousal as a characteristic of long-term recovery.

Respond

The final step of the model involves responding behaviorally to the threat. Verbal requests or attempts to redirect the aggressor may be sufficient in some cases, but more active and assertive behavior often is necessary

to resist persistent or escalating coercion. A number of strategies have been found to be more effective for repelling sexual assaults, including leaving the situation, calling for help, and pushing, hitting, kicking the assailant (e.g., [Amick & Calhoun, 1987](#); [Ullman, 2007](#)), although none will invariably stop an assailant who is more powerful than the victim. All of these actions require substantial physical energy and effort, and as described above, active, directed behavior is optimized by moderate levels of physiological arousal, whereas overarousal may result in overload and immobilization and underarousal may result in a diminished capacity to respond to threat.

As with accurately reading threat cues, an adaptive biological reaction is viewed as necessary but not sufficient for mobilizing resistance or escape behavior. Effective responses also depend on knowing what kinds of behaviors are likely to be successful. This information can be taught and often is included in date rape prevention programs, but not all programs developed for adolescents address this element ([Morrison, Hardison, Mathew, & O'Neil, 2004](#)). Consequently, adolescents may lack sufficient knowledge about how to ward off or react when faced with a potential assault. For example, they may fear that physical resistance will increase the risk that they will be injured, a concern that has not been borne out in research ([Rozee & Koss, 2001](#)). Other barriers to effective responding also may exist. For example, substance use may impair active resistance and concerns about the potential repercussions of calling attention to sexual aggression (e.g., damaging her relationship with the male, embarrassment, fear of being blamed) may lead to compliance, negotiation, or other attempts to stop the male that do not involve direct confrontation or attempting to escape ([Nurius et al., 2004](#)).

Studies utilizing standardized vignettes and retrospective self-reports of past assaults have not included measures of physiological arousal, and consequently no research has directly examined whether it is related to behavioral responses to sexual threats or coercion. However, research conducted by [Nurius and her colleagues \(2000, 2004\)](#) indicates that appraisals and emotional reactions were correlated with behaviors that women had engaged in to resist sexual assaults occurring in adolescence or adulthood. In one study, assertive responses (e.g., raising voice, hitting, running away) were predicted by greater anger and less concern about preserving the relationship, and diplomatic responses (e.g., making excuses, trying to redirect male) were correlated with greater sadness, less anger, and greater self-consciousness ([Nurius et al., 2000](#)). In another investigation, assertive responses were predicted by greater feelings of resentment (angry, annoyed, and disrespected), lower self-blame, and lower concern about the male's judgment, diplomatic responses were correlated with a range of factors, including greater resentment, self-blame and concern about the male's judgment, and immobilization was predicted by feelings of resentment, self-blame, and low levels of power ([Nurius et al., 2004](#)). Although there are limitations to the conclusions that can be drawn from retrospective data, this work illustrates the value of assessing females' emotional reactions and perceptions of the situation for understanding their behavioral responses.

Finally, sexual threats may be so distressing to some females that they attempt to suppress their physiological and affective arousal rather than trying to resist the aggressor. This may lead to dissociation or avoidant coping as a response to sexual aggression and result in ineffectual behavior ([Fortier et al., 2009](#)). It has been hypothesized that females who have been sexually abused are prone to dissociate in situations that evoke memories of the abuse (e.g., [Chu, 1992](#); [Cloitre, Scarvalone, & Difede, 1997](#)), and are at increased risk to develop PTSD (for a review, see [Messman-Moore & Long, 2003](#)). The data examining links between PTSD symptoms and responses to sexual threats are inconsistent, but no research has directly assessed the suppression of physiological arousal in the face of threat cues. Similarly, although there is some research linking avoidant coping styles to both child sexual abuse and revictimization (e.g., [DiPalma, 1994](#); [Futa, Nash, Hansen, Garbin, 2003](#); [Oaksford & Frude, 2003](#)), this research is based on self-report measures of coping rather than assessment of responses to specific incidents of sexual victimization. Consequently, it is not clear whether

sexually abused females are more likely to suppress their affective or physiological arousal in the moment, thus precluding active resistance to the sexual threat.

Summary

The RRR model argues that a comprehensive understanding of sexual revictimization requires attention to biological processes that influence victims' responses to sexual threat; further, it provides a mechanism for explaining why early sexual abuse increases females' vulnerability to later sexual assault. By integrating physiological factors with cognitive, affective and behavioral constructs, this model has the potential to synthesize existing theory in this area and make sense of inconsistencies in prior empirical findings. It also identifies new directions for investigating how childhood sexual abuse increases females' risk for revictimization.

Implications for Studying Revictimization

Need for new methodologies

Valid tests of the Read-React-Respond model hinge on the use of methods that can elicit physiological responses to sexual threats and assess their relations with perceptions of threat cues and coping behavior. However, the methods commonly used to study revictimization are unlikely to evoke a sufficient biological stress response. Written or audiotaped vignettes that present sexually coercive scenarios are useful for measuring participants' perceptions and behavioral intentions, but it is not clear that they assess how a person responds in a situation that evokes high levels of fear, distress, and physiological arousal. If physiological arousal affects responding as proposed in the RRR model, vignettes are unlikely to provide an externally valid measure of how females react to sexual threats. Similarly, whereas self-report measures are well-suited for measuring perceptions and appraisals of stressful situations, they are very limited in their capacity to assess physiological reactions in those situations.

The need for new paradigms that can elicit physiological arousal must be balanced with ethical concerns about their potential impact on participants. [Jouriles and his colleagues \(2009\)](#) recently developed a procedure for use in date rape prevention programs that is highly engaging but presents no physical danger to participants. Concerned that the standard role-playing procedures used in these programs are not realistic enough for participants to learn how to respond to sexual pressure under stress, [Jouriles et al. \(2009, 2010\)](#) used virtual reality (VR) technology to create a more life-like context for teaching resistance behavior. The VR procedure was pilot-tested with a sample of college-aged women, and females who took part in the VR procedure found it to be more realistic and emotionally engaging than a group of students who participated in a standard role play scenario with a live actor. VR is beginning to be used in mental health settings (e.g., to treat phobias), and could provide a methodology for assessing females' cognitive, physiological, and behavioral responses to sexually threatening situations in an ethically sound manner.

Timing and interactions among biological processes

The complexity of the biological stress response requires attention to a number of important issues. First, it is possible that both hyper- and hypo-arousal of the HPA axis might be at play in vulnerabilities to revictimization. Sensitive assessment of victimization histories will aid in the ability to more accurately articulate the extent and character of HPA disruption over time. Second, the biological stress response involves multiple systems (e.g., HPA axis, ANS, neurotransmitters), but there is little understanding of how they jointly shape adaptive responding. A model proposed by [Bauer and colleagues \(2002\)](#) posits an interactive synergy between stress response systems that should function in concert to produce optimal responses to novel or threatening conditions. The model also raises the possibility that activation can occur in one system while simultaneously being understimulated or blunted in another. Such asymmetry in stress response patterns may result in global impairment, thereby limiting resources to effectively cope with the demands of a stress or threat. Although

exposure to childhood maltreatment has been shown to be related to ANS disruption ([Heim et al., 2000](#)) and marked ANS/HPA asymmetry ([Shenk, Noll, Putnam, & Trickett, 2010](#)), and both ANS and HPA axis functioning have been linked to various forms of psychopathology ([Pajer, Gardner, Rubin, Perel, & Neal, 2001](#); [Sack, Hopper, & Lamprecht, 2004](#); [Shenk et al., 2010](#)), disruption across multiple systems has not yet been integrated into models of victimization.

Role of PTSD

Another important direction for understanding the biological contribution to revictimization involves the relations among sexual abuse, PTSD, and sexual victimization. The physiological processes proposed to underlie adaptive and maladaptive responses to sexual threats are similar to those implicated in PTSD (e.g., [DeBellis, 2001](#); [van der Kolk, 2006](#)), and it will be important to explore the extent to which they overlap or are distinct. Research examining links between PTSD symptoms and revictimization have produced inconsistent results; although PTSD appears to be a risk factor for later assault, its associations with perceptions of threat and responses in specific situations has not been established (see [Arata, 2002](#); [Messman-Moore & Long, 2003](#)). Relatedly, given that HPA axis regulation can be affected by a range of stressful and traumatic experiences, the Read-React-Respond model suggests that other kinds of experience with abuse or violence, including physical child abuse and exposure to family violence, might also increase risk for revictimization. Consequently, a comprehensive understanding of the implications of early stressful experiences for later sexual victimization may require a wider perspective that includes traumatic responding to events beyond sexual abuse.

Implications for Prevention of Revictimization

The RRR model also has implications for programs developed to prevent sexual victimization. Existing date rape programs typically present information about how to respond effectively to sexual threats and sensitize participants to behavior that may be coercive. This is important information, but information alone is not likely to be enough to prevent sexual victimization, especially in females at higher risk due to sexual abuse. It may be necessary for participants to understand how they respond to stress at a physiological level and to learn how to manage their affect and arousal in the face of potential sexual threats. [Cloitre \(1996\)](#) has described an approach for treating women who have been revictimized that incorporates a focus on emotional and interpersonal regulation with prolonged exposure (PE) treatment, originally developed by Foa and colleagues for PTSD ([Foa, Rothbaum, Riggs, & Murdock, 1991](#)). Specifically, it is designed to help women learn how to identify and label feelings, tolerate and manage negative affect, and negotiate difficult interpersonal situations.

Psychopharmacological treatments recommended for victims of PTSD also may be worth exploring, and [Kendall-Tackett \(2009\)](#) recently suggested that long-chain omega-3 fatty acids, exercise, and sleep interventions may influence the physiological processes proposed to underlie sexually abused females' reactions to sexual threat, and therefore, may be useful adjuncts for more traditional therapeutic approaches to treating PTSD.

The Virtual Reality paradigm developed by [Jouriles and colleagues \(2009\)](#) also has potential for use in prevention programs. It can give females the opportunity to learn regulatory strategies in an affectively arousing situation without exposing them to any risk of assault. Similarly, gaining insight into the needs and goals that may lead females to downplay or dismiss possible threats may enable them to better understand what situations may be particularly risky for them and to develop more adaptive ways to meet some of these needs. The equipment needed for the procedure is costly, but as technological advances in virtual reality continue, it may become increasingly feasible for both school- and community-based prevention.

Victimization programs for adolescents have been criticized for lacking developmental sensitivity because they are derived from programs initially designed for college-aged women (e.g., [Foshee et al., 2004](#)) and many of the relapse-prevention strategies lack evidence of generalizability ([Morrison, 2004](#)). Despite the substantial incidence rates of adolescent violence, adolescence largely has been ignored in terms of its dynamic importance

for establishing patterns of healthy, nonviolent relationships, and for acquiring tools for self-protection ([Jaffe, Suderman, Reitzel, & Killip, 1992](#)). From a developmental perspective, the beginning of puberty is an ideal time for prevention programs because teens at this stage are (a) developing important physiological, cognitive, and social sophistication; (b) beginning to develop social scripts for sexual conduct; (c) increasingly subjected to peer pressure and to sensationalized depictions of sexual relations in the popular media that normalize coercive attitudes and behaviors; and (d) experiencing the onset of dating and sexual behavior. Adolescence also is a critical point for prevention because individuals who report abuse in early dating relationships are more likely to reexperience abuse with future dating and marital partners ([Feiring & Furman, 2000](#)).

Current prevention programs for adolescents also do very little to address critical comorbid conditions that might preclude efficacy. Programs designed for maltreated youth (e.g., [Wolfe et al., 2003](#)) focus on education and awareness, skill development and community services, but have lacked attention to mechanisms known to be linked to adolescent revictimization (such as alcohol and drug use and risky sexual behaviors) and are designed to target only peer dating violence, which constitutes only a small proportion of the revictimization experiences of females with histories of childhood abuse ([Barnes et al., 2009](#)).

Conclusion

Considerable progress has been made in documenting the vulnerability of sexually abused females to later victimization in adolescence and adulthood, and in identifying some of the factors that contribute to adaptive and maladaptive responses to sexual threats. However, efforts to more fully understand these processes have been limited by a lack of attention to the biological processes underlying the human stress response. The RRR model offers a more comprehensive and cohesive framework of revictimization that integrates biological, cognitive, affective, and behavioral processes and provides a mechanism for understanding how early experiences of sexual abuse increase females' risk for revictimization. This model identifies new directions for the empirical study of revictimization and for the design of programs intended to prevent sexual assaults in adolescence and adulthood.

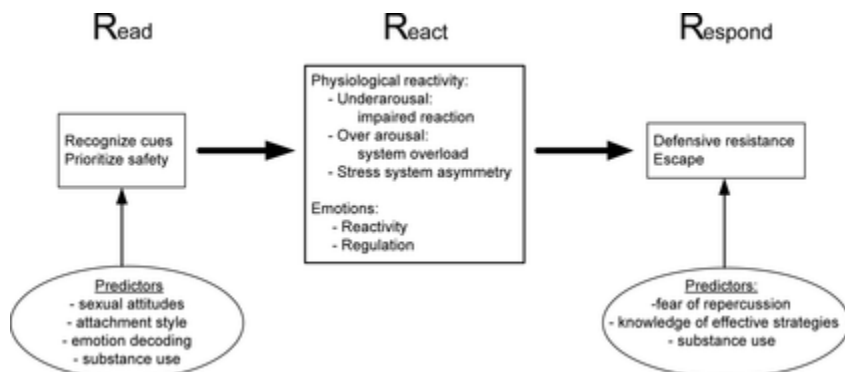


Figure 1. The Read-React-Respond model.

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