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Is Good Sex Good for You? Rethinking Sexuality and Health

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Abstract

Despite the central importance of sexuality to human well-being, the study of sexuality remains marginalized within health psychology, which hampers the ability of clinicians and policy-makers to promote comprehensive health and well-being. In this review we discuss the evidence that sexual functioning makes critical contributions to human health, focusing specifically on findings linking sexual activity to morbidity and mortality, to the health-promoting effects of intimate relationships, and to processes of emotion regulation. We argue that researchers studying the psychology of health and well-being should more substantively integrate sexuality into their research agendas. Health psychologists' specific expertise in investigating and interpreting complex, reciprocal associations between subjective emotional states, health-relevant cognitions, and health-relevant behavior can make a notable contribution to elucidating some of the most intriguing correlations between sexuality and health that have emerged from medical and epidemiological studies. If we want to foster optimum physical and mental health among youths and adults, we must rigorously investigate the multiple mechanisms through which positive sexual functioning plays a unique and fundamental role in human well-being across the life course.

Excerpts from David Satcher's Groundbreaking "Call to Action" on Sexual Health in 2001

> Sexuality is an integral part of human life. It carries the awesome potential to create new life. It can foster intimacy and bonding as well as shared pleasure in our relationships. It fulfills a number of personal and social needs, and we value the sexual part of our being for the pleasures and benefits it affords us.... Sexual health is inextricably bound to both physical and mental health (Satcher, 2001, p. 1).

Despite this groundbreaking statement by (then) Surgeon General David Satcher asserting the central importance of sexuality to human well-being, researchers studying mental and physical health over the lifespan generally have *not* included a substantive focus on sexuality. Rather, studies of sexuality and health are usually confined to the study of sexually transmitted infections, unplanned pregnancies, and sexual assault/abuse. Over the years, scholars within various subdisciplines of psychology (especially developmental, clinical, and social psychology) have echoed Satcher's call for a paradigm shift, arguing for greater study of the positive, normative, and pleasurable dimensions of sexual functioning, rather than an exclusive focus on sexual risks and problems (e.g., Russell, 2005).

Yet this paradigm shift has not taken place, and the study of sexuality remains marginalized within health psychology. This marginalization hampers the ability of clinicians and policy-makers to promote comprehensive health and well-being. If researchers studied the health-relevant sequelae of sexuality with the same rigor that they apply to exercise, diet, and alcohol use, we might be in a position to make more nuanced and effective

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recommendations about sexual health. For example, we now appreciate that alcohol consumption decreases the risk for certain diseases and increases the risks for others, depending on the individual and amount. This has allowed health professionals to make tailored recommendations to specific individuals (e.g., men at risk for heart disease seem to benefit from one to two drinks daily, whereas women with a family history of certain types of cancers might do well to restrict their alcohol consumption).

Presently, health-related messaging on sexuality defaults to a ''less is better'' approach. In other words, because sex carries risks, the best way to minimize these risks is to minimize sex. Adolescents should remain abstinent. Young adults should delay sexual initiation as long as possible, use condoms, and confine their sexual behavior to monogamous pairings. If these long-term monogamous pairings eventually experience dramatic declines in sexual activity, it is only viewed as a ''problem'' if the individuals themselves define it as such. Certainly, no public health outcry has ever been raised over the mental and physical health implications of population-level sexual boredom.

We are not arguing against health-promoting recommendations that strive to reduce the risks associated with sexual behavior (i.e., condom use *can* save lives). Our concern is with the default (and implicitly moralistic) presumption that the only health-relevant aspect of sexuality concerns its potential for risk. What if, instead, we took more seriously the potential for regular, positive sexual functioning to confer health *benefits*? How might our health recommendations change if we sought the answers to questions such as: What is the best age at which to initiate sexual activity? What is the ideal level of weekly sexual activity to pursue for optimal health? Are certain sexual activities healthier than others? What are the health consequences of prolonged periods of abstinence during adulthood? If researchers did, in fact, determine that a satisfying sexual life confers some protection against individual morbidity and mortality, this would necessitate a profound shift in the default, ''less is better'' approach which currently characterizes public health messaging around sexual health. Instead we would have to determine how individuals can best *balance* the risks and benefits of sexual contact in the service of optimal psychological and physical well-being.

This shift is unlikely to occur without a commitment from researchers across substantive areas to begin to appreciate the fundamental role that sexuality plays in human experience, and to begin to integrate sexuality into their ongoing work. Toward this end, in this review we will first discuss the evidence that sexual functioning makes critical contributions to human health and well-being, focusing specifically on findings linking sexual activity to morbidity and mortality. We argue for greater attention by psychologists to the questions of mechanism and context which are critical for establishing the specific role of sexual activity in mental health and physical well-being. As illustrations, we discuss the role sexual behavior might play in understanding the health-promoting effects of intimate relationships, and in processes of emotion regulation. Our goal is to prompt fellow researchers studying the psychology of health and well-being in any substantive area to take up the challenge of integrating sexuality into their research agendas.

Is a Healthy Sex Life Important for Physical Health?

Eighty years ago, biologist Raymond Pearl, a pioneer in studying the influence of lifestyle factors on health, noted the lack of empirical data on how sexuality relates to longevity (Pearl, 1931). Since Pearl's provocative commentary, only a handful of studies have followed up on the question of whether sexual behavior is related to morbidity or mortality, beyond the obvious negative consequences of Human Immunodeficiency Virus (HIV)

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and STDs. Of course, the attention paid to these negative consequences is warranted, given their tremendous economic and public health implications. Estimates suggest that 30% of our U.S. healthcare costs are, in some way, related to sexuality (Elders, 2010), and HIV remains the 6th leading cause of death worldwide (World Health Organization, 2008). Yet in sharp contrast to the rigorous documentation of these risks, we know very little about the health *benefits* of regular, satisfying sexual activity (beyond simple replacement of the species).

Is there, in fact, empirical evidence that sex is good for us? Although no randomized, controlled clinical trials have been conducted on this question, large-scale observational research emphatically suggests that individuals who engage in regular sexual activity have better health (e.g., Lindau & Gavrilova, 2010). Of course, these correlational studies cannot identify the direction of causality, and the most common interpretation is that poor health leads to less sexual activity (ostensibly because individuals in poor health have less interest in and capacity for sexual behavior). However, a handful of longitudinal cohort studies suggest that there is also a causal pathway running *from* sex *to* health. Persson (1981) followed 219 married Swedish men and women from age 70 to 75. Univariate analyses revealed that the men (but notably, not the women) who reported ''ongoing'' sexual activity at age 70 were less likely to die during the ensuing 5 years. In a similar investigation, the Duke Longevity study followed 270 older individuals (median age 70) until death, and found greater longevity among men with more frequent sexual activity (Palmore, 1982). Among women, greater *enjoyment* of sexual activity predicted longevity, even after controlling for numerous health-related covariates. Together these two early studies suggested that sexual activity promotes health and well-being for both men and women, although potentially for different reasons.

More recently, two large studies with long follow-up periods have yielded even more compelling evidence for the health-promoting qualities of sexual behavior. In the Caerphilly Study, nearly 3000 Welsh men between the ages of 45 and 59 received detailed physical and psychosocial evaluations over the course of 10 years (Davey Smith, 1997). Men who reported a greater frequency of orgasm at baseline had a lower all-cause mortality over the 10-year followup. Adding further support for a possible causal link, the association between orgasmic frequency and death showed a dose-response relationship (i.e., more frequent orgasms were linearly related to lower mortality), and the effects persisted after controlling for a host of health-relevant covariates assessed both via self-report and through physical exam. Finally, Chen, Tsend, Wu, Lee, and Chen (2007) reported findings from a 14-year prospective study of over 2000 Taiwanese individuals over the age of 65. Being sexually active at baseline was negatively associated with all-cause mortality over the next 14 years for both men and women. Controlling for most possible confounds diminished the effect somewhat for women, but not for men. Additionally, men who reported ongoing interest in sexual activity (independent of behavior) also showed lower mortality, controlling for potential confounds. Thus, the existing epidemiological literature points to the possibility that sexual behavior may be protective for long-term health, suggesting that the default ''less is better'' approach to sexuality might *itself* be risky!

Importantly, however, links between sexual activity and overall mortality must accumulate because of associations between sexuality and disease (or lack thereof). A number of studies have explored links between sexual activity and morbidity within specific patient populations, such as those with cardiovascular disease (Brody & Preut, 2003; Goldstein, 2000; Muller, 1999), prostate cancer (Dennis & Dawson, 2002; Giles et al., 2003; Leitzmann, Platz, Stampfer, Willett, & Giovannucci, 2004; Lightfoot et al., 2004;

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Rosenblatt, Wicklund, & Stanford, 2001), and breast cancer (Gjorgov, 1978; Le, Bachelot, & Hill, 1989; Rossing, Stanford, Weiss, & Daling, 1996). In these populations, sexual activity appears to confer *both* risks and benefits. For example, men with a history of sexually transmitted infections have greater risk of developing prostate cancer (Dennis & Dawson, 2002), but men with a greater overall ejaculation frequency over the lifespan appear to have lower risks (Giles et al., 2003; Leitzmann et al., 2004). Similarly, sexual activity confers both risks and benefits with respect to cardiovascular disease: For some men with heightened cardiovascular risk factors, the exertion of sexual intercourse might contribute to an acute cardiovascular event (Muller, 1999; Thorson, 2003), but studies also suggest that sexual activity is directly related to better overall cardiovascular health (Brody & Preut, 2003; Brody, Veit, & Rau, 2000).

The literature connecting sexual activity to morbidity and mortality offers at least two broad lessons for psychologists. The first lesson is that sexual activity is, in fact, a *bona fide* health behavior with wide-ranging implications for mental and physical well-being. The complex constellation of risks and benefits associated with sexual activity, and the many factors which potentially moderate its risk-benefit ratio for different populations, require the same substantive research attention that is routinely devoted to smoking, exercise, and diet. The second lesson is that this area of research *needs* greater involvement by psychologists. Our absence from this area of inquiry has left tremendous gaps in the literature. As behavioral scientists, psychologists are uniquely qualified to begin untangling questions of mechanism and causation that remain unaddressed by large-scale epidemiological surveys.

For example, psychologists have much to contribute in the domain of basic assessment: Currently, studies of the health correlates of sexual behavior rely on grossly inadequate assessments of sexual behavior, such as one or two-item measures (typically, ''Are you currently sexually active?''). As a result, studies are often unable to distinguish between the possible health effects of different kinds of sexual activities and in different contexts. Does masturbation have the same health correlates as penile-vaginal intercourse or oral sex? Are there different health implications of engaging in a particular activity with a primary partner versus a casual partner? Or with one partner versus many partners? What about the interpersonal context of sexual behavior? An increasing body of research has focused on the phenomenon of *unwanted but consensual* sexual contact in couples, in which one partner ''goes along'' with sex, despite not wanting it, in order to satisfy the partner's needs, promote intimacy, or avoid tension (O'Sullivan & Allgeier, 1998; Vannier & O'Sullivan, 2010). Does sexual behavior pursued under these circumstances convey the same health benefits as sexual behavior that is pursued more enthusiastically? Answering such questions is critical for our ability to develop and test theories regarding the specific behavioral mechanisms through which sexual activity is linked to different health outcomes. For example, if masturbation without a partner is associated with the same health outcomes as partnered sexual contact, then this would provide important evidence against the possibility that the health benefits of sexual contact are attributable to psychosocial factors such as increased intimacy. Thus, in order to answer such questions, we need better and more comprehensive assessment of sexual behavior *and the diverse social and interpersonal contexts in which it occurs*. This is an area in which psychologists' considerable expertise can make important contributions.

Greater attention to context is also important for ruling out potential confounds which might account for the link between sexual activity and health, as well as potential moderators of this link. After all, sexual behavior is highly correlated with a variety of other biological, psychological, and social phenomenon that have direct health consequences

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(involvement in a relationship, educational status, substance use, etc.). Therefore, it is essential that we anticipate, assess, and account for such factors when evaluating associations between sexual activity and health. This requires thinking holistically about sexual behavior and remaining mindful of the total biopsychosocial context in which it occurs. Lastly, psychologists are particularly well-qualified to wrestle with questions of mechanism. Most of the mechanisms that have been proposed in the medical and epidemiological literature as explanations for links between sexual activity and health are strictly biological (for example, the notion that ejaculation might reduce the risk for prostate cancer by facilitating the evacuation of certain toxins that build up in the prostate). While these biological explanations are worthy of study, and may account for some of the association between sexual activity and health, they fail to capture the myriad of other health-relevant social and emotional processes that co-occur with sexual activity, and which psychologists are better equipped to identify and assess.

Perhaps the most prominent health-relevant context for sexual activity is that of an intimate relationship. After all, one of the most robust findings to emerge from health psychology over the past 30 years is that individuals in enduring, committed romantic relationships have longer, healthier, and happier lives than unmarried individuals (Cheung, 1998; Horwitz, McLaughlin, & White, 1998; Mastekaasa, 1994; Murphy, Glaser, & Grundy, 1997; Ross, 1995; Ryff, Singer, Wing, & Love, 2001; Stack, 1998; Stack & Eshleman, 1998). How then, might an appreciation of sexuality enhance our understanding of this phenomenon? A number of possibilities exist. First, consider the fact that most sexual activity in Western industrialized countries (approximately 90%) takes place within established romantic relationships (Gagnon, Giami, Michaels, & Colomby, 2001; Laumann, Gagnon, Michael, & Michaels, 1994; Waite, Laumann, Das, & Schumm, 2009; Willets, Sprecher, & Beck, 2004). This of course makes it challenging to disentangle the health benefits of close relationships from the health benefits of sexual activity. After all, if sexual activity simply functions as a marker for involvement in an ongoing healthy relationship, then associations between sexual activity and health might be spurious. Yet an alternative, provocative possibility is that some of the widely appreciated associations between close relationships and health are actually attributable (at least in part) to sexual activity. If this is the case, then ''sexless'' marriages might actually *fail* to show health benefits. Testing these alternative possibilities would greatly enhance our ability to pinpoint the mechanisms through which sexual activity is linked to health.

A second way in which an appreciation of sexuality would enhance our understanding of relationships and health concerns the very fact of their confounding. Sexual activity, relationship involvement, and health are linked through multiple complex, causal, and likely reciprocal paths. Hence, failing to integrate sexual activity into relationship research is like trying to understand the health benefits of exercise while ignoring what the exercisers happen to be eating. In the section that follows we propose just a few possible, provocative causal links between relationships, sexuality, and health, in an effort to illustrate how relationship researchers would benefit from a more thorough and systematic assessment and analysis of sexual behavior.

Does Sex Contribute to the Health Benefits of Close Relationships?

Although the health benefits associated with long-term intimate relationships have been widely documented, the unique *physical* intimacy characterizing such relationships has received little substantive attention. Yet in light of the emergent associations between sexual activity and long-term health, reviewed above, we think it possible that regular,

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positive sexual interactions in long-term couples may prove to be one of the mechanisms through which such relationships have long-term health promoting effects.

Extensive research demonstrates links between the quality of a couple's sex life and their overall relationship quality, but many of these studies are rather general in nature, and cannot speak to the mechanisms underlying this association. The direction of causal association is also unclear. For example, several longitudinal studies have found that sexual satisfaction, and in particular, declines in sexual satisfaction, uniquely predict relationship dissolution over time (Edwards & Booth, 1994; Oggins, Leber, & Veroff, 1993; Sprecher, 2002; Veroff, Douvan, & Hatchett, 1995), and this link appears to be attributable to the robust, reciprocal association between the quality of a couple's sex life and the quality of their overall relationship (Yeh, Lorenz, Wickrama, Conger, & Elder, 2006). Also, studies of romantic breakups have found that individuals frequently list sexual problems and sexual incompatibility as key contributors to their breakup (Kurdek, 1991; Sprecher, 1994). Hence, the quality of a couple's sexual life appears to make a unique contribution to the quality and potential longevity of their relationship.

Yet what is the specific nature of this contribution, and how might it relate specifically to the *health* implications of these relationships? Thus far, extant research on the physical health benefits of well-functioning relationships has focused predominantly on the social and emotional support provided by such relationships, which is known to down-regulate a range of physiological processes directly linked to physical health, such as cardiovascular, neuroendocrine, and immune functioning (Uchino, 2006). Hundreds of studies over the past several decades have attempted to capture these processes "in action," in order to identify *which* types of day-to-day interactions between couples appear to have the largest, most immediate, and/or most lasting consequences for different biobehavioral processes. To provide just a few examples, studies have examined how different types of interactions between partners influence cardiovascular functioning (Brown, Smith, & Benjamin, 1998; Holt-Lunstad, Birmingham, & Light, 2008; Smith et al., 2010), neuroendocrine activity (Grewen, Girdler, Amico, & Light, 2005; Powers, Pietromonaco, Gunlicks, & Sayer, 2006), and immunological responses (Kiecolt-Glaser, Malarkey, Chee, & Newton, 1993; Mayne, O'Leary, McCrady, & Contrada, 1997; Miller, Dopp, Myers, Stevens, & Fahey, 1999). The level of detail in these studies is impressive: Couples' interaction quality is typically assessed for highly specific features, such as contempt, hostility, warmth, humor, criticism, withdrawal, and repair, and usually across multiple contexts (within the lab and out, across multiple days within the couples' home environment, over the course of many years, and from the perspective of both partners).

Sex as a form of support within relationships

One of the paradoxes that has emerged from this line of research is that although global perceptions of support availability are reliably linked to health-related outcomes (Collins & Feeney, 2000; Reis, Clark, & Holmes, 2004; Srivastava, McGonigal, Richards, Butler, & Gross, 2006), the process of *actually receiving* concrete, observable acts of support is not always beneficial, a finding that has been attributed to the multiple contextual factors which shape how support receipt is experienced and interpreted. For example, when clear-cut acts of support are interpreted by the support recipient as implying that he/she is incompetent or needful they can inadvertently reinforce his/her feelings of stress or weakness and lead to negative psychological outcomes (Bolger & Amarel, 2007; Bolger, Zuckerman, & Kessler, 2000; Gleason, Iida, Shrout, & Bolger, 2008; Shrout, Herman, & Bolger, 2006). Yet this is not the case when support provision is highly responsive and

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nurturant, making the support recipient feel cared for, understood, and valued, and actively facilitating improvement (Maisel & Gable, 2009; Overall, Fletcher, & Simpson, 2010). In these cases, receiving support is beneficial.

This research echoes the findings of other studies which have demonstrated that an overall climate of positivity, playfulness, and responsiveness in a relationship facilitates adaptive responses to everyday relationship stressors, making it easier to ''ride out'' periods of strain, and also feeding forward to promote continued positive interpersonal *and* overall psychosocial development (Gable & La Guardia, 2007; Gable, Reis, Impett, & Asher, 2004; Gottman, 1994; Gottman & Levenson, 2000). Collectively, these studies indicate that positive behaviors between partners provide the ''bricks and mortar'' of a well-functioning, *health-promoting* relationship. The beneficial effects of any one of these behaviors might not be immediately observable, but over the course of a long relationship, they weave a fabric of connectedness, trust, mutual support, and enjoyment between partners that fuels adaptive, health-promoting interpersonal and physiological processes. Positive sexual interactions are arguably the single most important mechanism through which couples can establish such a health-promoting climate within their relationship. And yet sexual behavior has somehow escaped the comprehensive scrutiny and methodological rigor that has accompanied research on *other* positive couple behaviors, such as providing social support (reviewed above), accommodating one another's weaknesses and forgiving transgressions (Arriaga & Rusbult, 1998; Fincham, 2000; Fincham, Hall, & Beach, 2006; Rusbult, Bissonnette, Arriaga, Cox, & Bradbury, 1998), capitalizating on one another's positive moods and experiences (Arriaga & Rusbult, 1998; Gable, Gonzaga, & Strachman, 2006; Gottman, 1993; Gottman & Levenson, 1992; Hicks & Diamond, 2008; Rusbult et al., 1998), and maintaining ''positive illusions'' about one another's motives and traits (Conley, Roesch, Peplau, & Gold, 2009; Murray, Holmes, & Griffin, 1996, 2003). Most of the studies that have comprehensively assessed these domains report *no information* on couples' sexual functioning. When they do, the information is fairly sparse, typically comprised of (1) how often the couple engages in sexual activity, and (2) how generally satisfied they are with their sex life (reviewed in Sprecher & Cate, 2004). The widespread use of such brief and broad measurement strategies is rather striking, given that a substantially greater level of depth and detail has been considered necessary to reliably assess myriad *other* health-relevant features of a couple's life, such as their conflict style, division of household labor, and modes of giving and receiving support (reviewed in Diamond, Fagundes, & Butterworth, 2010).

Yet as shown above, there is substantial evidence that establishing a climate of positivity and responsive support in a relationship provides a powerful buffer against stress, and may play a critical role in establishing and maintaining health-relevant interpersonal and physiological processes. Satisfying sexual contact might be among the fastest, most reliable, and most effective routes to achieving and maintaining such a health-promoting climate. When partners regularly set aside time to exchange intense physical pleasure in a climate of warmth, excitement, playfulness, mutuality, and positive regard, this arguably provides one of the best possible manifestations of ''support'' ''capitalization,'' *and* ''positive illusions,'' wrapped into one. Positive sexual interactions might also help to ''compensate'' for deficits in other domains: For example, Litzinger and Gordon (2005) found that sexual satisfaction uniquely predicted overall marital satisfaction *only* in couples characterized by poor communication, which may suggest that for couples who may face difficulties with day-to-day communications of love, affection, and support, sexual intimacy may provide an alternative route to doing so. Studies have also found that frequent sexual behavior buffers partners against the detrimental implications of a partner's negative traits.

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Couples containing a partner with high neuroticism or high attachment insecurity tend to have lower relationship satisfaction, but this association is significant attenuated among couples who report engaging in highly frequent sexual activity (Little, McNulty, & Russell, 2010; Russell & MacNulty, 2011).

Of course, not all sexual interactions are alike: It is a reasonable and testable hypothesis that couples' sexual interactions need to involve high levels of *mutual* satisfaction, trust, intimacy, and positive regard in order to confer these benefits. To the degree that one partner feels ''underbenefited'' (i.e., that they are contributing more to their partner's satisfaction than their partner is contributing to their satisfaction, see Byers & Wang, 2004), regular sexual activity might not have these beneficial effects, and might instead reinforce problematic dynamics in the relationship. This possibility is supported by research showing that other relationship processes which would appear to be uniformly beneficial, such as forgiveness and positive relationship expectations, also have ''down sides'' in certain contexts (McNulty, 2010). For example, forgiveness may erode an individual's self-respect and lead to continued transgressions if the partner who was forgiven feels free to offend again, and does not actively demonstrate care and value to the partner (Luchies, Finkel, McNulty, & Kumashiro, 2010; McNulty, 2008). Positive relationship expectations and cognitions are associated with improvements in marital quality for couples with low levels of marital problems, but among more distressed couples they can prevent couples from addressing and resolving problems, exacerbating distress over the long term (McNulty, 2010). Hence *all* meaningful interpersonal processes in close relationships must be interpreted with regard to the specific situational and affective context in which they occur, the manner in which they are enacted, and how they are appraised and interpreted by both partners, both immediately and over time. Sexual activity is no different, and requires the same nuanced approach. The aforementioned health benefits associated with sexual activity are unlikely to occur when couples pursue sexual activity as a means of avoiding verbal intimacy, asserting power or control over one another, or reluctantly showing submission and/or appeasement. These complications underscore why it is necessary to assess far more information about a couple's sexual activity than simply its overall frequency and global quality. Just as comprehensive analyses of couples day-by-day and moment-by-moment behavior have proven relevant to understanding processes of support, conflict resolution, and capitalization, we would argue that they are equally relevant to understanding the role of positive sexual exchanges in fostering and sustaining health-relevant biobehavioral processes within long-term intimate ties.

Such information might be particularly useful in helping to elucidate the mechanisms underlying gender differences in the links between relationships and health. Numerous studies have found that marital status appears to have a more health-protective effect on men than on women over the lifespan (see the comprehensive review by Kiecolt-Glaser & Newton, 2001). Women, it seems, appear especially sensitive to the cumulative ''downsides'' of long-term marriages (conflict, hostility, etc.) whereas men appear especially sensitive to their benefits (support, companionship, etc.). Numerous factors may contribute to this pattern of results. As reviewed by Kiecolt-Glaser and Newton (2001), women are typically socialized to maintain a relational, interdependent sense of self that prioritizes the maintenance of close social ties (Acitelli & Young, 1996). Accordingly, women may be more vigilant in monitoring their relationships for conflicts and problems, and may interpret such conflicts and problems as more threatening. Women also may experience greater day-to-day stress than their husbands because of their disproportionate responsibility for child care and household labor (Hochschild & Machung, 2003), and

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over the years as these stressors accumulate, they may counterbalance some of the health-related benefits of marital support.

How might the well-documented gender differences in couples' sexual interactions contribute to these dynamics? Research on heterosexual couples, for example, has found that men tend to initiate sexual activity more frequently than women do (Byers & Heinlein, 1989; Laumann et al., 1994) and men report wanting more frequent and varied sexual activities (Purnine & Carey, 1998; Richters, Grulich, Visser, Smith, & Rissel, 2003; Simms & Byers, 2009). Although some would argue that these reflect biologically based differences in sex drive (Baumeister, Catanese, & Vohs, 2001), they also reflect the fact that women receive persistent messages from parents, schools, and the media suggesting that women are less interested in sex than men, and that their role is to be the sexual "gatekeeper" in a relationship (Aubrey, 2004; Farvid & Braun, 2006; Fine, 1988; Tiefer, 2004; Tolman, 2002; Tolman & Diamond, 2001). Yet notably, some research indicates that women do not want *less* sexual activity than their male partners, but different *types* of sexual activity: specifically, although both men and women rate foreplay as an important part of the sexual interaction (Miller & Byers, 2004; Mulhall, King, Glina, & Hvidsten, 2008), women report wanting more foreplay than men, and (perhaps more importantly) more foreplay than they are actually having (Witting et al., 2008). Yet women appear to have more difficulty than men in advocating for changes to the sexual script: studies of sexual communication have found that although women engage in more explicit negotiation about sexual practices than do men, they appear to be less effective than men in these negotiations, and less confident about their ability to influence their partners (Greene & Faulkner, 2005). Similarly, studies examining discrepancies between male and female partners in sexual motivation have found that women are more likely to "go along" with unwanted sexual activity than men (Impett & Peplau, 2002; O'Sullivan & Allgeier, 1998), often to maintain a sense of intimacy with their partner and to avoid tension and conflict. These findings suggest that over time, women in long-term marriages might experience fewer of the positive psychological benefits associated with sexual activity, and might actually experience chronic levels of stress if they feel unsatisfied and underbenefited. Future research should closely examine whether such experiences might make a unique contribution to gender differences in the health benefits of marriage.

Future Directions: What Makes Sex Healthy?

A key question underlying all of the research reviewed above is "what's the mechanism?" If sex is beneficial, *why* is it beneficial? In the foregoing review, we have chosen to focus on one of the most obvious (and disturbingly understudied) domains for future study: The intersection between sexuality, close relationships, and health. Yet there are undoubtedly other domains ripe for exploration, in which different mechanisms might be at play. One particularly intriguing possibility concerns emotion regulation and stress reduction. Research has documented a cascade of neuroendocrine and autonomic changes associated with both partnered (Brody & Kruger, 2006; Exton et al., 1999, 2001; Kruger, Haake, Hartmann, Schedlowski, & Exton, 2002) and solitary sexual activity (Brody & Kruger, 2006; Kruger et al., 1998; Kruger et al., 2002), most notably a pronounced increase in prolactin after orgasm, which may be specifically implicated in feelings of satiety (Brody, 2003), and which reflect inhibitory central dopaminergic processes. Despite these well-documented effects, we know little about the potential for sexual behavior to serve as a tool for proactively regulating emotional states and specifically alleviating stress and anxiety. Studies of rodents show direct stress-reduction effects of pleasurable activities

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(specifically, food and sex) via activation of the brain's fundamental reward circuitry (Ulrich-Lai et al., 2011). If this were also true for humans, we might expect to see evidence that some individuals pursue sexual activity for the purposes of stress dampening and emotion regulation (albeit perhaps not consciously).

Perhaps the largest body of research that might provide insight into this possibility focuses on sexual *risk* behavior (as opposed to sexual behavior more generally), and whether individuals who are depressed or experiencing other negative affective states might be more likely to engage in sexual risk. One explanation for such an association could be that individuals with mood disturbance might be using sexual risk behavior as a tool for emotion regulation, much the way some people engage in ''cutting'' or other self-injurious behaviors. Of course, other possibilities also exist – individuals experiencing a great deal of negative affect might have less capacity for or interest in self-care. However, the data in support of an association between sexual risk behavior and negative affect are mixed. Although some studies have found greater risk among individuals experiencing negative mood (Brown et al., 2006; Shrier, 2009), others have found no connection (Solorio et al., 2008), and a metanalysis of studies occurring before 2001 revealed no overall association between any negative affective state (anger, depression, or anxiety) and sexual risk behavior (Crepaz & Marks, 2001). The lack of an overall association, however, does not rule out the possibility that individual differences might lead some people to engage in this practice; one recent study identified a link between emotional distress and sexual risk-taking specifically among individuals who showed poorer performance on an executive functioning task designed to assess individual differences in the ability to anticipate and weigh affective signals of reward versus cost (Wardle, Gonzalez, Bechara, & Martin-Thormeyer, 2010).

One considerable limitation of looking for evidence of sexuality's possible self-regulatory properties in studies of sexual risk is that the outcome (i.e., risk) by definition does not capture the full range of possible sexual behaviors (e.g., sexual behaviors that are not considered risky, such as sex with a condom, sex with a monogamous partner, or masturbation). Indeed, if sexual behavior's self-regulatory properties were more akin to those of a health behavior like exercise, rather than self-injury, there is no reason to expect that individuals would use *risky* sex per se as a tool for regulating negative affective states, but rather might be more likely to engage in a wide range of sexual behaviors, only some of which are risky. Studies of sexual behavior more generally have shown an association between negative affect and sexuality (independent of risk), providing some indirect evidence for the possibility that this occurs (Hipwell, Stepp, Keenan, Chung, & Loeber, 2011; Waller et al., 2006). Moreover, when asked directly about the effects that negative affect has on their sexuality, 10% of college women in one sample reported increased sexual interests and behaviors when they experience anxious or depressed mood, and these associations were strongest among women who reported the greatest trait potential for sexual excitation (Lykins, Janssen, & Graham, 2006).

When studies look beyond simple associations between affect and crude measures of sexual behavior, they provide still more provocative evidence for the potential for sexuality to regulate mood. For example, some research suggests in addition to potentially motivating sexual behavior, negative feelings might actually enhance and amplify sexual arousal (Bancroft & Vukadinovic, 2004; Bancroft et al., 2003; Barlow, 2002; Ridley, Ogolsky, Payne, Totenhagen, & Cate, 2008), providing an alternate route linking mental well-being to sexual behavior. Importantly, these links may vary according to one's own gender and the gender of one's partner. One study (Ridley et al., 2008) collected daily diaries from gay, lesbian, and heterosexual couples assessing sexual arousal, behavior, and

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positive and negative feelings toward one's partner over a 2-week period. In addition to finding that couples reported more sexual arousal and behavior on days when they reported more positive feelings toward one another, the authors also found that individuals with *male* partners (heterosexual women and gay men) reported greater sexual arousal (although not behavior) on days when they reported more *negative* feelings toward the partner. In contrast, individuals with female partners (heterosexual men and lesbian women) did not show this pattern. It is unclear what occurs among these individuals who report arousal (but not sexual behavior with their partners) in the face of negative affect. Do they engage in other sexual behaviors? One study of HIV-positive men suggests that this could be the case; researchers found that depressed men were less likely to engage in sexual behavior with their main partners, relative to non-depressed men, but were *more* likely to seek sexual experiences with outside casual partners (Bradley, Remien, & Dolezal, 2008).

Together these findings suggest that individuals might indeed feel motivated to regulate negative emotions through sexual behavior, but that these associations might not be observable if we limit our assessments of sexuality to a single behavioral endpoint (e.g., unprotected sex, or sex with a primary partner). More generally, they raise provocative questions about the social-relational contexts in which individuals experience the complex physical and psychological feelings associated with sexual desire and behavior. Investigating these contextual links holds numerous possibilities for understanding the conditions under which some sexual relationships have more health-promoting dynamics than others.

Conclusion

Our basic argument for greater attention to the potentially health-enhancing aspects of sexuality – as opposed to its health *risks* – is by no means new. Within the field of sexual medicine, researchers and clinicians have increasingly considered the need for more substantive research on the health benefits of sexual activity, and the need to integrate a greater focus on the positive dimensions of sexual functioning into clinical practice (e.g., Jannini, Fisher, Bitzer, & McMahon, 2009). Yet we would argue that health *psychologists* must play a greater role in these efforts. Health psychologists' specific expertise in investigating and interpreting complex, reciprocal associations between subjective emotional states, health-relevant cognitions, and health-relevant *behavior* can make a notable contribution to this area, specifically in elucidating some of the most intruiging correlations between sexuality and health that have emerged from medical and epidemiological studies. If we want to foster optimum physical and mental health among youths and adults, we must make a substantive commitment to changing the way we think about – and study – the multiple mechanisms through which positive sexual functioning plays a unique and fundamental role in human well-being across the life course.

Short Biographies

Lisa M. Diamond is Associate Professor of Psychology and Gender Studies at the University of Utah. Dr. Diamond specializes in the study of female sexuality and specifically *female sexual fluidity*, which describes the phenomenon of women periodically developing attractions and relationships that run counter to their overall sexual orientation. Dr. Diamond is best known for her unprecedented 15-year longitudinal study of 100 lesbian, bisexual, heterosexual, and ''unlabeled'' women. Her 2008 book, *Sexual Fluidity*,

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published by Harvard University Press, describes the changes these women underwent in their sexual identities, attractions, and behaviors, and has been awarded the Distinguished Book award from the American Psychological Association's Society for the Study of Lesbian/Gay/Bisexual/Transgendered Issues. Dr. Diamond has received numerous other awards for her work from the American Association of University Women, the Society for the Scientific Study of Sexuality, the Society for the Psychological Study of Social Issues, and the American Psychological Association.

David M. Huebner is Associate Professor of Psychology at the University of Utah. Dr. Huebner's program of research examines the physical and mental health consequences of discrimination. A large body of research documents that individuals from historically marginalized groups (e.g., gay and lesbian individuals, ethnic minorities, and women) suffer disproportionately from mental and physical illness. Dr. Huebner's work seeks to understand what causes these disparities and what can be done to prevent them from continuing. Specifically, his research examines how discrimination is associated with physical and mental health, with an emphasis on exploring the psychological, physiological, and behavioral mechanisms for these associations. In addition, Dr. Huebner is currently involved in a number of projects related to HIV prevention in gay and bisexual men, including young men, men who frequent bathhouses, and African American men. Dr. Huebner is currently working on an NIH-funded project studying how anti-gay discrimination affects gay and lesbian teens' health risk behaviors.

Endnote

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