Development of a Multidimensional Model of the Psychological Experience of Male and Female Orgasm

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Abstract

Orgasm remains the most poorly understood of the human sexual responses. In particular, the psychological experience of orgasm is in need of research attention. The first chapter of this thesis, a critical review of the literature on human orgasm, highlights the dichotomization of the biological and psychological perspectives and the assumption of sex differences in the orgasm response within the literature. A multidimensional approach to describing the orgasm experience in both sexes is advocated, and a three-dimensional model involving sensory, evaluative, and affective dimensions and their respective components is outlined. The second chapter of this thesis summarizes an evaluation of the three-dimensional model using an adjective-rating questionnaire. A sample of 523 female and 365 male university students completed the questionnaire to convey orgasm experiences attained under solitary masturbation and sex with a partner. Results supported the applicability of the model in describing both male and female orgasm, suggesting they involve similar experiences, and revealed the evaluative and affective differences in the orgasm experience as a function of sexual context. Further inquiry into the questionnaire's psychometric properties as a measure of the subjective orgasm experience and the three-dimensional model was conducted and is covered in the third chapter of the thesis. Validity tests entailed investigating the relationships between model components and orgasm intensity, perceived location of orgasm sensation, and relationship happiness and satisfaction. A sample of 503 female and 295 male university students completed the questionnaire to describe orgasm attained through either solitary masturbation or sex with a partner. Good internal consistency of the adjective set was observed. The model again adequately described both male and female orgasm experiences as well, arguing against the reductionist perspective of male orgasm in the literature. Results also generally supported the construct validity of the questionnaire and the model. The

questionnaire, the McGill-Mah Orgasm Questionnaire, appears to be a promising measure for both research and clinical purposes, and future studies elaborating on the questionnaire and the three-dimensional model are recommended.

Résumé

L'orgasme reste la moins comprise des réponses sexuelles chez l'humain. Plus spécifiquement, nous avons besoin de nous attarder d'avantage à l'expérience psychologique de l'orgasme. Dand le premier chapitre de cette thèse, une revue critique de la littérature sur l'orgasme humain mets l'emphase sur la dichotomisation des aspects biologique et psychologique ainsi que sur l'hypothèse qu'il y a une différence entre les sexes lors de la réponse à l'orgasme à l'intérieur de cette littérature. Une approche multidimensionnelle est alors préconisée afin de décrire l'experience de l'orgasme chez les deux sexes, et un modèle tri-dimensionnel impliquant les dimensions sensorielle, évaluative et affective ainsi que leurs composantes respectives sont décrites. Le second chapitre de cette thèse donne un compte rendu d'une évaluation du modèle tri-dimensionnel en utilisant un questionnaire d'évaluation à base d'adjectifs. Un groupe de 523 femmes et 365 hommes, tous des étudiants universitaires, ont complété le questionnaire afin de relater leurs expériences orgasmiques atteint par la masturbation solitaire et avec un partenaire sexuel. Les résultats soutiennent l'application du modèle qui décrit les orgasmes masculin et féminin, suggérant qu'ils entraînent tous deux des expériences similaires, et ont révélé des différences évaluatives et affectives lors de l'expérience de l'orgasme selon le contexte sexuel.

Une étude plus approfondie des propriétés psychométriques du questionnaire en tant que mesure de l'expérience orgasmique subjective et du modèle tri-dimensionnel a été effectuée et est décrite dans le troisième chapitre de cette thèse. Les tests de validité nécessitaient l'étude de la relation entre les composantes du modèle et l'intensité de l'orgasme, la localisation de la sensation d'orgasme perçu ainsi que la relation entre le bonheur et la satisfaction. Un groupe de 503 femmes et de 295 hommes, tous des étudiants universitaires, ont complété le questionnaire décrivant l'orgasme atteint soit par masturbation solitaire ou lors d'une relation sexuelle avec un partenaire. Nous

avons pu observer une bonne uniformité interne des adjectif. Le modèle, une fois de plus, a décrit adéquatement les expériences orgasmiques des hommes et des femmes tout en défendant la perspective diminutive de l'orgasme male dans la littérature. Les résultats ont également, de façon générale, appuient la validité conceptuelle du questionnaire et du modèle. Le questionnaire, le questionnaire sur l'orgasme McGill-Mah, semble être un outil de mesure prometteur tant au niveau de la recherche qu'au niveau clinique. Des études futures faisant l'élaboration du questionnaire et du modèle tri-dimensionnel sont recommendés.

Contributions of Authors

This thesis comprises three papers that were all co-authored by myself and Dr. Irving Binik. The first, a comprehensive review paper, was researched, written, and revised by myself, with Dr. Binik serving in a substantial editorial capacity. The two subsequent studies were developed, conducted, analyzed, and written by myself. Data collection and data entry were performed with the help of research assistants under my supervision. Dr. Binik served in a substantial advisory and editorial capacity during the formulation of research questions, development of the protocol, and writing of the manuscripts. Feedback on the manuscripts was also provided by other individuals mentioned throughout the thesis.

Statement of Original Contributions

This project was conceived, developed, and conducted by myself to address the lack of psychological research on human orgasm as a psychobiological experience rather than a primarily physiological response. The review of the literature, the most comprehensive one existing that addresses both physiological and psychological factors in the orgasm response, makes the need for psychologically oriented research clear and outlines a qualitative model by which this can be accomplished fruitfully.

The papers in this thesis also contribute to the advancement of knowledge by addressing three primary issues. First, the need for a qualitative descriptive model to represent the psychological experience of orgasm has not been addressed in a useful manner within the literature. Typologies of orgasm have been offered to explain unique characteristics of different orgasm experiences from a reductionist, genital-focused perspective, but little has been done to address the issue of the essential psychological features common to all orgasm experiences. Second, almost no literature on the psychological experience of male orgasm as well as comparative research involving both male and female orgasm exists. The first study involved developing the descriptive model outlined in the review that highlights essential characteristics of human orgasm and evaluates applicability to both male and female orgasm experiences in university student samples.

Third, the project also addresses the lack of a standardized, widely used empirical or clinical assessment instrument for comprehensively detailing subjective orgasm experiences in both men and women. An adjective-rating questionnaire based upon the descriptive model was evaluated for its psychometric properties in a second study. The questionnaire will be useful not only in exploring different experiences of orgasm within a common framework, but also in enabling comparisons to be made between male and female orgasm. Such a questionnaire will have beneficial clinical applications as well, as problems with sexuality and

orgasm are reported within many clinical populations. These studies we believe will encourage redirection of research and clinical perspectives of both male and female orgasm towards a biopsychosocial perspective.

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I would first and foremost like to thank my supervisor and mentor, Dr. Irv Binik. His firm, demanding, and knowledgeable guidance, tempered with a sense of humour, understanding, and endless patience, made a challenging undertaking less daunting. Under his influence, I have gained a much more positive, enthusiastic appreciation of the scientific enterprise. His mentorship was not limited to a sterile supervisory role: His continual support, advice and encouragement, and perspectives have impacted significantly on other aspects of my life, and I have changed both professionally and personally for the better. Thank you, Irv, for a very human experience.

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This thesis could not have been accomplished without, first, the tireless efforts of many research assistants. They spoke with professors and arranged recruitment visits, went to the classrooms to recruit participants, gathered and entered the data, and generally kept things running smoothly and efficiently. Their dedication in countless hours of volunteer

work was truly amazing, considering the difficulty of study. I wish to acknowledge a few key assistants whose efforts, enthusiasm, creativity, and capabilities went far beyond the call of duty: Maria Amore, Melissa Balinsky, Sabrina Cimo, Maya Cohen, Kim Farrell, Maura Jette, Matthew Kerner, Josie Morello, Melanie Podsiadlo, Caroline Pukall, Joy Schinazi, and Mark Villacorta. At Concordia University, Julie Larouche, with the support of Dr. William Brender, kept things running and oversaw research assistants there for me. A million thanks, Julie, for taking time to be my eyes, ears, and hands at Concordia. The thesis was also made possible by the professors who allowed me into their classrooms despite their own time constraints and to the individuals who chose to participate in my studies despite its personal nature. My sincere thanks to the National Sciences and Engineering Research Council of Canada and the Social Sciences and Humanities Research Council of Canada for their financial support.

I would like to take the opportunity to extend more a personal note of gratitude to individuals who helped maintain my sanity throughout this process. To Geert Boudewinjse, James Cantor, Cindy Cross, Lauren Dade, Bianca D'Antono, Jeff Drabik, Lisa Koski, Rick Mehta, Eric Ochs, Neil Pilkington, Caroline Pukall, Elke Reissing, David Smith, Susan Taylor, Laila Thaiss, and Shawn Trembath: Thank you, dear friends, for your warmth, caring, and support, for listening patiently and sympathetically when I need to unload, for providing the reality checks when I flipped into the neurotic dimension, and for reminding me that life needs to have a fun side. Your presences have meant and will continue to mean much to me.

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tolerate!) them. His mere presence was always and will always be a deep comfort. My heartfelt love and gratitude to you, Pete. To you, I dedicate this work.

It is with bittersweet memory that I also dedicate this work to my father, Wing Mah, who recently passed away under tragic circumstances before he could see the completion of my degree. As with my brother, my father's unquestioning love and faith were implicit. Family and especially his children were everything to him. He made sure his children were able to go as far as they could, even when that meant sacrifices on his part, and we in turn were a great source of pride to him. Neh, I love you and miss you. I wish you could be here to see this.

General Introduction

The major portion of the introduction to this thesis is covered by the first paper, entitled "The nature of human orgasm: A critical review of major trends". This work comprises a review of the physiological and psychological literature on male and female orgasm dating to 1998 and discusses the rationale for investigating the psychological experience of orgasm as a means for furthering a biopsychosocial perspective of the orgasm response.

The review indicates that knowledge concerning the psychology of human orgasm is at an infancy stage compared to the biology of the orgasm response. Confusion exists concerning what the subjective orgasm experience entails because of the lack of both a standard model of the basic, interrelated constructs involved in the experience and a standardized measure of these constructs. In addition, while studies of the psychological experience of orgasm in women exist, most of the studies available on male orgasm reflect a prevailing biological reductionist perspective equating male orgasm with ejaculation. From a research point of view, the progress towards our understanding of human orgasm as a biopsychological phenomenon has been hindered, and orgasm still remains widely perceived and studied from a primarily biological perspective. From a clinical point of view, the lack of a standardized instrument for assessing orgasm experiences and changes in the experiences in detail has limited the capacity for differential diagnosis, tailoring of treatment strategies, and evaluation of treatment outcomes in individuals presenting with orgasm difficulties.

The two empirical studies included in this thesis address these two primary issues. The objectives of the first empirical study, "Evaluating a three-dimensional qualitative model of the psychological experience of orgasm across sex and sexual context", were to 1) explore the utility of a three-dimensional model of the subjective orgasm experience, and 2) evaluate the validity of the assumption of sex differences in the subjective orgasm experience. The objectives of the second empirical study, "The McGill-Mah Orgasm Questionnaire: A

qualitative and quantitative measure of the orgasm experience", were to 1) present an adjective-rating questionnaire as an approach to measuring the subjective orgasm experience, and 2) to evaluate the psychometric properties of this questionnaire.

Running Head: THE NATURE OF HUMAN ORGASM

The Nature of Human Orgasm: A Critical Review of Major Trends

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Abstract

Human orgasm remains the most poorly understood of the sexual responses. This comprehensive critical review presents a synthesis of the available theoretical and empirical literatures and conceptualizes orgasm both as a relatively invariant and unitary phenomenon and as an experience demonstrating variability. Findings from both normal and clinical human populations are included. Two major trends in the literature, the dichotomization of biological and psychological perspectives and the assumption of sex differences, are highlighted. A new conceptual model is descibed with a view to furthering a biopsychological approach applicable to both sexes.

THE NATURE OF HUMAN ORGASM: A CRITICAL REVIEW OF MAJOR TRENDS

> Rockets, earthquakes, fireworks, full-excursion pelvic thrusting, the final engorgement of the late plateau phase, and the high mountaintop of love of which poets sing: The orgasm, what else?
>
> (Tisdale, 1994, October, p. 77)

This tongue-in-cheek quotation suggests the diversity of approaches taken within the scientific and popular literature to characterize the complex nature of human orgasm. Despite numerous efforts, orgasm remains the most poorly understood of the sexual responses (Bancroft, 1989; Rosen & Beck, 1988), and attempts to propose a universally accepted definition of "orgasm" have met with little success.

Defining Orgasm

Examples of definitions and brief descriptions, listed in Table 1, do not comprise a complete listing of existing definitions but were selected to illustrate concepts typical of existing perspectives. As apparent in Table 1, definitions of orgasm have emphasized either a primarily biological or a primarily psychological perspective; only more recent ones have attempted to integrate both perspectives. Most also apply to orgasm in general or only to female orgasm.

The biological definitions collectively characterize orgasm as a reflexive sensory-motor release from peak states of tension or vasocongestion. However, some emphasize genitopelvic involvement (e.g., Glenn & Kaplan, 1968; Kaplan, 1974; Mould, 1980), whereas others also include extragenital events (Fox, 1976; Masters & Johnson, 1966; Mould, 1980). The psychological definitions also collectively parallel the concept of a release from peak states: a climactic, intense, or pleasurable sensation followed by relief or relaxation. Davidson and Davidson (1980), though, defined orgasm in more qualitative terms as an "altered state of consciousness". The few available definitions of male orgasm link it to ejaculation (Newman, Reiss, & Northup, 1982; Tuckwell, 1989). The few definitions integrating biological and psychological aspects vary from focusing on

genitopelvic changes (Hite, 1976), to including extragenital events (Bancroft, 1989; Reich, 1973; Schiavi & Seagraves, 1995) or linking cerebral and peripheral events (Alzate, 1985). Psychological features vary in complexity from simple changes in intensity (Hite, 1976) or pleasure (Reich, 1973; Schiavi & Seagraves, 1995), to multiple qualitative components (e.g., Bancroft, 1989; Bentler & Peeler, 1979).

Two general problems are apparent. Firstly, taken individually, most of the definitions reflect the current confusion about the nature of human orgasm. The inconsistency even within each perspective is striking, reflecting the widespread disagreement on the importance of different mechanisms (Rosen & Beck, 1988) and a lack of integration of information. The use of vague concepts particularly in earlier formulations, such as "nervous forces" (Ellis, 1938), "discharge," "neuromuscular tension," and "peak of sexual response" (Kinsey et al., 1948, 1953), or "climax of intense feeling" (Terman, 1951; Wallin, 1960; Wallin & Clark, 1963), do little to clarify the situation. Secondly, many definitions depict orgasm in quantitative terms as a "peak" state or as a decrease in (i.e., "release" or detumescence from) a peak state and return to baseline state. This may not differentiate orgasm adequately from a high state of sexual arousal. A qualitative approach, such as Davidson and Davidson's (1980) altered state of consciousness concept incorporated into an integrated definition like Bentler and Peeler's (1979) or Bancroft's (1989) description, may better distinguish between arousal and orgasm on both biological and psychological grounds.

Thus, the definitions reflect two important trends within the general literature, a dichomization of the biological and psychological perspectives and a presumption of gender differences. The purpose of this review is to highlight the two trends in a comprehensive review of two major topics: 1) the fundamental events of orgasm and their underlying mechanisms; and 2) variation in the orgasm response. We will advocate an integrated biopsychological perspective and outline a descriptive approach that we believe will contribute to future work. The literature presented focuses primarily on human data from normal and clinical samples; unless specified, data from animal research are not included.

Fundamental Characteristics and Mechanisms of Human Orgasm

The Biological Perspective of Human Orgasm

The bulk of the research on human orgasm has focused on the physiological changes occurring during orgasm and their neurophysiological and biochemical underpinnings. Central nervous system processes, surprisingly, have been accorded less thorough attention. Various apparatus have been developed to measure, for example, vaginal responses, anal contractions, and other somatic, autonomic, and central processes (cf. Laan & Everaerd, 1998; Rosen & Beck, 1988).

Physiological Changes During Orgasm

In addition to other general accounts (Ellis, 1938; Fox & Fox, 1971; Kinsey, Pomeroy, & Martin, 1948; Kinsey, Pomeroy, Martin, & Gebhard, 1953; Reich, 1973), the most widely cited descriptions of orgasm were provided by Masters and Johnson (1966). From laboratory observations of sexual response, these investigators described analogous whole-body and genitopelvic changes in males and females. The whole-body changes (e.g., tachycardia, elevated blood pressure, the "sex flush") have generally been corroborated (e.g., Abramson & Pearsall, 1983; Bohlen, Held, Sanderson, & Patterson, 1984; Krüger et al., 1998; Littler, Honour, & Sleight, 1974; Nemec, Mansfield, & Kennedy, 1976). Kinsey et al.'s (1948, pp. 160-161) descriptions of behavioural reactions of varying intensity also suggest that the orgasm response is not limited to the genitopelvic region. These descriptions, though, were based on third-person observations of preadolescent boys; generalizability to adult populations remains to be evaluated. While body rigidity during orgasm is typical, spastic muscle contractions, hyperventilation, sweating, vocalizations, rocking pelvic motions, and shuddering have also been reported (Hite, 1976).

Most of the research, though, has focused on genitopelvic phenomena. Masters and Johnson (1966) observed parallel contractions of the genitopelvic muscles and the anal sphincter initially occurring at 0.8-second intervals and then tapering off with longer intercontractile intervals. In measuring anal contractions, other investigators (Bohlen, Held,

& Sanderson, 1980; Bohlen, Held, Sanderson, & Ahlgren, 1982; Gerstenberg, Levin, & Wagner, 1990) also found a similar pattern in which contractile amplitude increased for five to eight contractions and then tapered off with intervals increasing by 0.1-second increments; average duration was 16.7 seconds in females and 25 seconds in males (cf. Bohlen et al., 1980, 1982; Carmichael, Warburton, Dixen, & Davidson, 1994). Interestingly, while some have noted that subjective markers of orgasm (perceived onset, termination) corresponded to physiological markers (Carmichael et al., 1987; Carmichael et al., 1994), others did not find precise agreement (e.g., Bohlen et al., 1980, 1982; Gerstenberg et al., 1990; Masters & Johnson, 1966).

Multiple Orgasm

The capacity for multiple orgasm is attributed to women (Kinsey et al., 1953; Masters & Johnson, 1966; Sherfey, 1972), whereas male orgasm is usually followed by a refractory period during which another orgasm cannot be achieved. However, there are anecdotal accounts of male multiple orgasms, with and without ejaculation. Few large-scale controlled studies exist on multiple orgasm. Operational definitions have been inconsistent, varying from requiring absence of ejaculation until final orgasm (Robbins & Jensen, 1978) or sustained penile tumescence between orgasms in men (Dunn & Trost, 1989), to "sequential" orgasms that include periods of non-stimulation between orgasms (Amberson & Hoon, 1985). Generalizations about multiple orgasm are thus difficult to make.

Sherfey's (1972) contention that successive orgasms in women become increasingly intense has not received consistent support (Amberson & Hoon, 1985; Darling, Davidson, Sr., & Jennings, 1991). In a laboratory observation study (Bohlen, Held, Sanderson, & Boyer, 1982), a single female subject exhibited decreases in anal pressure before each orgasm, but vaginal contractions only with the first orgasm, which was also felt as the most intense.

Kinsey et al. (1948) reported multiple orgasm in 55% of pre-adolescent males but substantially fewer adult males. Male multiple orgasm has been described in a few

uncontrolled self-reports from men who either always had been multiorgasmic or "learned" the capacity (Dunn & Trost, 1989; Hite, 1981; Robbins & Jensen, 1978). While the final (ejaculatory) orgasm was the most intense, single orgasms were as satisfying as multiple orgasms (Robbins & Jensen, 1978). In one study where male multiple orgasm was observed under laboratory conditions (Robbins & Jensen, 1978), only a single subject was involved, and results were difficult to interpret.

Physiological Mechanisms of Orgasm

Male orgasm and ejaculation

In addition to reviews that include animal-based research (e.g., Benson, 1988; deGroat & Booth, 1980; Newman et al., 1982), the major models of male orgasm and ejaculation have been developed by Tuckwell (1989) and Masters and Johnson (1966). Tuckwell's (1989) model describes a neurochemical feedback mechanism in the spinal cord that functions in the following way: 1) Excitatory neurotransmitters first build up in lateral spinal centers to an ejaculatory threshold; 2) spinal motor neurons then trigger genitopelvic muscle contractions and thus ejaculation; and 3) during the refractory period, active transport mechanisms restore baseline neurochemical levels. The short or absent refractory period often noted in pre-adolescent males may be explained by the relative underdevelopment of this feedback mechanism (Tuckwell, 1989) or perhaps a faster rate of neurochemical restoration to baseline. Clinical evidence for the existence of an ejaculatory threshold in spinal-injury patients has since been reported (Sønksen, Biering-Sørenson, & Kristensen, 1994).

Masters and Johnson (1966) equated male orgasm with two invariant phases of ejaculation: the emission phase, in which sperm and seminal fluid from the accessory organs (vas deferens, seminal vesicles, prostate gland) are expelled into the prostatic urethra, causing it to expand; and the ejaculation phase, in which the semen is ejected via contractions of the prostatic urethra and the bulbocavernosal and ischiocavernosal muscles. The external sphincter also contracts during emission to prevent seminal escape, while the bladder neck

contracts during ejaculation to prevent retrograde ejaculation into the bladder. Separate neurophysiological control mechanisms appear to exist for emission and ejaculation (e.g., Benson, 1988; deGroat & Booth, 1980; Newman et al., 1982; Overstreet & Blazak, 1983;). The clinical data on these mechanisms are derived from studies of spinal injury, neuropathic diseases, and genitopelvic-surgery outcomes.

In emission, the accessory organs, the bladder neck, and the external sphincter are innervated by the sympathetic (noradrenergic) hypogastric nerves arising from the T10-L3 spinal center. Motor efferent impulses travel through this pathway to cause contraction of the target muscle groups (e.g., Benson, 1988; Brindley, Sauerwein, & Hendry, 1989; Dieckmann, Huland, & Gross, 1992; Maas et al., 1998; Recker et al., 1996; Recker & Tscholl, 1993). Timing of the external sphincter contractions and prostatic secretion may concurrently be mediated by parasympathetic pelvic nerve impulses from the S2-S4 area (e.g., Bauer, Gelernt, Salky, & Kreel, 1983; Okamura, Hirao, Momose, Okajima, & Yamada, 1985). In spinal-injury patients, complete upper motor lesions are associated with lack of ejaculatory semen, while lower lesions are associated with dribbling semen or premature emission (Kondo, Ohmura, & Saito, 1994; Kurh, Heiman, Cardenas, Bradley, & Berger, 1995). Sympathetic neuropathy involving these mechanisms likely underlies reported problems in diabetes and multiple sclerosis with emission and ejaculation (Ellenberg & Weber, 1966; Fairburn, McCulloch, & Wu, 1982; Fairburn, Wu, et al., 1982; Kolodny, 1971; Schover, Thomas, Lakin, Montague, & Fischer, 1988). However, current measures of diabetic neuropathy and the extent of spinal lesions are indirect at best, and so a pathway with "complete" spinal injury may be intact enough to sustain orgasm. Neuroimaging technologies might provide more precision.

In ejaculation, the S2-S4 spinal center controls the bulbocavernosus and ischiocavernosus muscles via the somatic pudendal pathway. Efferent impulses travel through this pathway to induce muscle contraction, relaxation of the external sphincter, and thereby anterograde ejaculation (e.g., Seftel, Oates, & Krane, 1991). A putative ejaculatory

reflex control center at T12-L2 and communicating with the S2-S4 center appears to control the sequential timing of emission and ejaculation (e.g., Seftel et al., 1991). Self-report studies of surgical outcomes indicate that orgasm may be retained despite loss of ejaculation (Bergmen, Nilsson, & Petersén, 1979; Leiter & Brendler, 1967), although problems have been noted (Beric & Light, 1993; Koeman, Van Driel, Schultz, Weijmar Schultz, & Mensink, 1996) that may be attributable to the lack of standardization of or control over surgical procedures and thus extent of damage to key pelvic nerves. Spinal-cord lesions above T10 are associated with preservation of orgasm (Alexander, Sipski, & Findley, 1993) and higher success rates with ejaculatory induction (Brackett et al., 1988; Le Chapelain et al., 1988). Orgasm is further preserved in procedures where the pudendal system remains intact, even with penile damage (e.g., Bergmen, Nilsson, & Petersén, 1979; Coleman, Listiak, Braatz, & Lange, 1985; Levine, Zachary, & Gottlieb, 1993; Money & Davison, 1983; Shafik, 1995; Witkin & Kaplan, 1982; cf. Tomic & Sjodin, 1992) and autonomic damage (Baxter & O'Kafo, 1984; Schover & Von Eschenbach, 1985); absence of the pudendal-controlled bulbocavernosal reflex is correlated with primary anorgasmia (Brindley & Gillan, 1982; Leduc, Roy, & Poulin, 1992; see Yang & Bradley, 1998). Together, these findings support a distinction between not only emission and ejaculation, but also ejaculation and orgasm. However, genitopelvic processes are typically discussed to the extent that they effect ejaculation (e.g., Gil-Vernet, Jr., Alvarez-Vijande, Gil-Vernet, & Gil-Vernet, 1994; Kollberg, Petersén, & Stener, 1962). The common use of "ejaculation" as an umbrella term for emission, ejaculation, and orgasm reflects a strongly reductionist view of male orgasm.

Female orgasm

While some researchers have suggested that female orgasm has a reproductive purpose by facilitating sperm retention (e.g., Baker & Bellis, 1993; Fox, Wolff, & Baker, 1970; Singh, Meyer, Zambarano, & Hurlbert, 1998), the physiological changes seen are generally not ascribed functions other than as a sexual response. Masters and Johnson (1966) noted that the anterior third of the vagina becomes vasocongested during arousal to form the

orgasmic platform. Accordingly, female orgasm consists of contractions of the orgasmic platform and the uterus, though the latter has rarely been measured (cf. Fox et al., 1970). In the rare case of status orgasmus (prolonged orgasm), the orgasmic platform may initially contract strongly prior to the rhythmic contractions. This would seem to be analogous to the two ejaculatory phases described by Masters & Johnson (1966, p. 117). Vasocongestion also may not return as quickly to baseline levels after female orgasm as with male orgasm (Geer & Quartaroro, 1976; Gillan & Brindley, 1979; Henson, Rubin, & Henson, 1982; Seeley, Abramson, Perry, Rothblatt, & Seeley, 1980), implying that multiple orgasm would occur if immediate stimulation were reapplied.

Theories of female orgasm typically describe the reduction of genitopelvic vasocongestion through a neuromuscular negative feedback loop (Graber, 1981; Kaplan, 1974; Mould, 1980; Perry & Whipple, 1982; Sherfey, 1972). Clitoral stimulation is the central source of sensory input, even during coitus (e.g., Hite, 1976; Masters & Johnson, 1966; Mould, 1980; Shafik, 1993; Sherfey, 1972; cf. Graber & Kline-Graber, 1979a); the vaginal barrel is relatively insensitive to tactile stimulation (e.g., Masters & Johnson, 1966), though it may be sensitive to deep pressure (e.g., Kinsey et al., 1953). Erotic sensation has been reported with tactile stimulation of the anterior vagina (e.g., Alzate & Londoño, 1984; Hoch, 1980; Schultz et al., 1989), but most women have reported that coitus alone rarely results in orgasm (e.g., Fisher, 1973; Hite, 1976; Masters & Johnson, 1966). One neurophysiological theory by Mould (1980) indicates that vasocongestion from clitoral stimulation will produce increasing pelvic-muscle stretch, causing intrafusal fibers within the muscle spindles (muscle-cell structures sensitive to stretch) to conduct afferent impulses to spinal motor neurons. The muscle spindles become "biased" (less additional stretch is needed to initiate muscle contractions) with increasing muscle stretch until a threshold is reached. At threshold, efferent signals trigger the intrafusal fibers to contract, reducing vasocongestion until muscle-spindle bias returns to baseline. This mechanism may account

for the diminishing magnitude of vaginal contractions (e.g., Masters & Johnson, 1966), but whether the reduction in vasocongestion is due to neuromuscular contractions vs. local vascular mechanisms needs further investigation.

Findings from the few studies available of spinal-injured women implicate reflexive mechanisms similar to those in men. Orgasm through clitoral stimulation was correlated with sensitivity in dermatomes for the T11-L2 and S3-S5 spinal segments (Sipski, Alexander, & Rosen, 1995), and an observed reflexive link between the clitoris and pelvic-floor muscles points to the role of the pudendal system (Brindley & Gillan, 1982; Gillan & Brindley, 1979; see Bauer et al., 1983 and Metcalf, Dozois, & Kelly, 1986). On the other hand, orgasm has been reported with complete spinal injury (Sipski & Alexander, 1993; Sipski et al., 1995; Whipple, Gerdes, & Komisaruk, 1996; cf. Beric & Light, 1993), after radical cystectomy (Schover & von Eschenbach, 1985), and even after clitoral/vulval damage through clitoral recession or Pharaonic circumcision (Coleman et al., 1985; Levine et al., 1993; Lightfoot-Klein, 1989; Newman, Randolph, & Parson, 1992). In small-scale studies of transsexual surgery, female-to-male transsexuals often reported relatively better post-operative orgasm outcomes than did male-to-female transsexuals (e.g., Blanchard, Legault, & Lindsay, 1987; Lief & Hubschman, 1993; Lindemalm, Körlin, & Uddenberg, 1986; Rubin, 1993). This suggests that female orgasm, like male orgasm, may be mediated through different pathways besides the pudendal pathway, but the pathways may be more vulnerable to surgical damage in the male. Orgasm in female spinal-injured patients may be maintained through intact pelvic and hypogastric autonomic pathways (Bauer et al., 1983; Komisaruk & Whipple, 1995; Ladas, Whipple, & Perry, 1982; Perry & Whipple, 1981, 1982; Sipski, 1998). While orgasmic dysfunction was associated with severity of neurological impairment in female multiple sclerosis patients (Barak et al., 1996; Hulter & Lundberg, 1995; Mattson, Petric, Srivastava, & McDermott, 1995; Valleroy & Kroft, 1984), this was not found in female diabetic patients (Ellenberg, 1980, 1984; Kolodny, 1971). As with studies of male patients, more precise measures of neuropathy and lesion characteristics are needed.

Biochemical Influences

The role of various neurotransmitter and hormonal systems has been studied with human populations. In addition to studies of normal samples, drug effects on sexual functioning observed in predominantly correlational and/or uncontrolled clinical reports provide indirect evidence on the biochemistry of orgasm. In addition to clinical case reports and studies, reviews of sexual side effects of psychoactive drugs (e.g., Buffum, 1986; Ellison, 1998; Lane, 1992; Meston & Gorzalka, 1992; ; Segraves, 1988, 1989, 1995, 1998) are cited in the following discussion.

Neurotransmitter Systems

Available research on neurotransmitters has looked at the role of the cholinergic, adrenergic, and dopaminergic systems. There is evidence for an inhibitory role of cholinergic mechanisms (Buffum; 1986; deGroat & Booth, 1980; Jani & Wise, 1988; Pollack, Reiter, & Hammerness, 1992; Quirk & Einarson, 1982). However, some investigating antidepressant-induced female anorgasmia have pointed to anticholinergic effects at the peripheral sympathetic ganglia (e.g., Jani & Wise, 1988; Montejo-Gonzalez et al., 1997), while others found no disruptive anticholinergic effect on orgasm induction (Wagner & Levin, 1980). Adrenergic blockers produced retrograde ejaculation, loss of emission, orgasm without ejaculation, or anorgasmia in normal and clinical populations of men (Benson, 1988; Berger, 1979; Buffum, 1986; Fairburn, McCulloch, et al., 1982; Mitchell & Popkin, 1982, 1983; Nininger, 1978) and anorgasmia in women (Segraves, 1988; cf. Riley & Riley, 1981; Shen & Park, 1982). This supports the involvement of peripheral alpha-adrenergic receptors in the sympathetic control of events during orgasm. Drugs that increased central norepinephrine and dopamine levels (e.g., yohimbine, an alpha-adrenergic antagonist; bupropion, an antidepressant) improved drug-induced anorgasmia (Ashton & Rosen, 1998; Jacobsen, 1992; Price & Grunhaus, 1991; Shen & Hsu, 1995;

Walker et al., 1995). Neuroleptics can decrease central dopaminergic activity (Metz, Pryor, Nesvacil, Abuzzahab, & Koznar, 1997), and hence a facilitatory function has thus been attributed to the dopaminergic system (e.g., Cohen, 1992; Metz et al., 1997).

The serotonergic system is also thought to play a major inhibitory role in sexuality. Tricyclic antidepressants (TCAs) and SSRIs, which inhibit serotonin reuptake, MAOIs, which inhibit serotonin breakdown, and lithium, which affects 5-HT1A and 5-HT1C receptors, have been associated with the following, typically dose-related effects in both sexes: delayed/inhibited orgasm (see Ellison, 1998; Lane, 1992; Segraves, 1988, 1989, 1995, 1998 for reviews); less pleasurable orgasm (e.g., Labbate, Grimes, Hines, Oleshansky, & Arana, 1998); and in men, painful or retrograde ejaculation (e.g., Aizenberg, Zemishlany, Hermesh, Karp, & Weizman, 1991; Balon, Yeragani, Pohl, & Ramesh, 1993; Pollack et al., 1992; Schwarcz, 1982), premature ejaculation (Meston & Gorzalka, 1992), anhedonic ejaculation (Rosenbaum & Pollack, 1988), emission during defecation (Pollack et al., 1992), and orgasm without ejaculation (Nininger, 1978). Cyproheptadine, a serotonin antagonist, can relieve orgasmic/ejaculatory inhibition caused by antidepressants (Arnott & Nutt, 1994; Cohen, 1992; McCormick, Olin, & Brotman, 1990; Riley & Riley, 1986; Segraves, 1998; cf. Feder, 1991 and Price & Grunhaus, 1990).

However, serotonergic effects have not been consistent. Symptom remission over time has occurred (Ashton, Hamer, & Rosen, 1997; Labbate et al., 1998; Montejo-Gonzalez et al., 1997; Nurnberg & Levine, 1987). Fluoxetine, trazodone, clomipramine, and zuclopenthizol have been associated in case studies with spontaneous orgasm or ejaculation and hyperorgasmia, in some cases along with yawning (e.g., Garcia-Campayo, Sanz-Carrillo, & Lobo, 1995; Lauerma, 1995; McLean, Forsythe, & Kapkin, 1983; Morris, 1991; Purcell & Ghurye, 1995); the higher serotonin levels may stimulate the release of corticotrophin-releasing factor, a substance involved in yawning and sexual response (Meston & Gorzalka, 1992). Serotonin levels were also found to be higher with moderate vs. large or chronic doses of amphetamines, and yet sexual functioning was better with the

lower dose (Meston & Gorzalka, 1992). Chronic amphetamine or cocaine use causes delayed or inhibited orgasm/ejaculation in some but improves drug-induced ejaculatory problems or enhances orgasm through euphoria in others (Bartlik, Kaplan, & Kaplin, 1995; Meston & Gorzalka, 1992). However, most drugs thought to impact mainly on one neurotransmitter system more likely affect multiple, interconnected systems through complex, non-linear actions that are not yet completely understood. These effects can also change over time as the system accommodates, for example, through changes in receptor density. Further, problems in generalizating data from clinical samples to normal populations, especially when data are from uncontrolled, small-scale studies or case studies, make cautious conclusions about how particular neurotransmitters contribute to human orgasm.

Hormonal Systems

Evidence for the role of particular hormones in orgasm is more equivocal. Goldstein and Hansteen (1977) found no evidence for the role of endorphins in male orgasm/ejaculation, whereas Gillman and Lichtigfeld (1983) found that naloxone, an opiate antagonist, could enhance or inhibit female orgasm. Ejaculation problems may follow use of heroin, an opiate derivative with depressant effects on the nervous system (e.g., Mintz, O'Hare, O'Brien, & Goldschmidt, 1974), but this could be related to concurrent changes in testosterone (Mirin, Meyer, Mendelson, & Ellingboe, 1980). Hyperprolactinemia has also been associated with orgasm/ejaculatory problems (Hulter & Lundberg, 1994; Oseko, Taniguchi, Kono, Imura, & Komatsu, 1983). Using neuroendocrine and cardiovascular measures with male subjects masturbating to orgasm, Krüger and colleagues (1998) observed a significant rise in prolactin levels during orgasm that remained elevated thereafter. This suggests that prolactin plays a role in the male refractory period, but whether prolactin is directly involved in orgasm is uncertain.

With respect to steroid hormones, cortisol levels did not change during orgasm (Ismail, Davidson, Loraine, & Fox, 1972; Krüger et al., 1998). A positive association between

testosterone or dihydrotestosterone level and both male and female orgasm exists (e.g., Burris, Banks, Carter, Davidson, & Sherins, 1992; Clopper, Voorhess, MacGillivray, Lee, & Mills, 1993; Davis, 1998a, 1998b; Fox, Ismail, Love, Kirkham, & Loraine, 1972; Mantzoros, Georgiadis, & Trichopoulos, 1995; Pirke & Kockott, 1982; Salmimies, Kockott, Pirke, Vogt, & Schill, 1982), but increased sexual desire and activity may mediate this finding (Knussman, Christiansen, & Couwenbergs, 1986; Moss, Panzak, & Tarter, 1993). Female orgasm frequency was not related to fluctuations in androgen levels throughout the menstrual cycle (Van Goozen, Wiegant, Endert, Helmond, & Van de Poll, 1997). In other studies of the menstrual cycle, peak orgasm frequencies have been reported just prior to ovulation (estradiol and testosterone at peak), followed by reduction during the luteal phase (progesterone at peak) (Cutler, Garcia, & McCoy, 1987; Dennerstein, Burrows, Wood, & Hyman, 1980; Matteo & Rissman, 1984; Udry & Morris, 1968, 1970, 1977), though different measures of menstrual phase did not always correspond (Udry & Morris, 1977). Potential confounds (e.g., mood and energy fluctuations, the use of partner- vs. female-initiated activity as measures of sexual interest, constraints on sexuality during menstruation) must be considered in interpreting a pre-ovulatory peak in orgasm frequency.

Both early (Campbell & Petersen, 1953; Fox & Fox, 1971) and more recent research has focused on oxytocin (see Carter, 1992, and Ivell, Balvers, Rust, Bathgate, & Einspanier, 1997, for review). Significant elevations in oxytocin level have been observed at orgasm (Carmichael et al., 1987, 1994; Fox & Knaggs, 1969; Murphy, Seckl, Burton, Checkley, & Lightman, 1987; Murphy, Checkley, Seckl, & Lightman, 1990; Ogawa, Kudo, Kitsunai, & Fukuchi, 1980), but not during arousal (Murphy et al., 1987; cf. Carmichael et al., 1987, 1994 for conflicting findings). Oxytocin may work, possibly synergistically with sex hormones (Anderson-Hunt & Dennerstein, 1994), to facilitate muscle contractions during orgasm (e.g., Carmichael et al., 1987, 1994; Murphy et al., 1987); oxytocin level was associated with orgasm intensity in multiorgasmic women and anal electromyographic measures in both sexes (Carmichael et al., 1994). However, this mechanism has not been

directly evaluated beyond correlational designs. Murphy et al. (1990) found a link between orgasm pleasure and oxytocin level by reducing oxytocin level with naloxone, an opiate antagonist, but their finding could be attributed to changes in endorphin, not oxytocin levels.

Central Nervous System (CNS) Involvement

Locating brain structures involved in orgasm addresses the issues of supraspinal control of orgasm (Newman et al., 1982; Tuckwell, 1989) and whether orgasm involves solely peripheral responses. In his neurochemical feedback model of male orgasm, Tuckwell (1989) theorized a similar mechanism in the septal region that generates pleasure during orgasm, underscoring the role of limbic structures in distinguishing ejaculation as a peripheral event and orgasm as a central and peripheral event. Some believe that spontaneous ejaculation and premature emission associated with mid-thoracic and T12-L2 spinal lesions result from loss of supraspinal inhibition (Kurh et al., 1995; Moosman & Kapoor, 1994).

Surprisingly, few studies of CNS events occurring during orgasm have been conducted beyond small-scale EEG (Cohen, Rosen, & Goldstein, 1976; Graber, Rohrbaugh, Newlin, Varner, & Ellingson, 1985; Mosovich & Tallaferro, 1954) and neuroimaging studies (Barak et al., 1994). The evidence spans the range from no EEG changes during orgasm (Graber et al., 1985) to involvement of the entire nervous system (Mosovich & Tallaferro, 1954). Evidence for right-hemisphere involvement has been found (Cohen et al., 1976; Tiihonen et al., 1994), even controlling for handedness with one male subject (Cohen et al., 1976), and specifically for the right prefrontal cortex (Tiihonen et al., 1994) or right frontal-temporal or subcortical septal areas (Heath, 1972; Warnecke, 1976). Decreased ejaculatory/orgasm rates have been observed in stroke patients (Bray, DeFranke, & Wolfe, 1981), and one patient with a right frontal-parietal lesion also reported seizures induced by orgasm (Berthier, Starkstein, & Leiguarda, 1987). In an MRI study of multiple-sclerosis patients, anorgasmia was correlated with brain-stem and pyramidal abnormalities, as well as total area of brain lesions (Barak et al., 1996). The generally uncontrolled, correlational nature of these studies, though, preclude definitive conclusions, and studies with clinical populations (e.g.,

Barak et al., 1996; Heath, 1972) are confounded with extreme disease and medication effects. While most studies focused on surface brain activity, contemporary imaging technologies like PET and MRI would be useful in further exploring the role of subcortical structures like the limbic system in orgasm, as well as relationships between brain activity and peripheral physiological events.

Discussion of the Biological Perspective

The enormous body of literature presented makes apparent the complexity of human orgasm as a multi-system response. Yet the lack of integrative research makes it difficult to see how these systems interact to generate the response. In addition, clinical evidence is useful and makes up a substantial portion of the reviewed information, but generalization to normal populations may be problematic because of the often uncontrolled nature of clinical studies and potential confounds associated with diseases processes and interventions.

Research on how orgasm is triggered and maintained has emphasized neuromuscular feedback mechanisms, conceptualizing orgasm as a peripheral sensory-motor reflex as suggested by the definitions reviewed earlier. However, the emphasis on reflexive genitopelvic mechanisms has been to the relative neglect of extragenital and CNS events and their relationships with genitopelvic events. Genitopelvic and whole-body events, such as anal contractions, tachychardia, and blood-pressure elevation, together may provide a more reliable index of the orgasm response. Studies with concurrent peripheral and CNS measures are also recommended to improve convergent validity and evaluate reciprocal mechanisms across different levels.

Much of the theoretical interest has focused on female orgasm as a pleasurable sexual response and identifying the physiological structures that will trigger it. Male orgasm, on the other hand, has often been equated with the physiological marker of ejaculation, and extensive clinical research exists to this effect. In the Diagnostic and Statistical Manual of Mental Disorders, fourth edition (American Psychiatric Association, 1994), "orgasm" and "ejaculation" appear to be interchangeable in the diagnostic features of Male Orgasmic

Disorder. Only in the section on associated features is it indicated that orgasm can occur in the absence of emission. Thus, a bias is evident towards ascription of all genitopelvic changes in males to the service of ejaculation. Yet, much of the information reviewed suggests two things. First, male and female orgasm may be more similar with a few differences rather than more different with a few similarities. That most genitopelvic structures can be considered homologous would argue in favour of this. Certainly, more controlled comparative research is required to clarify this still-controversial issue. Second, orgasm and ejaculation involve distinct neuromuscular mechanisms. A clear distinction needs to be made between ejaculation as the most visible and reliable concomitant of male orgasm and ejaculation as defining male orgasm. We argue for the former and believe that at this point it is premature to treat male and female orgasm a priori as two completely different responses.

The Psychological Perspective of Human Orgasm

While contributing enormously to our understanding of the orgasm as a physiological response, the biological perspective has been insufficient for explaining orgasm as an erotic sexual experience. The latter requires subjective awareness/labelling of a response as "sexual" (Rosen & Beck, 1988). This can be illustrated by analogy to another psychophysiological phenomenon, that of pain. "Pain" comprises the experience of, for example, a cut in the skin and not only the cut itself (Melzack & Wall, 1996). Similarly, ejaculation and pelvic contractions require the subjective experience of these events as erotically intense and pleasurable to be "orgasmic", otherwise we might imbue them with as much significance as a sneeze. Yet, it has only been recently that significant attention been given to the psychology of orgasm. Attempts to ascertain the subjective components of orgasm as well as possible psychological and psychosocial influences are reviewed.

The Subjective Experience of Orgasm

Masters and Johnson (1966) outlined the subjective perception of orgasm as tied to the physiological events identified. Emission is associated with a feeling of ejaculatory

inevitability, whereas ejaculation involves contractile sensations and pleasure associated with seminal volume. Female orgasm includes a sensation of stoppage, followed by a suffusion of warmth from the pelvic area to the body, and finally pelvic throbbing. These descriptions, though, are compilations based on anecdotal reports and do not account for variation in the reports.

More recent work suggests a multidimensional nature beyond the perception of physiological events. Davidson (1980) developed a classification including perception of physiological events (e.g., general muscular sensations, localized physical sensations) and general mood changes (e.g., release of tension; and altered state of consciousness). Altered states of consciousness comprise exteroceptive/interoceptive changes; alterations in sense of space, time, and identity; strong emotions; and motor-output changes (Davidson & Davidson, 1980, p. 292); Swartz (1994) also described the "absorbed state", a "nondeliberate...[condition] of consciousness involving a narrowed focus of attention and a blurring of reality boundaries" (p. 245). In an unpublished doctoral dissertation on female orgasm involving ratings of descriptive phrases from 318 women, Warner (1981) evaluated a similar model using separate factor analyses of items thought to reflect physical and affective dimensions. Analyses yielded six physical scales (Release, Throbbing, Continued Arousal, Vaginal Sensation, Sudden Cessation, Non-Genital) and four affective scales (Evaluative, Depressed, Unresponsive, Almost). The low mean scores obtained for the latter three affective scales reflect the covariance of negative items that otherwise may not comprise components of the orgasm experience per se; orgasm itself was defined as a "peak experience". Because of their exploratory nature, Warner's findings require further replication, but both Davidson's and Warner's models illustrate the reciprocal influences between cognitive and sensory events in determining the orgasm experience (Davidson, 1980, p. 291).

Other research indirectly supports a multidimensional approach. Interestingly, almost all of this research focuses on the female orgasm experience. Studies have examined

numerous dimensions: latency, intensity, duration, quality, and variance of these aspects over time; receptivity and anticipation level; ease in achieving orgasm and number of orgasms; pervasiveness of the orgasm and satisfaction during/after orgasm; and release of tension and degree of post-orgasmic exhaustion (e.g., Butler, 1976; Fisher, 1973; Sholty et al., 1984). Findings described by Masters and Johnson (1966) have been observed: a feeling of inevitability; suspension of sensation followed by explosive pleasure radiating throughout the pelvic area; and finally tension and warmth throughout the entire body (Clifford, 1978; Hite, 1976). Post-orgasm feelings include happiness, love, relaxation, and satisfaction (Fisher, 1973; Hite, 1976). Altered-consciousness experiences have been reported (Fisher, 1973; Hite, 1976; Kinsey, 1951), which Kinsey et al. (1951) and Bancroft (1989) believed may render self-reports problematic. Some studies have revealed that, relative to measured duration of pelvic contractions, subjective duration of orgasm tended to be much lower. For example, in Levin and Wagner's (1985) study, average reported duration (12.2 seconds) was less than half of the objectively measured duration (26.0 seconds). However, whether this reflects real changes in consciousness during orgasm vs. subjects' general capacity to keep accurate track of time while attention is focused elsewhere needs to be assessed.

Comparing Male and Female Orgasm Experiences

Few studies have looked at the psychological experience of male orgasm, probably because of the reductionist emphasis on ejaculation; Masters and Johnson (1966) noted that "[t]here is...variation in...the female orgasmic experience, while the male tends to follow standard patterns of ejaculation reaction..." (p. 6). Some studies have found that women tend to ascribe words with more romantic meanings, whereas men ascribe words with more physical meanings (Robinson, Balkwell, & Ward, 1980). However, confounding factors such as sex guilt, religiosity, erotophilia-erotophobia, and social-desirability responding may explain such sex differences (Plaud, Gaither, & Weller, 1998). The scant research comparing male and female orgasm experiences, however, demonstrates striking similarity

between male and female accounts (Proctor, Wagner, & Butler, 1973; Vance & Wagner, 1976). In Vance and Wagner (1976) and Proctor et al.'s (1973) studies, medical students, obstetrician-gynecologists, and psychologists were unable to differentiate between descriptions of orgasm written by male and female students. Findings from one laboratory study also suggested that seminal volume was not related to pleasure (Gerstenberg et al., 1990), though other anecdotal reports suggest that orgasm with ejaculation feels different from non-ejaculatory orgasm (Hite, 1981). Prepubertal boys also experience orgasm despite absence of ejaculation (Kinsey et al., 1948).

Psychological Correlates of the Orgasm Experience

Demographic factors related to attitudes and mores, such as age (e.g., Hoon & Hoon, 1978; Sholty et al., 1984), decade of birth (Kinsey et al., 1948), and educational, professional, and social standing (e.g., Fisher, 1973; Kinsey et al., 1948, 1951), have been correlated with male and female orgasm rates, though partly perhaps because of a social-desirability factor. Other psychological and psychosocial correlates of the orgasm experience have been explored. In fact, some suggest that psychological mechanisms can trigger female orgasm. In a laboratory-observation study, no significant differences were observed in heart rate, pupil diameter, and systolic blood pressure between orgasm induced by genital stimulation vs. imagery (Whipple et al., 1992). All subjects, though, were asked to induce orgasm first through genital stimulation and then through imagery, and so carry-over effects of residual arousal may confound the latter condition. Levin & Wagner (1987) observed one woman who claimed to have achieved orgasm without exhibiting expected vaginal changes, but the subject later admitted stopping short of achieving orgasm. Approximately 30% of female subjects have reported nocturnal orgasm (Henton, 1976; Wells, 1983, 1986), which is similar to waking orgasm (Wells, 1983) but occurring apparently without genitopelvic input. Likewise in spinal-injured patients, reports of orgasm imagery while dreaming (Money, 1960), orgasm separate from ejaculation (Phelps et al., 1983), and descriptions similar to those from intact subjects (Bregman & Hadley, 1976) exist. However, it is not

clear from Money's (1960) findings whether patients' reported orgasm imageries represent "true" orgasm experiences. Because extent of neuropathology or spinal injury is typically assessed indirectly, whether the lack of afferent genitopelvic input was actually complete is also uncertain.

Masters and Johnson (1966) themselves stated that: "[f]emale orgasm, whether...attained within...an interpersonal relationship...or by means of any combination of erotically stimulative activity and/or fantasy, remains a potpourri of psychophysiological conditions and social influence" (Masters and Johnson, 1966, p. 133). The relationships of primarily the female orgasm experience with psychosexual and relationship factors, as well as early experiences and attitudinal and trait variables have thus been explored.

Psychosexual Factors

Many psychological factors examined concern level of sexual adjustment or functioning. High female coital orgasm frequency or consistency was related to more initiation of and active participation during sexual activity by women, as well as a high degree of sexual responsiveness and awareness of biological arousal (e.g., Adams, Haynes, & Brayer, 1985; Fisher, 1973; Hoon & Hoon, 1978; Hurlbert, 1991; Hurlbert, Apt., & Rabehl, 1993; Singh et al., 1998); higher masturbatory/coital rates and overall sexual-activity rates (e.g., Fisher & Osofsky, 1967; Huey, Kline-Graber, & Graber, 1981; Hurlbert & Whittacker, 1991; Raboch & Raboch, 1992; Singh et al., 1998; Terman, 1951); post-orgasm satisfaction and relief (e.g., Fisher, 1973; Wallin & Clark, 1963; Waterman & Chiauzzi, 1982); and satisfaction with one's sex life (Haavio-Mannila & Kontula, 1997). While studies of erotophilia/erotophobia have generally not shown significant association with frequency of female orgasm (Hurlbert et al., 1993) or premature ejaculation (Grenier & Byers, 1997), low orgasm consistency was associated with greater sex guilt (Davidson & Moore, 1994; Kelly, Strassberg, & Kircher, 1990); improvement in orgasm rates may be related to decreased sexual guilt and increased sexual experimentation (Fisher, 1973; Kinsey et al., 1951; Myers et al., 1983; Sholty et al., 1984). This mechanism may underlie findings

of a facilitative effect of moderate alcohol use on the female orgasm frequency and pleasure (Klassen & Wilsnack, 1986; Malatesta et al., 1982) whereas deleterious alcohol effects have been found with male orgasm (Malatesta et al., 1979; Mandell & Miller, 1983; cf. Crenshaw & Goldberg, 1996) and heavy drinking or dependency (Gavaler et al., 1993, 1994; Klassen & Wilsnack, 1986). Expectations about alcohol effects on sexuality may reduce sociocultural inhibitions surrounding female sexuality (e.g., Frank & Lang, 1990; Klassen & Wilsnack, 1986).

The quality of sexual stimulation, including use of coital fantasy during masturbation (Fisher, 1973; Lentz & Zeiss, 1983-84) and varied sexual activity and extended foreplay (Myers et al., 1983; Singh et al., 1998; Swieckowski & Walker, 1978; Waterman & Chiauzzi, 1982), appears to facilitate the female orgasm experience. However, some have noted that varied activity interferes with orgasm achievement (Hoon & Hoon, 1978; Masters & Johnson, 1966). Instead, uninterrupted pressure, rhythmic stimulation, and external genital friction are required to build the necessary muscular tension (de Bruijn, 1982; Kinsey et al., 1951). What stimulation is effective, though, may depend on "stage" of the sexual encounter (e.g., beginning of foreplay vs. after prolonged period of foreplay) as well as sexual context (solitary masturbation vs. sex with a partner). Self-reported orgasm characteristics themselves, such as duration of orgasm and strength of vaginal or muscle spasms, were associated with reported orgasm strength, satisfaction (Fisher, 1973; Kinsey et al., 1951), and consistency (e.g., Bohlen et al., 1980; Bohlen, Held, Sanderson, & Ahlgren, 1982; Carmichael et al., 1987, 1994).

Relationship Factors

Partner variables within the sexual context, such as sexual compatibility, partner involvement, and female orgasm occurring before or simultaneously with partner orgasm, were associated with higher female orgasm frequency and satisfaction (Darling, Davidson, Sr., & Cox, 1991; Singh et al., 1998). Bressler and Lavender (1986) found that female bisexuals and lesbians were more likely than heterosexual women to describe orgasm as

"strong" with a sensation of buildup. Group differences in sexual behaviour may account for this finding. More general relationship variables such as marital satisfaction, happiness, and stability have been reliable predictors of orgasm consistency, quality, and satisfaction (e.g., Gebhard, 1966; Hurlbert, 1991; Hurlbert & Apt, 1994; Hurlbert et al., 1993; Lunde, Larsen, Fog, & Garde, 1991; McCabe, 1997; Sholty et al., 1984; Sing et al., 1998). Emotional closeness with the partner as as critical to female as well as male multiple orgasm (Dunn & Trost, 1989; Robbins & Jensen, 1978); even Sudanese women who had undergone severe genital mutilation reported having orgasm with a close marital relationship (Lightfoot-Klein, 1989). However, because of the correlational designs used, it is uncertain, for example, if a close partner relationship directly enhances the subjective and emotional qualities of orgasm; indirectly enhances orgasm by facilitating communication, thereby promoting optimum sexual behaviour leading to orgasm; or indirectly enhances orgasm by reducing inhibitions and anxiety. Psychological and sexual adjusted prior to the relationship may also have facilitated relationship strength and likelihood of orgasm.

The Role of Early Experiences

Infrequently orgasmic females may show only limited improvement in orgasm rates over time (Fisher, 1973; Raboch & Raboch, 1992; cf. Hite, 1981). Whether longer foreplay or coitus can increase orgasm frequency is conflicting (Gebhard, 1966; Huey et al., 1981; Kinsey et al., 1951), and in one study, additional clitoral stimulation did not increase nonmasturbators' coital orgasmic capacity (Leff & Israel, 1983). On the other hand, pre-marital sexual and orgasm experiences is linked with higher orgasm frequency (Darling, Davidson, Sr., & Jennings, 1991; Fisher, 1973; Newcomb & Bentler, 1983; Raboch & Barták, 1983; Raboch & Raboch, 1992). This has led to speculation that "priming" mechanisms involving early sexual learning and conditioning (Kinsey et al., 1951; Mead, 1955) determine female orgasm capacity. Mead (1955) theorized that sociocultural differences in female orgasm capacity may reflect a potential for orgasm dependent on sociocultural learning: In sexually liberal cultures, highly varied, diffuse foreplay may serve

to develop this potential by promoting bodily receptivity to sexual stimulation. However, to our knowledge, no research is available which has formally evaluated this theory. Any cross-cultural differences may also reflect sociocultural willingness to report such intimate behaviour.

Parental influences and childhood experiences have been correlated with female orgasm (Fisher, 1973, 1980; Newcomb, 1984; Raboch & Raboch, 1992; Terman, 1951). Fisher (1973, 1980) found that low orgasm-responsiveness females more often reported unavailable fathers and theorized that because these women may have difficulties with separation/loss, orgasm is threatening because it entails brief loss of object attachments. However, his theory remains speculative and is not clearly supported by his retrospective data: None of the subjects exhibited clinical levels of neuroticism or psychopathology. Evidence for the role of child-abuse history in later orgasmic dysfunction is conflicting (Becker, Skinner, Abel, & Chichon, 1986; Becker, Skinner, Abel, & Treacy, 1982; Fromuth, 1986; Mackay et al., 1991; Tsai, Feldman-Summers, & Edgar, 1979). In a recent study of 202 female students, childhood sexual abuse was associated with orgasm disorders (Kinzl, Mangweth, Traweger, & Biebl, 1996); other retrospective studies with female (Feinauer, 1989; Kaplan & Green, 1995) and male samples (Kinzl, Mangweth, Traweger, & Biebl, 1995) have found similar associations. However, one study found that female students reporting childhood or adult sexual abuse did not differ from non-abused students on rates of anorgasmia (Bartoi & Kinder, 1998). Different operational definitions of abuse may partly account for the inconsistency across findings.

Attitudes and Personality Traits

In psychoanalytic theory, female psychosexual adjustment has been linked to the capacity to experience vaginally rather than clitorally induced orgasm. Women who require clitoral stimulation for orgasm may be perceived as somewhat (but not pathologically) less mature than women who can attain coital orgasm (Taublieb & Lick, 1986; Wilcox & Hager, 1980). Low orgasm-consistency or anorgasmic females also report relatively more self-

blame attributions (Loos, Brudges, & Critelli, 1987); repressed emotions and control needs (Bridges, Critelli, & Loos, 1985; Fisher, 1973); more conservative attitudes (Derogatis, Fagan, Schmidt, Wise, & Gilden, 1986); and greater dependency, apprehensiveness, and negativity (Davidson & Moore, 1994; Terman, 1951). Primary anorgasmic women have been found to be more stable, naive, shyer, and less sexually well adjusted than situationally anorgasmic women (Welsher, 1981). In most of these studies, though, scores were still within normative range. Attitudes towards masturbation, extraversion, and neuroticism may indirectly influence female orgasmic responsiveness indirectly through their impact on sexual behaviour (Bentler & Peeler, Jr., 1979). Overall, associations between female orgasm response and psychological adjustment variables have not been supported (Fisher, 1973; Raboch & Raboch, 1992; cf. Davidson & Moore, 1994; Kelly et al., 1990; Terman, 1951). Studies of male orgasm and ejaculation showed a correlation with self-actualization (Waterman & Chiauzzi, 1982; Waterman, Chiauzzi, & Gruenbaum, 1979), depression, and sensation seeking (Husted & Edwards, 1976).

Discussion of the Psychological Perspective

Psychologically based research thus far has been relatively unsystematic, and the dearth of empirically evaluated psychological models is surprising given that achieving orgasm is meaningful because of its intensely pleasurable, erotic qualities. Further studies of qualitative models of the orgasm experience (e.g., Davidson, 1980; Warner, 1981) in particular should receive attention, as frequency measures are an insensitive, all-or-none index of orgasm functioning. Qualitative models can better enable investigation of how different factors might impact on specific aspects of the subjective orgasm experience. For example, experiences of immersion or loss of awareness during orgasm suggests the need to look at the association between cognitive-attentional mechanisms and cortical or subcortical events. The effect of psychosocial variables like quality of the relationship or sexual context (sex with a partner vs. solitary masturbation) on specific psychological and physiological aspects of orgasm could

be better investigated. Identifying how different aspects of the orgasm experience itself might interrelate would also be possible (e.g., the impact of emotional components on sense of fulfillment or satisfaction).

While Bancroft (1989) and Kinsey et al. (1951) both believed that changes in perceptual capacity during orgasm may preclude introspective self-report, inspection of self-report data indicates that, within the limits of language, people appear to be aware of and able to report their experiences. The problem may instead lie in generating systematic language to convey such a complex experience. Data are typically retrospective and obtained using idiosyncratically developed, inadequately described and/or validated measures. Results thus reveal a potpourri of experiences that are difficult to generalize or compare across studies. Most studies also employed correlational designs, which yield valuable information but preclude statements of causal direction of effects. The urgent need for a universally accepted, standardized self-report instrument or vocabulary, in which reliability and validity issues have been considered in its development becomes apparent. Except for the Peak of Sexual Response Questionnaire for women (Warner, 1998), none of the instruments in one compendium of sexuality-related measures (Davis, Yarber, Bauserman, Schreer, & Davis, 1998) evaluates qualities of the orgasm experience beyond attainment rates, general intensity/satisfaction, or other basic variables.

The necessary reliance on self-report methods for investigating psychological phenomena does pose problems. Self-report data on personal issues such as sexuality are subject to distortions related to memory and retrospective reporting, demand characteristics, and other response biases; self-deceptive enhancement and impression-management biases, depending on different personality factors, may even appear under anonymous testing conditions (Meston, Heiman, Trapnell, & Paulhus, 1998; Triveldi & Sabini, 1998). Two excellent reviews of methodological factors influencing self-report of sexual behaviours (Catania, Binson, Van Der Straten, & Stone, 1995; Weinhardt, Forsyth, Carey, Jaworski, & Durant, 1998) suggest ways to decrease the probability of response biases.

The study of the orgasm experience appears to have been influenced by assumptions surrounding the identification of female sexuality with psychological experience versus male sexuality with physical performance. Almost all of the literature cited has focused on female orgasm, with very few comparisons to male orgasm. However, male orgasm, outside of ejaculatory processes, would appear to encompass a complex phenomenology similar to that of female orgasm; psychological processes, arising from as-yet undetermined processes in the CNS, confer erotic qualities to both male and female orgasm. Further evidence to this effect is presented in the section on variation in the orgasm response.

The Biopsychological Perspective of Human Orgasm

Despite their reductionist perspective, Kinsey et al. (1948) distinguished between the physiological (orgasm) and the psychic (orgastic pleasure) components of orgasm. Whereas recent research on related phenomena such as premature ejaculation (PE) is moving towards a biopsychological perspective (e.g., Grenier & Byers, 1995, 1997; Metz et al., 1997; Rowland, 1998; Rowland, Cooper, Slob, & Houtsmuller, 1997; Rowland & Slob, 1995; Strassburg, Kelly, Carroll, & Kircher 1987; Strassburg, Mahoney, Schaugaard, & Hale, 1990), efforts to integrate psychological and biological data on orgasm have not gone much beyond model development. Two such models (Bancroft, 1989; Davidson, 1980) feature the psychological conceptualization of orgasm as an altered state of consciousness. Bancroft (1989) combined this concept with the physiological and subjective events described by Masters and Johnson (1966) and further proposed two possible CNS mechanisms: 1) The intensity of CNS mechanisms may generate the altered-consciousness state and influence the intensity of spinal events; alternatively, 2) the relative prominence of central inhibitory and excitatory CNS events may mediate orgasm intensity and duration of the refractory period. This contrasts with Tuckwell's (1989) model, in which the refractory period is attributed to neurochemical processes in the spinal cord.

Davidson's (1980) bipolar hypothesis is based on the distinction between emission and ejaculation. Neural substrates of emission send efferent impulses "downwards" to trigger

emission and "upwards" to produce sexual satiety, a refractory period, and loss of arousal that do not, however, constitute "complete orgasm" (Davidson, 1980, p. 302). In contrast, ejaculatory substrates generate impulses downwards to trigger pelvic-muscle contractions and upwards to produce "true" orgasm, an altered state of consciousness without a refractory period. Both substrates collectively form the "organ of orgasm", the location and nature of which were not specified. The model is applicable to female orgasm (Davidson, 1980): As female orgasm does not include emission but does involve the same pelvic-muscle contractions seen during ejaculation, the capacity for multiple orgasm would be predicted.

These two models provide plausible foundations for biopsychological models of orgasm but are both still limited. For example, although Davidson (1980) believed that pleasure and satisfaction are influenced by psychosocial, environmental, and interpersonal factors, neither model includes these factors. As the causal role of these intertwining factors is not yet clear, it may indeed prove difficult to incorporate them at this point. In the bipolar hypothesis, which is based on uncontrolled anecdotal data on male multiple orgasm, little information is given on the "organ of orgasm", the brain regions associated with sexual satiety vs. orgasm without satiety, or why the altered state of consciousness should be dependent upon ejaculatory events. In speculation to some of these issues, the spinal control centers described earlier for emission and ejaculation would be prime candidates. The relative roles of the dopaminergic and serotonergic neurotransmitter systems might also prove useful in explaining when sexual satiety vs. the altered state of consciousness of orgasm occurs.

Variability of Human Orgasm

The previous discussion reveals the potential for biological and psychological variability in the orgasm response, and identifying a "typical response pattern" of orgasm may thus be simplistic. Several typologies of orgasm have been formulated to address this issue, but only in female orgasm. The major typologies are biological in nature and emphasize the role of genitopelvic triggers.

Biologically Based Typologies of Orgasm

The belief in multiple female erogenous zones and research on their neurophysiological underpinnings (Graber, 1981; Komisaruk & Whipple, 1995; Perry & Whipple, 1981, 1982) underlie theories of "types" of female orgasm. The anatomically based typology which has drawn the most attention, clitoral vs. vaginal orgasm, is derived from Freud's (1949) theory that females must transfer the "erotogenic" zone from the clitoris to the vagina to achieve psychosexual maturity (see Sherfey, 1972, and Singer, 1973). The lack of physiological data for this typology is striking. Most of the evidence is mainly based on self-report: Orgasm attained through clitoral stimulation tended to be more localized and intense, sharper, and more satisfying physically; coital orgasm tended to be more diffuse and "whole-body" or "deeper", with throbbing feelings, and stronger, longer lasting, and more satisfying psychologically (Butler, 1976; Clifford, 1978; Fisher, 1973; Hite, 1976; Kline-Graber & Graber, 1975).

However, wide variation in reported sensations is evident (e.g., Butler, 1976). Whereas Glenn and Kaplan (1968) and Gillespie (1969) advocated identifying both the anatomical area stimulated and the perceived location of orgasm, others have concluded that strength and degree of orgasm gratification are not related to either variable (Butler, 1976; Clifford, 1978; Fisher, 1973; Leff & Israel, 1983; Myers, Kilmann, Wanlass, & Stout, 1983; cf. Latorre, 1979). In addition, clitoral stimulation appears necessary for achieving orgasm, even during intercourse; clitoral and vaginal orgasms appear biologically indistinguishable; and the relative insensitivity of the vaginal barrel makes it an unlikely erogenous zone (e.g., Fisher, 1973; Kinsey et al., 1953; Masters & Johnson, 1966; Sherfey, 1972). In one large-scale study, multiorgasmic women were more likely to report clitoral stimulation during masturbation and coitus (Darling, Davidson, Sr., & Jennings, 1991).

Another typology of female orgasm by by Singer (1973) includes the following: vulval orgasm, identified by orgasmic platform contractions and induced by coital or noncoital activity; uterine orgasm, identified by biological indices of emotion (apnea) and a lack of

orgasmic-platform contractions and induced by cervical jostling from deep coital thrusting; and blended orgasm, identified by elements of both. The validity of the typology has not yet received extensive empirical investigation. Measuring the emotional components of orgasm within the laboratory or under observation may also be difficult, as such situations may attentuate the emotional aspects of any sexual response. Whipple et al. (1996) reported that in some spinal-injured subjects, cervical stimulation resulted in heart-rate and blood-pressure changes typical of orgasm. However, whether these changes reflected orgasm, a hyperreflexic response, cognitively triggered phenomena, or some other mechanism is unclear. Other small self-report (Sholty, Ephross, Plaut, Fischman, Charnas, & Cody, 1984) and physiological-observation studies (Fox & Fox, 1969) show evidence for the typology, but subjects in other laboratory-observation studies (Alzate, 1985; Alzate & Londoño, 1984; Hoch, 1980) did not report erotic sensitivity with cervical stimulation.

Comparison of sexual outcomes with total (uterus and cervix removed) versus subtotal (cervix left intact) hysterectomy is of interest because preservation versus excision of the cervix may provide a further test of Singer's (1973) typology. Retrospective studies of total hysterectomy have found lower post-operative orgasmic capacity (e.g., Bellerose & Binik, 1993; Bernhard, 1992; Nathorst-Böös & von Schoultz, 1992; Singer, 1973; Zussman, Zussman, Sunley, & Bjornson, 1981), but prospective studies have found insignificant differences between pre- and post-operative orgasm functioning (Virtanen et al., 1993; Zussman et al., 1981). These findings, though, are based on comparisons with pre-operative rather than pre-morbid orgasm functioning. In a nonrandomized prospective study of 212 patients undergoing total or subtotal hysterectomy procedures, Kilkku, Grönroos, Hirvonen, and Rauramo (1983) did note higher post-operative orgasm frequency in the subtotal group but attributed this finding to age-related effects. The lack of control of oophorectomy status in many studies further makes findings difficult to interpret.

Other Triggering Mechanisms

Based on animal studies and laboratory studies with spinal-injured women, Komisaruk and Whipple (1995) suggested that the vagus nerve provides another pathway for afferent vaginal/cervical feedback to trigger female orgasm. Reports exist of orgasm triggered through breast stimulation alone (e.g., Masters & Johnson, 1966), imagery alone (Whipple, Ogden, & Komisaruk, 1992), and, in spinal injury, stimulation of erogenous zones above the injury (Bérard, 1989; Whipple et al., 1996). Stimulation of the pubococcygeus (PC) muscles (Kegel, 1952; Kline-Graber & Graber, 1975) has also been investigated. In a correlational study of 281 anorgasmic, coitally-anorgasmic only, and orgasmic women, the orgasmic group showed the highest sustained PC muscle strength (Graber & Kline-Graber, 1979), suggesting that PC-muscle condition is important in female orgasm. Causal direction is uncertain, however, and findings on the effect of Kegel exercises refute this conclusion (Chambless et al., 1982; Chambless et al., 1984; Freese & Levitt, 1984; Roughan & Kunst, 1981; Sultan & Chambless, 1982; Trudel & Saint-Laurent, 1983), though many of these studies themselves were not well controlled. Even if Kegel exercises reliably increased orgasm functioning in normal or clinical samples, whether the effect could be attributed, for example, to stronger PC muscles, improved urinary continence and reduced fear of urinary leakage during orgasm, or some other mechanism needs to be ascertained.

The Grafenberg Spot (G-Spot) and female ejaculation. The G-spot was first described in 1672 by a Dutch physician, Regnier de Graaf (cited in Sevely & Bennett, 1978), and then by Grafenberg (1950) as an erogenous zone on the anterior vaginal wall that expelled urethral ejaculate at orgasm. Only since the late 1970's has any empirical attention been directed to the G-spot and female ejaculation (see Alzate & Hoch, 1986; Belzer, 1984; Ladas et al., 1982; Sevely & Bennett, 1978; Zaviacic & Whipple, 1993 for reviews). Glandular structures varying in development and appearance, Skene's paraurethral glands , have been found surrounding the urethra and are believed to be prostatic homologues (e.g., Sevely & Bennett, 1978; Tepper, Jagirdar, Heath, & Geller, 1984; Zaviacic & Whipple, 1993), though

Bancroft (1989) noted similar structures around the male urethra as well. Prostatic acid phosphatase (PAP) and prostatic specific antigen (PSA), two markers of prostatic tissue, have been found in samples of urethral tissue (Dodson, Cliby, Keeney, Peterson, & Podratz, 1994; Dodson, Cliby, Pettavel, Keeney, & Podratz, 1995; Pollen & Dreilinger, 1984; Sloboda, Zaviacic, Jakubovsky, Hammar, & Johnsen, 1998; Tepper et al., 1984; Zaviacic, 1985; Zaviacic, Sidlo, & Borovsky, 1993). However, only in two studies (Pollen & Dreilinger, 1984; Zaviacic, 1985) was prostatic tissue included for comparison, and none of the other studies included comparative samples included any from males. PAP and PSA are also not specific to prostatic tissue but have been found in tissue such as breast, ovarian, and pancreatic cells (Sloboda et al., 1998; Zaviacic & Ablin, 1998).

In self-reports and laboratory observations, about 66% of subjects reported an erotically sensitive area around the 11:00-1:00 position of the anterior vaginal wall (e.g., Davidson, Sr., Darling, & Conway-Welch, 1989; Hoch, 1980, 1986; Perry & Whipple, 1982; Weijmar Schultz, van de Wiel, Klatter, Sturm, & Nauta, 1989). Swelling of this area occurs with stimulation (Addiego, Belzer, Jr., Comolli, Moger, Perry, & Whipple, 1981; Goldberg et al., 1983); continued stimulation triggers orgasm (e.g., Alzate, 1985; Alzate & Londoño, 1984) possibly via the pelvic nervous pathway (Perry & Whipple, 1982). While some noted noted concurrent urethral ejaculation (Bullough et al., 1984; Darling, Davidson, Sr., & Conway-Welch, 1990; Zaviacic et al., 1984), the G-spot, Skene's glands, and female ejaculation are not necessarily linked (Addiego et al., 1981; Bullough et al., 1984; Zaviacic & Whipple, 1993). Ann (1997) also described an area in the inner half of the anterior vaginal wall, the anterior fornix erogenous zone (the AFE zone), producing vasocongestive and orgasmic responses with stimulation, but whether it is distinct from the putative G-spot requires further controlled study.

Self-reported appearance (Darling et al., 1990; Davidson, Sr. et al., 1989) and laboratory observation of female ejaculate (Goldberg et al., 1983) indicate wide variation. In comparing ejaculate and urine samples self-collected by subjects, Belzer, Whipple, and

Moger (1984) noted that levels of tartrate-inhibited acid phosphatase and glucose (found in male ejaculate) were higher, whereas urea and creatine (found in urine) were lower in ejaculate samples. In another laboratory-observation study of a single female subject, fluid collected during orgasm also differed biochemically from urine (Addiego et al., 1981). However, self-collected samples in Belzer et al.'s study may have been contamination with partner's semen; Goldberg et al. (1983) found no differences with samples obtained in-laboratory. Standardized procedures for collecting samples without contamination have yet to be developed, and differences between ejaculate samples and vaginal secretions have not been assessed. Biochemical comparisons to male ejaculate as a requisite for validity, the relationship between the G-spot and female ejaculation, and differences between G-spot orgasm and more typically attained orgasm also need to be further addressed.

Psychologically Based Typologies of Orgasm

Levin (1981) believed that variation in orgasm can be due to psychological differences, but possible psychological typologies of orgasm have not been explored to any great extent. Some of Hite's (1976) female subjects reported emotional orgasm, a coitally attained orgasm characterized by an intense emotional peak and feelings of closeness, yearning, or exaltation. The resemblance to Singer's (1973) concept of uterine orgasm in terms of the emotional component is notable. Bentler and his colleagues found evidence involving two (Bentler & Peeler, Jr., 1979) and later three dimensions (Newcomb & Bentler, 1983) of female orgasmic responsiveness: masturbatory, partner-present/non-coital, and coital. These dimensions are influenced by psychological variables like attitudes towards masturbation, extraversion, and neuroticism. This typology is limited to heterosexual activities in which women experience orgasm.

Evidence for Different Types of Male Orgasm

The little uncontrolled self-report data available on male orgasm suggest typologies comparable to the clitoral-vaginal distinction and independent of ejaculatory sensations. Hite's (1981) subjects indicated that while masturbatory orgasm was more intense and

localized, coital orgasm was more pleasurable and satisfying. Some subjects also reported intense, pleasurable "dry" orgasms without ejaculation; conversely, ejaculation alone is not necessarily pleasurable (Hite, 1981; Kinsey, 1948), as evidenced by what is referred to clinically as anhedonic ejaculation (Garippa, 1994; Williams, 1985). Other reports described orgasm from anal penetration or prostate massage as generally "deeper," more global and intense, longer lasting, and associated with feelings of ecstasy (Hite, 1981, pp. 439, 537).

Discussion of Differences in the Orgasm Response

Currently, attempts to account for differences in the orgasm response have taken a categorical, anatomically based approach that we believe is limited. The focus on genitopelvic triggers (e.g., clitoris vs. vagina) implies, for example, that female orgasm is solely a physiological event mechanistically dependent on stimulation of genitopelvic parts and that "clitoral" vs. "vaginal" orgasms are very different entities. This approach also tells little about characteristics of the orgasm experience itself. Much of the available evidence for the validity of these typologies involves self-reports without concurrent, corroborating physiological measures. Admittedly, psychological and especially emotional differences may be difficult to show through laboratory observation: Issues relating to volunteerism, the artificial setting of the laboratory, and achievement of orgasm under such conditions limit representativeness of observed behaviours.

Previous research cited suggests that variation in subjective experience may be associated with many physical, psychological, and psychosocial variables. Clearly, a new framework is needed to accomplish the following research needs: 1) explore the core subjective characteristics of the orgasm experience in conjunction with induction mechanisms, and 2) systematically investigate variation in these characteristics as a function of different variables.

A New Model of the Subjective Orgasm Experience

We advocate a multidimensional model of the subjective experience of orgasm as a framework for accomplishing these two needs. The concept of a "typology" is useful, but

we note one qualification: While typologies define different forms of a construct, they must also presume fundamental features of that construct that are common across the different forms. Models such as Davidson's (1980) and Warner's (1981) could portray all orgasm experiences as having qualities both unique to each "type" and collectively defining all orgasms. Alternatively, different orgasms may have the same qualities but differ in relative intensity of these qualities.

Within the pain literature, Melzack and Torgerson (1971) distinguished three universal components in a multidimensional framework of the pain experience: the sensory, evaluative, and affective. The first represents sensations arising from physical events such as cuts in the skin or neuropathology; the second, the "subjective overall intensity of the total experience"; and the third, "tension, fear, and autonomic properties that are part of the pain experience" (Melzack & Torgerson, 1971, p. 51). Each component comprise different subcomponents that can be empirically represented by particular adjectives. This model is similar to Davidson's (1980) physical-nonphysical and Warner's (1981) sensory-affective models for the subjective orgasm experience, and so we propose that it can generalize to other psychophysiological phenomena like orgasm (cf. Heiman, 1998 for application of this model to other female sexual responses). Thus, the sensory component of the orgasm experience would encompass the perception of physiological events (e.g., contractile sensations, muscle tension/release, thermal sensations). The evaluative (nonphysical) component would concern evaluations of the orgasm experience, including relatively neutral (e.g., intensity) and positive (or negative) appraisals (e.g., pleasure, satisfaction, pain). The affective (nonphysical) component would involve the positive (and negative) emotions felt during or after immediately orgasm (e.g., happiness, elation, intimacy/love). As in the pain experience, each of these components would also comprise different subcomponents. This model also measures these qualities separately from measurement of location of sensations or sexual activity and thus can provide a framework for describing any orgasm experience.

Figure 1 presents a proposed theoretical structure of examples of components, their respective subcomponents, and representative adjectives. Adjectives were collected from available self-report literature on the orgasm experience and grouped semantically to form possible subcomponents. Subcomponents were then considered to semantically represent a particular component. The model suggests that all orgasm experiences involve all three interrelated components. In explaining variation across experiences, it may thus be useful to think about subjective "typologies" of orgasm in terms of whether an experience has relatively heightened "sensory" qualities (i.e., a more "physical" orgasm) vs. "affective" qualities (i.e., a more "psychological" orgasm). Different orgasms would also differ on, for example, intensity and pleasure. We are currently conducting studies evaluating applicability of the model to both male and female orgasm.

Conclusion

Identifying a multidimensional model of the subjective orgasm experience would enable fruitful research directions within a biopsychological perspective. For example, by enabling comparative psychological and biopsychological studies between sexes and across different orgasm experiences, the multidimensional model can effectively address many of the issues evident in this review: sex differences (and similarities) in the orgasm experience; the independence of male orgasm and ejaculation; male multiple orgasm; the validity of different types of male and female orgasm; non-correspondence between objective and subjective measures of orgasm; and the covariation of different aspects of the orgasm experience with different physiological, psychological, and psychosocial variables. A standardized multidimensional questionnaire can also be utilized as a useful clinical assessment tool with populations that often report problems with orgasm. For example, knowledge about the association between particular kinds of subjective experiences and specific biological events or medical conditions may facilitate differential diagnosis based on self-report. It can also be used to investigated as a post-surgical outcome measure of changes in particular aspects of orgasm sensations.

Overall, we hope that this and similar work will encourage further research directions in the psychology of orgasm and facilitate the emergent trend towards biopsychological approaches. Useful research paradigms for further progress in psychologically driven work have already been laid. Once these avenues have been explored, more controlled biopsychological research, in conjunction with the dimensional approach to describing the orgasm experience, will hopefully allow us to go beyond merely the "full engorgement of the late plateau phase" to understanding and appreciating the "[r]ockets, earthquakes, [and] fireworks" of human orgasm.

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Table 1

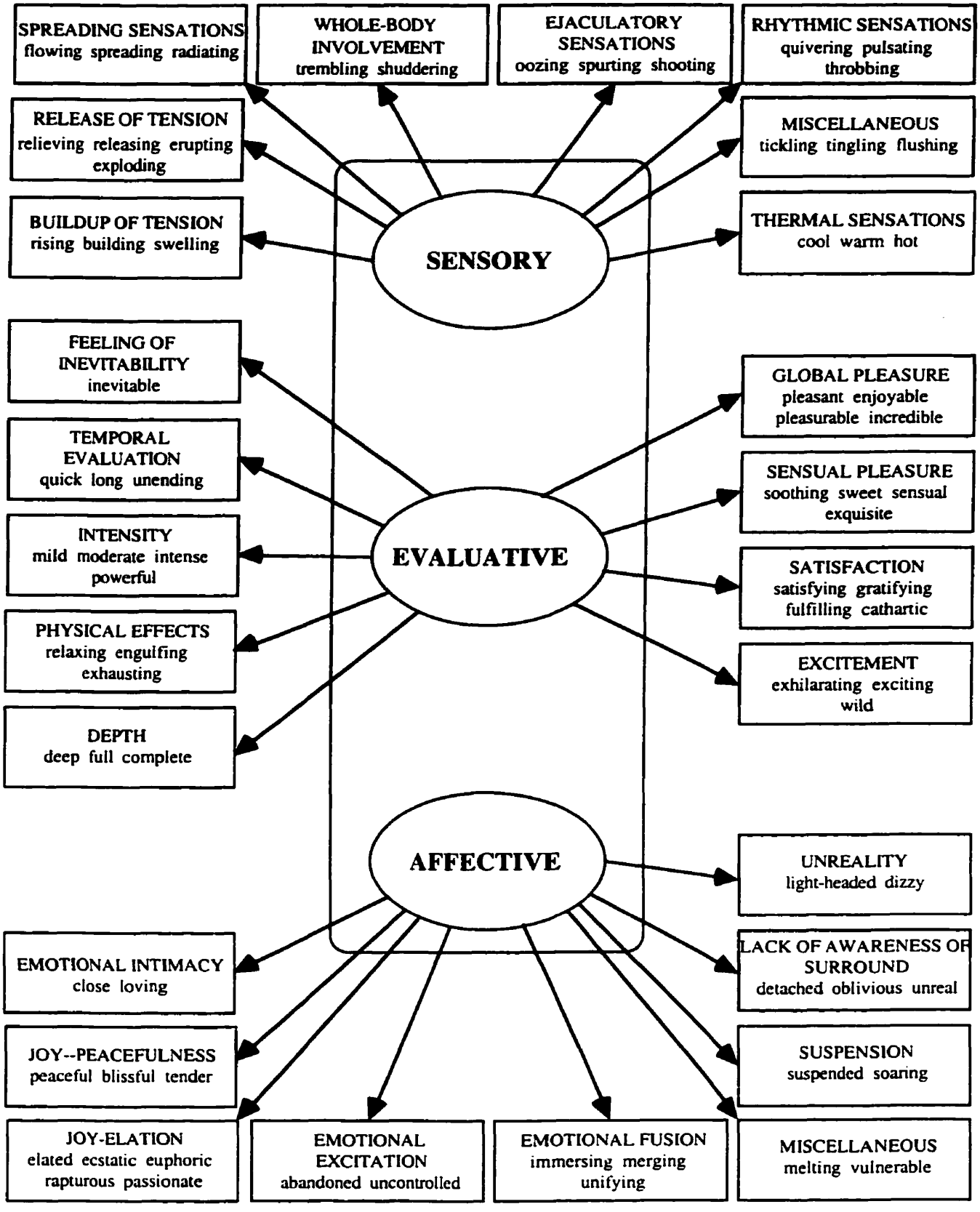
Definitions and Brief Descriptions of Orgasm Within Difference Perspectives

Researcher(s)	Definition	Sex
	Primarily Biological Perspective	
Campbell & Petersen (1953)	neurohormonal reaction of smooth muscle organs and contraction of homologues of ejaculatory muscles	female
Ellis (1938)	release of nervous forces (detumescence)	both
Fox (1977)	changes in blood pressure/respiratory rate/heart rate; changes in muscular tension/ genitopelvic contractions; hormonal changes; vocalizations	both
Glenn & Kaplan (1968)	spastic vaginal contractions occurring at highest tension level	female
Kaplan (1974)	reflexive sensory-motor response involving genitopelvic contractions	female
Kinsey et al. (1948, 1953)	explosive discharge of neuromuscular tension at the peak of sexual response	both
Kline-Graber & Graber (1975)	reflexive sensory-motor response to sexual stimulation	female
Masters & Johnson (1966)	release of vasoconcentration and myotonia from sexual stimulation	both
Mould (1980)	reflexive clonic contractions of pelvic/abdominal muscle groups	female
Reubens (1982)	involuntary reflex action accompanied by uterine/vaginal contractions	female
Sherfey (1972)	stretch-reflex release of genitopelvic muscular vasocongestion	female
	Primarily Psychological Perspective	
Alzate & Lodono (1984)	subjective perception of the most intense point in a series of increasingly pleasurable sensations elicted by sexual stimulation	female

Davidson & Davidson (1980)	altered state of consciousness	both
Newman, Reiss, & Northup (1982)	sensory expression of emission/ejaculation	male
Raboch & Bartak (1983)	subjective statement of having reached a distinct sensorial climax during intercourse	female
Singer (1973)	climactic release from tension	female
Terman (1938, 1951)	climax of intense feeling followed by quietude and relief	female
Tuckwell (1989)	pleasurable event usually associated with ejaculation	male
Wallin (1960); Wallin & Clark (1963)	climax of intense feeling followed by feeling of relief and relaxation	female
	Integrated Biopsychological Perspective	
Alzate, 1985	psychic phenomenon, a sensation (cerebral neuronal discharge) elicted by the accumulative effect on certain brain structures of appropriate stimuli originated in the peripheral erogenous zones	both
Bancroft, 1989	complex experience of genital changes, changes in skeletal muscle tone/semi-voluntary movements, cardiovascular/respiratory changes, somatic sensory experiences, altered consciousness	both
Bentler & Peeler (1979)	complex experience with emotional/ mental/physical components	female
Hite (1976, 1981)	sudden, intense sensation just prior to genitopelvic contractions	both
Reich (1973)	orgastic potency: capacity to surrender to flow of biological energy; capacity to discharge...the damned-up (sic) sexual excitation through involuntary, pleasurable convulsions of the body	both
Schiavi & Seagraves (1995)	acme of sexual pleasure...with rhythmic contraction of perineal/reproductive organs, cardiovascular and respiratory changes, release of sexual tension	both

Figure Caption

Figure 1. Theoretical three-component structure of the psychological experience of orgasm with respective subcomponents and representative adjectives.


SPREADING SENSATIONS
flowing spreading radiating
WHOLE-BODY INVOLVEMENT
trembling shuddering
EJACULATORY SENSATIONS
oozing spurting shooting
RHYTHMIC SENSATIONS
quivering pulsating throbbing
RELEASE OF TENSION
relieving releasing erupting exploding
MISCELLANEOUS
tickling tingling flushing
BUILDUP OF TENSION
rising building swelling
SENSORY
THERMAL SENSATIONS
cool warm hot
FEELING OF INEVITABILITY
inevitable
GLOBAL PLEASURE
pleasant enjoyable pleasurable incredible
TEMPORAL EVALUATION
quick long unending
SENSUAL PLEASURE
soothing sweet sensual exquisite
INTENSITY
mild moderate intense powerful
EVALUATIVE
SATISFACTION
satisfying gratifying fulfilling cathartic
PHYSICAL EFFECTS
relaxing engulfing exhausting
EXCITEMENT
exhilarating exciting wild
DEPTH
deep full complete
AFFECTIVE
UNREALITY
light-headed dizzy
EMOTIONAL INTIMACY
close loving
LACK OF AWARENESS OF SURROUND
detached oblivious unreal
JOY--PEACEFULNESS
peaceful blissful tender
SUSPENSION
suspended soaring
JOY-ELATION
elated ecstatic euphoric rapturous passionate
EMOTIONAL EXCITATION
abandoned uncontrolled
EMOTIONAL FUSION
immersing merging unifying
MISCELLANEOUS
melting vulnerable

Author Notes

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Transition Text 1

The variability observed within existing empirical and clinical reports of orgasm experiences is difficult to account for at present. While a couple of general descriptive models of the orgasm experience exist, there is at present no widely held organizing framework by which to understand different constructs inherent to the orgasm experience. Instead, orgasm is often investigated in essentially an "all-or-nothing" manner in which, for example, individuals are asked to indicate global intensity, satisfaction, or frequency of their orgasm responses. Typologies of female orgasm suggest that all orgasm experiences of one type are qualitatively identical--a reflection of the physiological reductionist perspective that remains pervasive within the literature. There has been little consideration of the potential for human orgasm to encompass different components that intertwine to generate a particular orgasm experience but that may each independently vary. Even the relationships among these components may themselves change as a function of different biological, psychological, and/or psychosocial factors. Physiological studies have contributed a crucial foundation of knowledge and theory, and thus refinement of physiological work should continue. However, an essential component must involve comprehensive investigation of the specific qualities of the subjective orgasm experience to understand human orgasm as a biopsychological phenomenon.

A further vacuum within the literature has been research comparing the psychological experiences of male and female orgasm. Psychological (via central nervous system involvement) and psychosocial as well as physiological factors confer erotic potential in both male and female orgasm. Yet empirical work has tended to reflect a sociocultural, a priori emphasis on differences between the two responses: Whereas male orgasm has been relatively ignored from a psychophysiological standpoint and is typically still viewed as a unitary response equated with ejaculation, female orgasm has been invested with a multi-dimensional potential physiologically and psychologically. Although male and female

orgasm may be distinct because of physiology, what little controlled (e.g., Vance & Wagner, 1976) and uncontrolled evidence exists (e.g., Hite, 1976, 1981) suggests relative homogeneity with a few differences rather than heterogeneity with a few similarities.

The following research in this thesis was developed to examine these issues by evaluating the three-dimensional model outlined in the review paper.

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Running Head: PSYCHOLOGICAL MODEL OF ORGASM

Evaluating a Three-Dimensional Qualitative Model of the Psychological Experience of Orgasm Across Sex and Sexual Context

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Abstract

Human orgasm remains the most poorly understood of the sexual responses. There is much controversy concerning whether there is a core set of characteristics common to all orgasm experiences and whether sex and situational differences result in qualitatively different orgasm experiences. A three-dimensional descriptive model encompassing sensory, evaluative, and affective dimensions, each with their respective components, was developed to address the following hypotheses: 1) The pattern of adjective ratings conveying orgasm experiences can be characterized by a three-dimensional model with sensory (e.g., contractile sensations, muscle-tensing sensations), evaluative (e.g., intensity, pleasure, satisfaction) and affective components (e.g., ecstasy, intimacy/love); 2) this three-dimensional model will adequately characterize both male and female orgasm experiences, suggesting they are similar; and 3) adjective ratings will display context-dependent differences, in that orgasm attained through sex with a partner will be associated with higher ratings on the affective and evaluative components than orgasm attained through solitary masturbation. Eight hundred and eighty-eight undergraduate and graduate students (523 females) provided adjective ratings to convey actual orgasm experiences attained through solitary masturbation and sex with a partner. Results of confirmatory factor analyses provided evidence that the hypothesized three-dimensional model adequately described the experience of both male and female orgasm while at the same time indicated some sex differences. Predicted differences in evaluative and affective components as a function of sexual context in which orgasm was attained were also observed.

EVALUATING A THREE-DIMENSIONAL QUALITATIVE MODEL OF THE PSYCHOLOGICAL EXPERIENCE OF ORGASM ACROSS SEX AND SEXUAL CONTEXT

Orgasm is the most poorly understood of human sexual responses (Bancroft, 1989; Rosen & Beck, 1988). Whereas a large body of biological research exists investigating orgasm as a physiological response to stimulation, until recently, few studies have investigated orgasm as a sexual experience with psychologically erotic, pleasurable qualities as well as physiological events. This is surprising as some have argued that cognitive-subjective awareness and labelling is necessary to imbue the physiological response of orgasm with qualitatively "sexual" properties (e.g., Rosen & Beck, 1988). In our view, three major issues have yet to be thoroughly addressed from a psychological perspective: 1) identifying the qualitative characteristics common to all orgasms; 2) characterizing qualitative variability across different orgasm experiences; and 3) characterizing and comparing male and female orgasm.

Characterizing the Orgasm Experience

Studies of orgasm, almost exclusively with female samples, have investigated numerous experiential variables: latency, intensity and pervasiveness, duration, quality, receptivity and anticipation level, release of tension, degree of post-orgasmic exhaustion, and amount of body heat (e.g., Fisher, 1973; Sholty et al.,1984). Post-orgasm feelings include happiness, love, relaxation, and satisfaction (Fisher, 1973; Hite, 1976). Few efforts have been made to organize these characteristics within a descriptive framework, and the psychological models that exist vary in the importance given to subjective events. Masters and Johnson's (1966) description of the psychological progression of orgasm relates primarily to genitopelvic changes. Their findings were also based on subjects' anecdotal reports of orgasm achieved under close laboratory scrutiny; important qualities like affective experiences may have been attenuated under these conditions.

In contrast, Davidson (1980) conceptualized orgasm as an altered state of consciousness (ASC) encompassing the following: exteroceptive/interoceptive changes, alterations in sense of space, time, and identity, strong emotions, and motor-output changes (Davidson & Davidson, 1980, p. 292). Findings consistent with ASC experiences have been noted (Fisher, 1973; Hite, 1976). Davidson further proposed a theoretical multidimensional model distinguishing between the sensations of physiological events (e.g., generalized and localized muscular sensations) and mood changes distinct from physiological events (e.g., release of tension; euphoria; and the ASC). In an unpublished dissertation study of female orgasm, Warner (1981) found evidence for a similar classification with physical and affective dimensions. Six subscales for the physical dimension ("Release", "Throbbing", "Continued Arousal", "Vaginal Sensation", "Sudden Cessation", "Non-Genital") and four subscales for the affective dimension ("Evaluative", "Depressed", "Unresponsive", "Almost") were found through exploratory factor analyses. The three latter affective subscales may be attributed to Warner's asking research participants to rate their peak arousal, which may or may not have included orgasm.

Davidson's (1980) and Warner's (1981) models, along with individual findings from studies of the different characteristics of orgasm, suggest that the sexual experience of orgasm involves at least three dimensions: sensations related to physiological events, cognitive-evaluative components, and mood/emotional changes. These qualitatively distinct dimensions call for a multidimensional framework with which to both describe each dimension adequately and recognize their interdependent nature. Other psychophysiological phenomena, such as pain, have been similarly described using a multidimensional approach involving sensory, evaluative, and affective components (e.g., Melzack & Torgerson, 1971).

Variability in the Orgasm Response

In addition to characterizing the orgasm experience, a multidimensional model also may prove useful in explaining reported variability. Current approaches have involved biologically based typologies and the classification of different "types" of primarily female

orgasm. The distinction between clitoral and vaginal orgasm has drawn the most attention. Most of the evidence for this typology involves self-report: Clitorally induced orgasm has been described as more localized, more intense, and more physically satisfying; coital orgasm, more diffuse and "whole-body," stronger, and more satisfying psychologically (e.g., Clifford, 1978; Fisher, 1973; Hite, 1976). This has not been a consistent finding (e.g., Butler, 1976), and some researchers have concluded that orgasm gratification is not related to anatomical area of stimulation (e.g., Fisher, 1973).

Levin (1981) maintained that variability in the orgasm response may be more evident at the psychological level. Using confirmatory factor analysis of self-report data, Newcomb and Bentler (1983) found evidence for a typology of female orgasmic responsiveness with three dimensions: masturbatory, partner-present/non-coital, and coital. While they believed that the typology adequately modeled individual differences in reported female orgasm experiences, the investigators also found evidence for a second-order general orgasmic responsiveness factor which they offered as evidence for the unitary physiological nature of orgasm. The study, however, relates more to sexual behavioural/contextual factors underlying differences in orgasmic responsiveness rather than the psychological qualities of orgasm per se.

Two problems are noted with current typologies. First, while typologies identify purportedly different forms of a particular concept, they should also outline essential features common to the different forms, i.e., characteristics that define "orgasm" and which all orgasm experiences share. Second, current typologies confound description of variability with causal explanation by emphasizing conditions (e.g., genitopelvic triggers) associated with the occurrence of orgasm. This does little to characterize the orgasm experience itself. Descriptive model like those of Davidson (1980) and Warner (1981) instead can portray variability in terms of, for example, whether an orgasm experience is more physically versus psychologically intense.

Sex Differences in the Orgasm Experience

There is controversy concerning whether male and female orgasms are similar. Female orgasm is typically believed to be psychologically more complex than male orgasm: "[There is] great variation in both the intensity and duration of female orgasmic experience, while the male tends to follow standard patterns of ejaculation reaction with less individual variation" (Masters & Johnson, 1966, p. 6). Thus, while female orgasm "...remains a potpourri of psychophysiological conditions and social influence" (Masters & Johnson, 1966, p. 133), very little research exists on the psychological experience of male orgasm. Instead, the reductionist view of male orgasm is reflected in the large amount of literature available on male ejaculation.

However, male orgasm appears to be not only more complex than sensations arising from ejaculatory processes but more similar to female orgasm than suspected. In Vance and Wagner's (1976) study, medical students, obstetrician-gynecologists, and psychologists asked to differentiate written descriptions of orgasm experiences on the basis of sex of the writer were unable to do so beyond chance. Furthermore, the scant, uncontrolled data available on the psychology of male orgasm seem comparable to those reported in some studies of typologies of female orgasm (Hite, 1981; Kinsey, Pomeroy, & Martin, 1948). While "dry" orgasms without ejaculation were reportedly pleasurable, ejaculation alone was not (Hite, 1981; Kinsey et al., 1948). Unfortunately, Hite's (1976, 1981) work consisted of anecdotal reports and did not directly compare male and female experiences. As both male and female orgasms are erotically pleasurable, the multidimensional model should apply to both male and female orgasm experiences.

The Current Study

The major purpose of this study was to evaluate a multidimensional model derived from adjective ratings of participants' orgasm experiences. Adjectives (e.g., "throbbing") rather than descriptive sentences (e.g., "I feel a throbbing sensation in my vagina") were used to measure qualitative aspects of the orgasm experience so as not to denote any

physiological, situational, or behavioural cues. Endorsement of an item may otherwise depend not on how well it describes orgasm per se, but on consideration of such cues in the item; the example given of a descriptive sentence, "I feel a throbbing sensation in my vagina", might not be endorsed if there were a throbbing sensation in an area other than the vagina.

A theoretical descriptive model using adjectives was initially developed by the first author to represent potentially important components in the psychological experience of orgasm. Adjectives descriptive of orgasm were grouped by similarity of definition to form individual components. Each component was then assigned a tentative label to reflect the concept conveyed by its adjectives. This model was then used to guide the development of statistically best-fitting components for hypothesis testing by providing a structure against which the latter could be compared for conceptual coherence. Each of the components was also classified under one of the three higher-order, interrelated dimensions (sensory, evaluative, or affective) to which semantically it was thought to primarily belong. The term "component" will be used hereafter to refer to a theoretical construct reflected by particular adjectives, whereas "dimension" will refer to a general construct reflected by particular components. This model, referred to as the "theoretical model", is shown in Table 1.

Three hypotheses are evaluated. First, the pattern of adjective ratings conveying orgasm experiences can be characterized by a multidimensional model with sensory (e.g., contractile sensations, muscle-tensing sensations), evaluative (e.g., intensity, pleasure, satisfaction) and affective dimensions (e.g., ecstasy, intimacy/love). Second, this three-dimensional model will adequately characterize both male and female orgasm experiences, thereby suggesting they are similar. Third, adjective ratings will display context-dependent differences: Orgasm attained through sex with a partner will be associated with higher ratings on the affective and evaluative components than orgasm attained through solitary

masturbation. Two studies comprising separate samples were carried out: 1) a questionnaire-development and pilot study; and 2) the main study involving model evaluation.

Method

Participants

In the pilot study, 48 male and 41 female undergraduate and graduate students recruited from a local university volunteered to complete questionnaires. In the main study, participants were undergraduate and graduate students from two local universities, and, using ads posted with owners' permission, through email LISTSERVs likely to have student members. Inclusion criteria involved having experienced orgasm at least once during solitary masturbation and at least once during sex with a partner and having fewer than 25% missing ratings in both sets of adjective ratings participants completed. A sample of 523 women and 365 men, including 104 women (20%) and 85 men (23%) recruited from the LISTSERVs, met this criterion for the main study. Table 2 lists the characteristics of the sample. The majority were young, unmarried, heterosexual undergraduate students.

University participants in the main study were provided with two kinds of incentives: Those recruited from classes participated in a cash lottery, while those recruited through the subject pool received partial course credit. All participants were assured of anonymity and confidentiality of responses.

Materials

Pilot study: questionnaire development. A list of 104 adjectives was initially compiled informally from the available self-report literature on the orgasm experience (e.g., Bentler & Peeler, Jr., 1978; Clifford, 1978; Hite, 1976, 1981; Masters & Johnson, 1966; Newcomb & Bentler, 1983; Vance & Wagner, 1976). Additional adjectives from the McGill-Melzack Pain Questionnaire (Melzack, 1975) were added to investigate the possibility that orgasm may

involve negative or painful experiences in healthy subjects as it sometimes does in clinical populations with peripheral neuropathy or neuromuscular pathology. This resulted in an initial pool of 142 adjectives.

An initial adjective-ratings questionnaire was developed and piloted with identical forms for the two sexual contexts (solitary masturbation, sex with partner). Individuals were asked to rate each adjective on a 0-9 scale (0 = "does not describe it at all", 9 = "describes it perfectly") according to how well it described their most recent orgasm. In both forms, the adjectives were in the same order, and the solitary-masturbation form was completed first. The questionnaires were distributed in a small number of undergraduate and graduate university classes. Mean adjective ratings from the 89 pilot participants' responses were examined across the sex and sexual context conditions, and the 50 highest-rated adjectives for each condition were retained that included both adjectives common to all conditions and unique to particular conditions. Highly negative adjectives from the McGill-Melzack Pain Questionnaire (Melzack, 1975) were notably dropped with this procedure, though the adjective "painful" was nonetheless retained for further theoretical purposes. A final pool of 60 adjectives was thereby derived for the current study.

For the main study, a smaller rating scale of 0-5 was used because pilot participants reported difficulty providing ratings with the 0-9 scale. The form for the sex with a partner condition also included a section for participants to indicate how orgasm was achieved (vaginal or anal intercourse, oral or manual stimulation from partner, manual stimulation from self, other.

Statistical Procedure

The following analyses were conducted on data obtained for the main study. Prior to analyses, missing values in participants' adjective ratings were replaced using the mean adjective rating for the sex of participant by sexual context with which the particular adjective was associated.

Model development. Principal components analysis (PCA) with varimax rotation, using SPSS for Windows (version 8), was initially employed 1) to obtain statistically based components for hypothesis testing, and 2) to reduce the number of adjectives due to a number of participants still reporting difficulty with rating 60 adjectives. Because sexual context was a within-subjects variable, the correlation matrix analyzed included adjectives from both sexual contexts. Separate PCAs were conducted for each sex. Factors were extracted until the cumulative proportion of variance explained was at least 75%, and components made conceptual sense according to the theoretical model. Components were retained only if they contained more than either a single item or single adjective from both sexual contexts. To reduce the number of adjectives, only up to three adjectives (or both adjectives if a component had only two different adjectives loading onto it) were selected; in components with matching adjectives from both sexual contexts, only matching adjectives were kept. Items with loadings $\geq .40$ were considered for inclusion.

Reliability analyses included assessment of the internal consistency of the reduced adjective pool with Cronbach's alpha. A second PCA as well as maximum likelihood factor analysis of the reduced adjective pool was also conducted, both with varimax rotation and extracting the same number of components obtained for each sex from the first PCA. Components were then collapsed between sexes by grouping 1) components with the same adjectives, and 2) components judged by the investigator to reflect highly similar concepts but without necessarily all the same adjectives. The theoretical model was used to allocate each of the final components to one of the three dimensions, forming the baseline model for hypothesis testing.

Hypothesis testing. Confirmatory factor analysis (CFA) with maximum likelihood estimation was conducted using EQS for Windows (version 5.6). Several steps were taken to evaluate initial fit of the baseline model for each sex, examining the measurement and structural models separately (Bentler, 1995; Byrne, Shavelson, & Muthén, 1989; Jöreskog, 1971; Marsh & Hocevar, 1985). Indices of model fit examined were the ratio of $\chi 2$ (Satorra-

Bentler scaled for nonnormal data) to degrees of freedom, the goodness of fit index (GFI), the non-normed fit index (NNFI), the incremental fit index (IFI), and the comparative fit index (CFI, Satorra-Bentler scaled for nonnormal data). These particular indices have been recommended for relative reliability against sample size effects and against violations of multivariate normality and independence of latent variables (Hoyle & Panter, 1995; Hu & Bentler, 1995). The higher the fit index values and lower the $\chi 2$/df ratio, the better the model fit is considered to be. Criteria adopted to indicate adequate model fit were fit index values $\geq$ .80 and $\chi 2$/df ratio < 3.00. These are more liberal than the traditionally recommended criteria of fit index values $\geq .90$ and $\chi 2$/df ratio < 2.00 (e.g., Bentler, 1995; see Discussion). Modifications were added based on the multivariate Lagrange Multiplier (LM) test and on theoretical/methodological considerations; only modifications associated with a significant $\chi 2 > 3.84$ ($p < .05$), were considered for inclusion.

Simultaneous CFA was then conducted to test equality of the model's factor structure between sexes, i.e., that the underlying components, dimensions, and their interrelationships are essentially the same for men and women. Different sets of free parameters, except the model modifications made for each sex, were sequentially constrained to be equal between sexes according to a series of nested tests (Bentler, 1995). The same fit indices were examined without corrections for nonnormality, as Satorra-Bentler corrections are unavailable with simultaneous CFA in the version of EQS used. At each test, a multivariate Lagrange Multiplier (LM) test of constraints was performed, and constrained parameters with an associated change in $\chi 2 > 3.84$ ($p < .05$) were released to vary between sexes.

Differences in components between sex and sexual context. For each component in the model, simple scale scores were created by summing ratings of its respective adjectives with unit weighting. To compare the difference between scale scores for single-context components with matching adjectives, a 2 x 2 (Sex x Sexual Context) mixed MANCOVA using SPSS for Windows (version 6) was performed with scale scores as the DVs. To

compare the sex differences between scale scores for the remaining components with matching adjectives from both contexts, a one-way (Sex) MANCOVA was performed.

Results

Adjective or component names hereafter will include either a "1" if the particular item refers to the solitary masturbation context (e.g., "pleasurable1" refers to a rating for the adjective "pleasurable" to describe orgasm attained through solitary masturbation) or a "2" if the item refers to the sex with partner context. Component names without a number refer to components that include adjectives from both sexual contexts (e.g., "Relaxation" includes "peaceful1" and "peaceful2").

Characteristics of Orgasm Experiences Reported

The majority of subjects (67% of women and 86% of men for solitary masturbation context, 54% of women and 61% of men for sex with partner context) experienced their orgasm within 10 days of completing the questionnaire. The majority of subjects (67% of women and 75% of men for solitary masturbation context, 53% of women and 55% of men for sex with partner context) also reported a duration of orgasm of 10 seconds or less. Orgasm through intercourse alone was reported by 34% of women but by 70% of men. Women instead reported achieving orgasm primarily through manual (22%) or oral stimulation (21%), as well as through other means including intercourse with concurrent manual stimulation from self (4%) or partner (4%). Next to intercourse, men reported achieving orgasm through oral (13%) and manual stimulation from partner (8%); other ways reported included concurrent oral and manual stimulation from partner (1%).

In looking at the adjective ratings, univariate skewness and kurtosis for most adjective ratings were > 2.00 for both men and women. Some adjectives, though, did display significant skewness (women: "close1" = 2.15, "pleasurable2" = -2.27) or kurtosis (women: "close1" = 4.09, "pleasurable2" = 6.60, "satisfying2" = 3.03, "fulfilling2" = 2.58;

men: "close1" = 3.08, "pleasurable2" = 4.33, "satisfying2" = 2.09) in expected directions. Multivariate kurtosis was also evident for both men (normalized estimate = 35.96) and women (normalized estimate = 62.17).

Statistical Components and Reliability

In the initial PCA, the first 11 of 42 components extracted from the female participants' data and the first 8 of 41 components from male participants' data had more than one adjective (or more than a single adjective from both sexual contexts) loading onto them and so were kept. These components and respective item loadings are listed in Table 3. For both sexes, five components had adjectives from one sexual context: two components with solitary masturbation adjectives only, three with sex with partner adjectives only. The number of components with matching adjectives from both sexual contexts was six for women and three for men. Table 3 also indicates adjectives retained for subsequent analyses in bold. In the first component for both sexes, adjectives conveying pleasurable satisfaction were kept ("satisfying", "pleasurable", "fulfilling") whereas those conveying intensity (e.g., "exciting", "intense") were disregarded to gain a more homogeneous component.

Reliability of adjectives and components for each sex. Internal consistency of the reduced adjective pool for each sex, using Cronbach's alpha, was high (women: $\alpha = .92$; men: $\alpha = .90$). Furthermore, when a second PCA of the bold-printed adjectives from Table 3 was conducted, extracting 11 components for women and 8 for men as from the first PCA, the resulting components, shown in Table 4 within the first column under each sex, were identical to those in Table 2, suggesting reliability of the components. As apparent in Table 4, the same adjectives from the two contexts also often loaded either onto separate components forming identical constructs between contexts (e.g., PCA components 7 and 9 for women, 4 and 5 for men) or onto the same component (e.g., PCA components 1 for both sexes).

In addition, Table 4 compares the rotated factors from maximum likelihood factor analysis (MLFA; second column under each sex) to the PCA components. Stability of the

components was observed, in that the factors were identical to the components, though with smaller item loadings. Table 5 provides factor-score covariance matrices, obtained from estimated regression factor scores through MLFA. In the diagonal, the squared multiple correlations of factor scores predicted from observed variable scores (in bold) provide estimates of the factors' internal consistency. The large values (≥ .70; Tabachnick & Fidell, 1996) found in most cases indicate good internal consistency of factor scores.

Hypothesis Testing

Pooling of same/similar components between sexes resulted in a total of 12 components forming the baseline model (five with adjectives from one sexual context, seven with adjectives from both contexts). Figure 2 indicates the label accorded to each component to reflect the construct suggested by its respective adjectives. Homologous versions of two components, Pleasurable Satisfaction and Emotional Intimacy, appeared within both the solitary masturbation (Pleasurable Satisfaction1, Emotional Intimacy1) and sex with partner conditions (Pleasurable Satisfaction2, Emotional Intimacy2).

Individual model fit and parameter stability after modifications. Table 6 summarizes the steps (models 1-11) taken in fitting the baseline model for each sex. The 12 components forming the measurement model of the baseline model were analyzed and modified first (models 1-7), followed by the three-dimensional structural model (models 8-11).

The large $\chi 2/df$ ratios for the independence model (all adjectives uncorrelated; model 0) suggest that it could be rejected. CFA of the measurement model (12 components allowed to covary; model 1) indicated adequate model fit according to criteria and significant improvement over the independence model. While $\chi 2/df$ ratios were better for the male group, slightly better fit values were noted for the female group. Post-hoc multivariate Lagrange Multiplier (LM) modifications were added to improve fit further. Almost all modifications for each sex involved significant nonzero correlations between error variances expected to share nonrandom measurement error (models 2-7 for female group, models 2-6 for male group; cf. Byrne et al., 1989). For the male group, the additional secondary loading

of "soothing1" onto the component, "Pleasurable Satisfaction1" (model 7), could reflect ejaculatory sensations (e.g., Hite, 1981). For all modifications, $\chi 2$-difference tests were highly significant, $ps < .001$, but fit indices increased only slightly.

When the three-dimensional structural model was added, a slight reduction in fit was noted (model 8). The Evaluative and Affective dimensions were also overly correlated for both sexes, and so modifications were added to rectify this. The first LM-based modification for each sex (model 9) did not resolve the problem, and so more theoretically based modifications were applied. As greater psychological satisfaction may be associated with orgasm attained through activities with presumably greater emotional arousal, such as coitus (e.g., Clifford, 1978; Fisher, 1973; Hite, 1976, 1981), the following two parameters were sequentially added for both sexes: The disturbance (i.e., unique variance) for Pleasurable Satisfaction2 and then for Relaxation were allowed to correlate with that of Emotional Intimacy2 (models 10 and 11, respectively, for both sexes). Both parameters were significant at $p < .01$ for both sexes and seemed to have overlapping variance. However, only adding the the second parameter resulted in significant change in $\chi 2$ for both sexes and resolution of the Evaluative-Affective overcorrelation. The majority of fit indices ranged from .82-.85 for women and .80-.84 for men; for both sexes, the GFI was substantially lower (.77 for women, .74 for men).

Further theoretically and methodologically based modifications were then added to improve fit indices. First, measuring sexual context as a within-subjects variable may have produced correlations between similar parameters across context. Modifications made during baseline fitting of the measurement model mostly involved correlations between the same adjectives between sexual context (e.g., see Table 6, models 1-7 for women), thus supporting this hypothesis. Thus, additional modifications were added to reflect sexual-context effects; these are listed in Table 6, models 12A-B and 13A-C. With the General Spasms and Relaxation components, which comprised matching adjectives from both contexts, the solitary masturbation adjectives were loaded onto a separate subcomponent,

labelled General Spasms1 and Relaxation 1. Each subcomponent in turn loaded onto the main component (models 12A-B). Next, the unique variances (disturbances) for the components were allowed to covary according to the sexual context with which they were associated. For example, Pleasurable Satisfaction1 was allowed to covary with Relaxation1, Relaxation1 was allowed to covary with Emotional Intimacy1, and Pleasurable Satisfaction2 was allowed to covary with Ecstasy2 (models 13A). These modifications are similar to those of models 10-11 in Table 6, involving correlations between Emotional Intimacy2 and Pleasurable Satisfaction2 and Relaxation. Finally, two sets of unique variances (errors) for each adjective were allowed to covary: 1) the same adjectives between contexts (model 13B), and 2) similar adjectives within context (model 13C). In all cases, all parameter coefficients were significant at $p < .05$ or less, the $\chi 2$/df ratios dropped, and fit indices improved. One parameter for each sex became nonsignificant: for the women, the correlation the error variances for peaceful1 and soothing1; for the men, the loading of soothing1 onto Pleasurable Satisfaction1. The final model (model 13C) was associated with a $\chi 2$/df ratio = 1.88 and fit indices ranging from .82-.90 for women, and $\chi 2$/df ratio = 1.75 and fit indices from .79-.89 for men; again, the GFI showed the lowest values. The average standardized residuals for both men and women was .05. Figure 1 displays the final model with standardized parameter coefficients for each sex; coefficients for modifications are not in the figure but are listed beside each modification in Table 6.

Alternative models. Several alternative models were evaluated, the results of which are in Table 6 at the bottom of the section for each sex (models A-E). First, more parsimonious measurement models (models A-C) with one (one component with all adjectives), two (one with sensory-type adjectives, one with evaluative- and affective-type adjectives), and three components (separate ones with sensory-, evaluative-, and affective-type adjectives) were compared to the 12-component model (model 1). The alternative models had comparatively higher $\chi 2$/df ratios and lower fit indices, suggesting the 12-component model was the better fitting model for both sexes.

Second, because of the overcorrelation between the Evaluative and Affective dimensions, alternative structural models (models D-E) with one (all 12 components loading onto one dimension) and two dimensions (Sensory and combined Evaluative-Affective dimensions) were compared to the three-dimensional model. Most of the $\chi 2$/df ratios and fit indices for both alternative models were within criteria, and so both models may be considered plausible models. The two-dimensional model was a significant improvement over the one-dimensional model. The three-dimensional model demonstrated slightly lower $\chi 2$/df ratios compared to the two-dimensional model, but the difference was not large. In the end, the three-factor model was preferred for theoretical reasons (see Discussion).

Simultaneous evaluation of model fit to sexes. Table 7 shows the results of evaluating equality of factor structure between sexes. The large $\chi 2$/df ratio for the independence model (model 0) suggests that it could be rejected. In comparison, the baseline model (model 1) showed a substantial drop in the $\chi 2$/df ratio, and all fit indices were within criteria. The majority of factor loading (models 2a) and factor regression constraints (models 4a) released to vary between sexes involved Sensory-type components. All covariances between dimensions (model 3) could be made equal between sexes. In further tests of equality of unique variances (models 5-6), the majority of constraints released also comprised Sensory-type aspects. In all cases, releasing constraints did not result in large changes in fit indices despite significant $\chi 2$ change. As indicated in Table 7, the final model attained was associated with a $\chi 2$/df ratio = 2.07 and fit indices ranging from .80-.88. Average standardized residual was .05 for women and .06 for men.

Differences in Components Between Sex and Sexual Context

For each sex, Table 8 lists the mean raw scale scores and scale scores adjusted for covariates for the 12 components of the baseline model. None of the sociodemographic variables or orgasm variables examined predicted particular scale scores to any great effect.[1]

[1]Correlational analyses using Pearson's coefficient and one-way ANOVAs conducted with sociodemographic (age, religion, educational level, sexual orientation, relationship status) and orgasm variables (days since most recent orgasm [solitary masturbation and sex with partner], orgasm duration in seconds [solitary masturbation and sex with partner]) as the independent variables and the scale scores

In each of the two sets of analyses below, scales scores of components not included as IVs were entered as covariates so as to investigate the unique variance associated with the IV components only.

Pleasurable Satisfaction and Emotional Intimacy. A 2 x 2 (Sex [female, male] x Sexual Context [solitary masturbation, sex with partner; repeated measures factor]) mixed MANOVA was performed with Pleasurable Satisfaction (solitary masturbation [Pleasurable Satisfaction1] and sex with partner [Pleasurable Satisfaction2]) and Emotional Intimacy (solitary masturbation [Emotional Intimacy1] and sex with partner [Emotional Intimacy2]) as the DVs. Scale scores for the remaining components, Relaxation, Ecstasy2, Building Sensations, Flooding Sensations, Flushing Sensations, Shooting Sensations, Throbbing Sensations, and General Spasms, were covariates. Pillai's Bartlett criterion was used, and mean scale scores below are adjusted for covariates. To investigate the impact of each effect on the individual DVs, univariate ANOVAs were conducted separately for each DV. Strength of association between the effect and each DV, η^2, was also calculated by dividing Sum of Squares (Effect) by Sum of Squares (Total).

A significant Sex x Sexual Context interaction was observed, $F(2, 885) = 3.80$, $p = .02$. Univariate ANOVA indicated that the mean difference between Pleasurable Satisfaction2 and Pleasurable Satisfaction1 was greater for men ($M = 1.45$) than women ($M = 1.07$), $F(1, 886) = 5.28$, $p = .02$, $\eta^2 = .006$. However, the mean difference between Emotional Intimacy2 and Emotional Intimacy1 was not significantly different between men ($M = 5.57$) and women ($M = 5.69$), $F(1,886) = .17$, $p = .68$. Simple main effects tests revealed a significant sex difference within the solitary masturbation context, $F(2, 877) = 4.01$, $p = .02$. Univariate ANOVA showed a just-significant sex difference in mean scores for Pleasurable Satisfaction1, $F(1, 878) = 3.77$, $p = .05$, $\eta^2 = .004$, and for Emotional Intimacy1, $F(1, 878) = 6.14$, $p = .01$, $\eta^2 = .007$; as seen in Table 8, women had higher

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as dependent variables revealed some reliably significant relationships. However, sigificant absolute correlations between scale scores and age, days since orgasm, and orgasm duration did not exceed .22, and effect sizes for even highly significant F's did not exceed .07. Effect sizes were calculated by dividing the Sum of Squares (Effect) by Sum of Squares (Total).

adjusted mean scores than men on both Pleasurable Satisfaction1 and Emotional Intimacy1. For both DVs, however, the extremely small η^2's suggest that the association between the main effect and each DV was very small. No significant sex difference was observed within the sex with partner context, $F(2, 877) = .44$, $p = .64$.

Simple main effects tests further revealed a significant difference between sexual contexts for both men, $F(2, 885) = 296.50$, $p < .001$, and women, $F(2, 885) = 446.88$, $p < .001$. As noted in Table 8 for men, $t(886) = 10.01$, $p < .001$, and women, $t(886) = 11.35$, $p < .001$, mean scores for Pleasurable Satisfaction2 were higher than for Pleasurable Satisfaction1 (M difference between $\text{contexts}_{\text{male}} = 1.45$; M difference between $\text{contexts}_{\text{female}} = 1.07$). Similarly for men, $t(886) = 29.77$, $p < .001$, and women, $t(886) = 24.34$, $p < .001$, mean scores for Emotional Intimacy2 were higher than for Emotional Intimacy1 (M difference between $\text{contexts}_{\text{male}} = 5.57$; M difference between $\text{contexts}_{\text{female}} = 5.69$).

Remaining factors. With the remaining eight factors in Table 8, a one-way MANCOVA was conducted with the following: Sex as the IV; Relaxation, Ecstasy2, Building Sensations, Flooding Sensations, Flushing Sensations, Shooting Sensations, Throbbing Sensations, and General Spasms as the DVs; and Pleasurable Satisfaction1, Pleasurable Satisfaction2, Emotional Intimacy1, and Emotional Intimacy2 as covariates. A significant main effect of Sex was observed, $F(8, 875) = 89.70$, $p < .001$. Table 8 indicates the components that displayed significant sex differences in univariate ANOVAs. Only Ecstasy2, $F(1, 882) = 3.44$, $p = .06$, and Flooding Sensations, $F(1, 882) = .03$, $p = .87$, were not significant. The remaining DVs were individual significant at ps ranging from .005 to less than .001. However, the strength of association between the Sex effect and each significant DV for the most part remained very small: Relaxation, $\eta^2 = .016$; Building Sensations, $\eta^2 = .009$; Flushing Sensations, $\eta^2 = .038$; Throbbing Sensations, $\eta^2 = .009$; and General Spasms, $\eta^2 = .043$. Only Shooting Sensations showed a notable association, $\eta^2 = .318$.

Discussion

The Three-Dimensional Model

Our results suggest that individual orgasm experiences can be adequately characterized by the three-multidimensional model inluding Sensory (building, flooding, and flushing sensations, shooting and throbbing sensations, general sensation of spasms), Evaluative (pleasure/satisfaction, feeling of relaxation) and Affective (ecstasy, emotional intimacy) dimensions. This model is consistent with previous two-dimensional models proposed by Davidson (1980) and Warner (1981), except that evaluative and affective experiences are explicitly separated. Our rationale for this is that we believe the three-dimensional model to be more conceptually powerful and interesting; the distinction between the Evaluative and Affective dimensions would enable further comparative studies such as investigating orgasmic pleasure and satisfaction as a function of affective variables.

An initial overcorrelation between the Evaluative and Affective dimensions, as well as evaluation of a two-dimensional model, did suggest that these two could be collapsed to form a more parsimonious model like Davidson's and Warner's models. One- and two-dimensional models did fall within criteria for model fit, with the latter showing significant improvement over the former, and thus would also be plausible models. In turn, the three-dimensional model showed little statistical improvement over the two-dimensional model. To deal with the Evaluative-Affective overcorrelation, further theoretically based modifications were imposed to represent hypothesized relationships between sex with partner components reflecting pleasurable satisfaction and emotional intimacy and between those reflecting a sense of relaxation and emotional intimacy. These modifications resolved the overcorrelation problem, leaving a reliable correlation between the Evaluative and Affective dimensions. These modifications also reflect the hypothesis that the within-subjects design for sexual context may account for further variance: Other modifications imposed to evaluate design contribution to variance led to substantial improvement in model fit for both male and female

group data. While this approach may reduce interpretability of the evaluative and affective dimensions as independent constructs to some degree, the three-dimensional model is still an important one to cross-validate.

The relatively large correlations among the Sensory, Evaluative, and Affective dimensions (see Figure 2) overall would support a third-order dimension encompassing all three. Newcomb and Bentler (1983) found a general female orgasmic responsiveness factor that they thought reflected the unitary physiological nature of orgasm. The Sensory-Evaluative correlation was consistently lower than the Sensory-Affective correlation. A stronger relationship might have been expected in the former because, at least with orgasm attained through masturbation, pleasure and satisfaction have been related to stronger physical sensations (e.g., Clifford, 1978; Fisher, 1973; Hite, 1976; Masters & Johnson, 1966). Instead, some evaluative and emotional experiences may be relatively difficult to distinguish, and hence any relationship between the sensory components of masturbatory orgasm and perception of masturbatory orgasm as pleasurable and satisfying may be overshadowed. The slightly larger Sensory-Affective relationship might reflect either 1) a heightened sense of intimacy or ecstasy associated with more diffuse, whole-body sensory experiences associated with sex with a partner, and/or 2) the diffuse, whole-body sensory experiences themselves (cf. Clifford, 1978; Fisher, 1973; Hite, 1976). One related issue is that some adjectives taken to represent sensory experiences may in fact be more semantically ambiguous and hence less reliable measures than others. For example, whereas "throbbing" may clearly convey the sensation of muscular contractions, "building" may be interpreted as concerning either physical tension, emotional intensity, or even both.

Components Within the Three-Dimensional Model

The statistical components obtained corresponded to many constructs within the theoretical model and were reliable across two different methods of factor extraction for both sexes. These components also appear similar to many investigated within the literature on the psychological experience of female orgasm, such as quality of orgasm, happiness,

relaxation, love, and satisfaction (e.g., Fisher, 1973; Hite, 1976). It is notable that all components considered to reflect the Sensory dimension had matching adjectives from both sexual contexts, whereas all but one of the components for the Evaluative and Affective dimensions had adjectives from a single sexual context. Sensory experiences remain consistent across orgasm attained within at least these two sexual contexts. Studies have found no difference when comparing the physiological events of orgasm attained through masturbation versus coitus (e.g., Masters & Johnson, 1966). On the other hand, that pleasure/satisfaction, emotional intimacy, and ecstasy were unique to sexual context is consistent with the proposal that variability in the orgasm response may be at the psychological rather than physical level (Levin, 1981). The degree of pleasure/satisfaction and emotional intimacy experienced with orgasm attained through solitary masturbation appears qualitatively and quantitatively different from that experienced with orgasm through sex with a partner. In comparing individual components, significantly greater pleasure/satisfaction and emotional intimacy were associated with both male and female orgasm attained through sex with a partner, with the sexual context difference appearing more substantive for emotional intimacy. Such differences could reflect the potential for greater sexual and emotional intimacy inherent in the latter condition.

Not all of the components in the theoretical model could be extracted. Some adjectives indicating potentially substantive constructs like subjective duration (e.g., "long", "quick") were eliminated after pilot studies or initial analyses. Others intended to represent distinct constructs instead loaded onto the same component. For example, the first component extracted for both male and female orgasm encompassed adjectives conveying satisfaction, pleasure, and intensity. These constructs do share intrinsic qualities, psychologically and semantically. However, only adjectives conveying pleasure and satisfaction were retained, as these constructs were judged to be relatively more important in describing the orgasm experience. The "Pleasurable Satisfaction" component does indirectly provide information about intensity experiences during masturbatory orgasm. However,

individual measures of intensity would be desirable. Orgasmic satisfaction may be associated with both physical and emotional intensity of the experience. Expectations of a strong relationship between higher satisfaction and stronger physical sensations with masturbatory orgasm (Clifford, 1978; Fisher, 1973; Hite, 1976; Masters & Johnson, 1966) suggest more physically based intensity. The "Ecstasy" component isolated for the sex with a partner condition can arguably reflect emotional intensity of the orgasm attained in that condition. A more explicit measure of intensity distinguishing between the physical and emotional may be useful in providing information about qualitative differences between orgasm attained within interpersonal versus noninterpersonal conditions. Replication with larger samples might allow for a larger number of parameters and hence a more comprehensive model to be evaluated reliably.

Some aspects of the concept of the altered state of consciousness (ASC; Davidson, 1980), such as emotional changes, were apparent in some of the statistical components. Other elements, especially those concerning alterations in sense of space, time, and identity, did not have clear analogues in the current model. Adjectives that might convey such experiences (e.g., "absorbed", "immersing", "suspended", "unifying", "long") either were eliminated after pilot study or initial analyses or loaded onto other components. These particular adjectives and/or reliability of subjects' understanding of their meaning may have not been adequate to represent such experiences. Similarly, components analogous to some of Warner's (1981) physical (e.g., "Throbbing", "Vaginal Sensation") and affective subscales (e.g., "Evaluative") for female orgasm were observed, but others (e.g., "Release", "Continued Arousal", "Sudden Cessation"; "Depressed", "Unresponsive", "Almost") were not. In addition to measuring "peak arousal" rather than "orgasm", Warner grouped descriptive items according to whether they conveyed physical versus affective experiences and then conducted separate exploratory factor analyses on each item set. In the current

study, no a priori categorization of adjectives was implemented during the model-development phase of the main study; all adjectives were included in the same initial principal components analyses.

The Three-Dimensional Model and Male and Female Orgasm

Western thought as well as the relevant literature is replete with stereotypes surrounding the identification of female sexuality with psychological experience versus male sexuality with physical performance. However, our findings suggest that male orgasm encompasses experiences beyond the sensations of ejaculation and that may be similar to female orgasm. During model construction, almost all of the same components extracted for the male group appeared for the female group. Unique components further extracted for the female group ("Relaxation", "Throbbing Sensations", "Building Sensations") generalized to the male group. When components were collapsed across sex to create the full model, model fit was adequate for both the male and female data. The average standardized residuals left after fitting the model were low for both male and female data, indicating that the model accounts for most of the item correlations (Hu & Bentler, 1995). The relations among the sensory, evaluative, and affective dimensions, as well as the general pattern of modifications imposed to improve model fit were also similar between sexes. For example, orgasmic pleasure and satisfaction, sense of emotional closeness, and sense of relaxation may interrelate in both male and female orgasm attained during sex with a partner. In evaluating equality of factor structure, the majority of parameters could be held equivalent between sexes, suggesting that male and female orgasm involve common psychological components. Statistically significant sex differences were noted when examining scale scores for individual components: Women reported higher scores on components representing pleasure/satisfaction and emotional intimacy associated with solitary masturbation orgasm. However, while reliable, these effects were extremely small and so may not reflect substantive sex differences; no significant sex difference was observed within the sex with

partner context. Overall, these findings are consistent with both Vance and Wagner's (1976) findings, in which descriptions of male and female orgasm were indistinguishable, and the similarity of anecdotal descriptions of orgasm between sexes (e.g., Hite, 1976, 1981).

At the same time, investigation of equality of the model's factor structure between sexes suggested that male and female orgasm experiences are not identical. Some parameters, especially sensory types (e.g., adjective loadings of "throbbing2" and "pulsating2" onto "Throbbing Sensations"; "Flushing Sensations" and "Building Sensations" components onto Sensory dimension), had to be allowed to vary between sexes. Scale scores for most of the sensory-type components were also significantly different between sexes, though the effects were overall very small. A relatively substantive effect size was observed for "Shooting Sensations", however, that could be related to sex differences associated with male ejaculation. The general finding of sex differences may be due simply to unique sample characteristics, and cross-validation on an independent sample would be important to examine this. It is possible that sex differences in semantic interpretation of particular adjectives may partly underlie these findings. Evidence exists for sex differences in semantic and affective interpretation of words (e.g., Geer & Melton, 1997; Thompson, Hatchett, & Phillips, 1981), but this has not been consistent (e.g., Khoury, 1977). On the other hand, such findings also support the presence of sex differences, especially those associated with sex differences in the physiological events of orgasm, e.g., male ejaculation.

Methodological Issues

Some methodological limitations within this initial exploratory study should be noted. These include use of retrospective self-report, potentially compounded by social desirability or response faking; the sample being composed primarily of young university students willing to participate in sex research and with sexual experience with both masturbation and sex with a partner; and order effects of presenting the solitary masturbation questionnaire form first.

An important issue concerns fit index values considered to indicate adequate model fit. There is no universally agreed-upon criterion fit index value for model adequacy; the .90 criterion typically recommended (e.g., Bentler, 1995) has been questioned (e.g., Hu & Bentler, 1995; Marsh, Balla, & McDonald, 1988). Significant problems are associated with the use of $\chi 2$ and fit indices, e.g., sample-size effects, the effects of violation of multivariate normality of variables and independence of latent variables, and the effect of model complexity. Many authors have thus advocated that model rejection or acceptance should not be based only on statistical criteria, but also on subjective criteria like interpretation of the data, the model's theoretical and conceptual usefulness, how well the model approximates rather than fits the data, and examination of parameter estimates and average residual values (e.g., Hoyle & Panter, 1995; Hu & Bentler, 1995; Jöreskog, 1971; Marsh et al., 1988). Other researchers have recommended, for example, $\chi 2$/df ratios from 2-5 to indicate adequate model fit (Marsh & Hocevar, 1985). In Marsh and Hocevar's (1985) study of self-concept, models deemed adequate according to $\chi 2$/df ratios and target coefficients were associated with values of the fit index, coefficient Δ, ranging from .64-.85. In light of the these considerations, more liberal values of adequate model fit were selected.

Conclusion

Our goal was to develop a multidimensional model of the orgasm experience, as well as a standardized questionnaire by which to examine the model, that could reveal both phenomenological differences and similarities associated with sex and sexual context in which orgasm occurs. In addition to further comparative studies of male and female orgasm and more empirical attention to male orgasm, issues that can be addressed with the model include the following: the correspondence between objective and subjective measures of orgasm; female and male multiple orgasm, including the role of emission in male multiple orgasm; orgasm typologies and qualitative and quantitative differences between purported orgasms; and qualitative differences between "incomplete" orgasm associated with emission and the altered state of consciousness phenomenon of "true" orgasm in Davidson's (1980)

psychophysiological model of the orgasm response, the bipolar hypothesis. Clinical applications include exploring ejaculatory problems in terms of differences within the model as a function of psychological versus physiological/medical concomitants. Such data could have diagnostic and treatment utility. The role of potentially important psychological, psychosocial, and psychosexual correlates of the orgasm experience similarly would be useful in determining course of sex therapy for individuals presenting with orgasmic difficulties. Certainly a standardized multidimensional questionnaire of orgasmic sensation would serve as a useful clinical assessment tool with clinical populations reporting problems with orgasm.

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Table 1

Initial Theoretical, Semantically Based Three-Dimensional Model of the Psychological Experience of Orgasm.

SENSORY

Buildup of Tension

rising
building
swelling
expanding
tensing
tightening
stopping

Release of Tension

relieving
releasing
erupting
flooding
bursting
exploding

Spreading Sensation from Genitals

flowing
spreading
radiating
sweeping

Rhythmic Sensations

fluttering
quivering
pulsating
throbbing
beating
pounding

Whole-Body Involvement

trembling
shuddering
shivering

Ejaculatory Sensation

oozing
wetting
spurting
shooting

Temperature

cool
warm
hot
bright
burning

Miscellaneous

tickling
tingling
flushing
churning
penetrating
buzzing
straining

EVALUATIVE

Temporal Evaluation

quick
long
prolonged
unending

Intensity

mild
moderate
intense
forceful
powerful
violent
overpowering
earth-shaking

Global Pleasure

pleasant
nice
enjoyable
pleasurable
wonderful
incredible

Sensual Pleasure

soothing
sweet
sensual
exquisite
mystical

Satisfaction

satisfying
gratifying
fulfilling
cathartic
rewarding

Excitement

exhilarating
exciting
wild

Physical Effects

relaxing
tiring
exhausting
draining

Inevitability

relentless
inevitable

"Extent"

deep
engulfing
full
complete

Pain Experiences

dull
aching
cramping
sharp
piercing
electric
painful
agonizing
excruciating
unbearable

AFFECTIVE

Joy-Elation

happy
exuberant
elated
ecstatic
rapturous

Joy-Peacefulness

peaceful
blissful
glowing
euphoric
tender

Physiological Unreality

light-headed
dizzy
reeling

Lack of Awareness of Surround

detached
oblivious
unreal

Involvement in Lack of Awareness of Surround/ Suspension in Space

suspended
unrestrained
floating
drifting
soaring
falling
crashing

Emotional Excitation

intoxicated
abandoned
frenzied
uncontrolled

Oneness/Emotional Fusion

melting
immersing
merging
fusing
unifying

Emotional Closeness

close
loving
passionate
alone

Miscellaneous

vulnerable

Negative Experiences

unnerving
frightening

Table 2

Demographic Characteristics of Analyzed Sample

	Participants	
Demographics	Women (n = 523)	Men (n = 365)
	M (SD)	
Age	23.0 (5.1)	24.9 (7.0)
	Proportion	
Student status		
undergraduate	73.4	65.2
graduate	26.4	33.4
missing	0.2	1.4
Religion		
Catholicism	36.1	32.3
Protestantism	22.4	18.1
Judaism	11.7	16.4
Islam	2.3	3.6
other	9.9	10.4
no religion	17.4	18.6
missing	0.2	0.5
Primary sexual orientation		
heterosexual	86.4	81.6
homosexual	6.5	14.2
bisexual	6.5	3.8
missing	0.6	0.3
Relationship status		
single	34.0	37.8
with partner, not living together	44.9	37.3
living together/ married	19.1	22.2
other	1.9	2.5
missing	0.0	0.3

Table 3

Statistically Derived Components from Initial Principal Components Analyses

Component	Sex			
	Women		Men	
	Adjective	Loading	Adjective	Loading
1	incredible	.75	**satisfying**	.79
	powerful	.73	**pleasurable**	.74
	fulfilling	.69	exciting	.71
	satisfying	.65	**fulfilling**	.71
	intense	.65	intense	.68
	exciting	.63	incredible	.65
	wild	.62	euphoric	.63
	euphoric	.60	ecstatic	.57
	pleasurable	.57	powerful	.54
	ecstatic	.57	elated	.51
	blissful	.53	blissful	.48
	rapturous	.51	exploding	.48
	elated	.49		
	uncontrolled	.48		
	engulfing	.45		
2	**pleasurable2**	.79	**loving2**	.82
	satisfying2	.75	**unifying2**	.79
	fulfilling2	.68	**close2**	.73
	incredible2	.64	passionate2	.73
	intense2	.59	tender2	.60
	powerful2	.52	warm2	.57
	complete2	.47	sensual2	.55
			complete2	.43
			absorbed2	.42
3	**euphoric2**	.67	**shuddering2**	.74
	elated2	.66	**quivering2**	.73
	rapturous2	.66	**trembling2**	.64
	ecstatic2	.62	**shuddering**	.60
	blissful2	.57	**quivering**	.57
	engulfing2	.43	**trembling**	.49
			throbbing2	.45
			engulfing2	<.40
4	**loving2**	.75	**shooting2**	.81
	tender2	.68	**spurting2**	.68
	close2	.64	erupting2	.65
	unifying2	.63	exploding2	.60
	passionate2	.58	**shooting**	.59
	sensual2	.55	hot2	.51
	(soothing2)[1]	(.44)	**spurting**	.46
			erupting	<.40
			rising	<.40

5	**shuddering2**	.73	**satisfying2**	.84
	shuddering	.71	**pleasurable2**	.78
	trembling2	.67	**fulfilling2**	.72
	quivering2	.64	exciting2	.53
	quivering	.62	incredible2	.50
	trembling	.61	wild2	<.40
6	**close**	.72	**tender**	.71
	passionate	.72	**close**	.68
	unifying	.66	**loving**	.65
	loving	.60	passionate	.52
	sensual	.46	sensual	.50
			unifying	.50
7	**flowing**	.72	**flushing2**	.68
	flooding	.63	**spreading2**	.65
	flowing2	.61	**flushing**	.65
	flooding2	.58	**spreading**	.53
8	**relaxing**	.70	**ecstatic2**	.71
	soothing	.70	**elated2**	.61
	peaceful	.65	**rapturous2**	.45
	relaxing2	.53	euphoric2	.44
	soothing2	.53	blissful2	.41
	peaceful2	.51		
9	**spurting2**	.76		
	spurting	.72		
	shooting2	.58		
	shooting	.54		
10	**throbbing2**	.73		
	throbbing	.72		
	pulsating	.71		
	pulsating2	.61		
11	**building2**	.76		
	building	.72		
	swelling	.56		
	swelling2	.44		

Note: All adjectives ending in "2" are those rated to describe orgasm attained within the sexual context of sex with a partner. Adjectives in bold were retained for further analyses. [1]Adjectives and loadings in brackets indicate secondary loadings.

Table 4

Comparison of Results of Second Principal Components Analyses and Maximum Likelihood Factor Analyses for Each Sex

Component	Sex							
	Women				Men			
	Principal Components Analysis		Maximum Likelihood Analysis		Principal Components Analysis		Maximum Likelihood Analysis	
	Adjective	Loadings	Adjective	Loadings	Adjective	Loadings	Adjective	Loadings
1	shuddering	.75	trembling2	.70	shuddering2	.79	shuddering2	.74
	shuddering2	.75	shuddering2	.70	quivering2	.71	quivering2	.68
	trembling2	.73	trembling	.67	shuddering	.69	trembling2	.61
	trembling	.73	shuddering	.66	quivering	.67	quivering	.60
	quivering	.64	quivering2	.59	trembling2	.66	shuddering	.59
	quivering2	.62	quivering	.58	trembling	.61	trembling	.56
2	relaxing	.74	relaxing	.64	flushing2	.77	satisfying2	.86
	relaxing2	.68	soothing2	.62	flushing	.76	pleasurable2	.71
	soothing	.65	relaxing2	.60	spreading2	.68	fulfilling2	.68
	peaceful	.65	peaceful2	.59	spreading	.67		
	soothing2	.65	soothing	.58				
	peaceful2	.63	peaceful	.57				
3	flowing	.74	spurting2	.67	spurting	.74	shooting	.65
	flooding	.74	shooting2	.64	shooting	.74	spurting2	.64
	flooding2	.66	spurting	.61	spurting2	.72	spurting	.64
	flowing2	.63	shooting	.59	shooting2	.72	shooting2	.63
4	spurting	.74	satisfying2	.74	satisfying2	.86	satisfying	.82
	spurting2	.72	pleasurable2	.71	pleasurable2	.77	fulfilling	.74
	shooting	.69	fulfilling2	.61	fulfilling2	.76	pleasurable	.62
	shooting2	.68						

5	pulsating	.75	throbbing	.69	satisfying	.84	loving2	.76
	throbbing	.73	throbbing2	.66	fulfilling	.77	unifying2	.73
	throbbing2	.72	pulsating	.63	pleasurable	.75	close2	.68
	pulsating2	.66	pulsating2	.54				
6	rapturous2	.72	flooding	.66	loving	.78	flushing	.72
	elated2	.70	flowing	.62	tender	.78	flushing2	.71
	euphoric2	.68	flooding2	.56	close	.68	spreading2	.53
	(quivering2)[1]	(.42)	flowing2	.51			spreading	.49
7	satisfying2	.80	swelling	.69	close2	.80	loving	.75
	pleasurable2	.80	building	.58	loving2	.77	tender	.64
	fulfilling2	.70	building2	.58	unifying2	.76	close	.51
			swelling2	.57			(spreading)	(.41)
8	building	.75	satisfying	.71	ecstatic2	.80	elated2	.66
	building2	.75	fulfilling	.68	elated2	.72	ecstatic2	.58
	swelling	.69	pleasurable	.62	rapturous2	.64	rapturous2	.50
	swelling2	.55						
9	satisfying	.78	rapturous2	.62				
	fulfilling	.76	elated2	.57				
	pleasurable	.73	euphoric2	.54				
10	tender2	.74	close	.66				
	loving2	.71	passionate	.64				
	close2	.67	unifying	.64				
11	close	.79	loving2	.61				
	passionate	.76	tender2	.60				
	unifying	.72	close2	.51				

Note: All adjectives ending in "2" are those rated to describe orgasm attained within the sexual context of sex with a partner. [1]Adjectives and loadings in brackets indicate secondary loadings.

Table 5

Factor-Score Covariance Matrices from Maximum Likelihood Analyses for Each Sex

Factor	1	2	3	4	5	6	7	8	9	10	11
					Women (n = 523)						
1	**.81**	--	--	--	--	--	--	--	--	--	--
2	-.006	**.77**	--	--	--	--	--	--	--	--	--
3	.029	.017	**.74**	--	--	--	--	--	--	--	--
4	-.008	.049	-.005	**.75**	--	--	--	--	--	--	--
5	.066	-.010	.046	.016	**.75**	--	--	--	--	--	--
6	.005	.036	.064	-.017	.005	**.70**	--	--	--	--	--
7	.053	-.024	.017	.014	.034	.083	**.72**	--	--	--	--
8	.013	.026	-.035	.032	.034	.014	.043	**.76**	--	--	--
9	.060	.016	.034	.097	-.004	.050	.011	-.020	**.68**	--	--
10	.011	.047	.054	-.057	-.005	.038	-.019	.065	.001	**.70**	--
11	.001	.085	.010	.058	-.007	-.006	.020	-.010	.027	.027	**.68**
					Men (n = 365)						
1	**.80**	--	--	--	--	--	--	--			
2	.005	**.83**	--	--	--	--	--	--			
3	.071	.002	**.74**	--	--	--	--	--			
4	.014	.033	.028	**.81**	--	--	--	--			
5	.000	.067	-.001	-.038	**.78**	--	--	--			
6	.055	-.008	.033	-.018	.039	**.75**	--	--			
7	.031	-.035	.004	.078	.038	.071	**.73**	--			
8	.057	.059	.062	-.002	.064	.017	.021	**.63**			

Table 6

Steps in Fitting Baseline Model to Each Sexual Context

Models	$\chi 2$	df	$\Delta \chi 2$	$\chi 2$/df	NNFI	CFI	IFI	GFI
			Women (n = 523)					
0. Independence model	13487.35	1275	--	10.58	--	--	--	--
Measurement Models								
1. 12 components (basic model)	2855.13	1158	--	2.47	.80	.84	.82	.78
2. εflushing1-εflushing2 (.44)	2789.96	1157	65.17**	2.41	.81	.85	.83	.78
3. εspreading1-εspreading2 (.43)	2759.02	1156	30.94**	2.39	.82	.85	.83	.78
4. εtender1-εtender2 (.37)	2720.43	1155	38.59**	2.36	.81	.85	.83	.78
5. εbuilding1-εbuilding2 (.40)	2660.36	1154	60.07**	2.31	.82	.86	.84	.78
6. εpeaceful1-εsoothing1	2627.83	1153	32.53**	2.28	.82	.86	.84	.79
7. εbuilding1-εswelling1 (.33)	2585.13	1152	42.70**	2.24	.83	.87	.85	.79
Structural Models								
8. 12 components / three dimensions	2892.26®	1203	--	2.40	.81	.84	.82	.76
9. ψThrobbing Sensations-ψGeneral Spasms (.36)	2862.47®	1202	29.79**	2.38	.81	.84	.82	.77
10. ψPleasurable Satisfaction2-ψEmotional Intimacy2 (.40)	2855.76®	1201	6.71*	2.38	.81	.85	.82	.77
11. ψRelaxation-ψEmotional Intimacy2 (.64)	2823.59	1200	32.17**	2.35	.82	.85	.83	.77
Additional Modifications								
12. Split: A. General Spasms into General Spasms1 and General Spasms B. Relaxation into Relaxation1 and Relaxation	2766.31	1198	--	2.31	.82	.85	.83	.78
13. Add Sexual Context related covariances A. Correlated disturbances: ψPleasurable Satisfaction1-ψEmotional Intimacy1 (.35) ψPleasurable Satisfaction1-ψRelaxation1 (.47) ψRelaxation1-ψEmotional Intimacy1 (.45) ψPleasurable Satisfaction2-ψEcstasy2 (.52)	2662.77	1194	--	2.23	.83	.86	.84	.79

B. Correlated errors (same adjectives between sexual context): εswelling1-εswelling2 (.39) εflowing1-εflowing2 (.34) εspurting1-εspurting2 (.48) εshuddering1-εshuddering2 (.38) εquivering1-εquivering2 (.25) εtrembling1-εtrembling2 (.42) εpeaceful1-εpeaceful2 (.31) εrelaxing1-εrelaxing2 (.29)	2398.60	1187	--	2.02	.86	.89	.87	.80
C. Correlated errors (similar adjectives within sexual context): εflooding1-εflowing1 (.31) εspreading1-εflushing1 (.25) εthrobbing1-εpulsating1 (.33) εshooting1-εspurting1 (.34) εunifying2-εtender2 (-.22) εclose2-εtender2 (-.16) (εpeaceful1-εsoothing1 nonsignificant, fixed to 0)	2226.13	1181	--	1.88	.87	.90	.88	.82
ALTERNATIVE MODELS								
<u>Measurement Models</u>								
A. One component	6990.74	1224	--	5.71	.41	.46	.44	.51
B. Two components	6058.24	1223	932.50**	4.95	.50	.55	.52	.58
C. Three components	5827.67	1221	230.57**	4.77	.52	.57	.55	.58
<u>Structural Models</u>								
D. 12 components / one dimension	3076.79	1206	--	2.55	.79	.82	.80	.75
E. 12 components / two dimensions	2925.86	1205	150.93**	2.43	.81	.84	.82	.76
			Men (n = 365)					
0. Independence model	10192.42	1275	--	7.99	--	--	--	--
<u>Measurement Models</u>								
1. 12 components (basic model)	2452.19	1158	--	2.12	.79	.83	.81	.74
2. εbuilding1-εbuilding2 (.44)	2416.44	1157	35.75**	2.09	.80	.84	.82	.74
3. εflooding1-εflooding2 (.36)	2399.88	1156	16.56**	2.08	.80	.84	.82	.74
4. εrelaxing1-εrelaxing2 (.40)	2377.46	1155	22.42**	2.06	.80	.84	.82	.74
5. εbuilding1-εswelling1 (.41)	2323.11	1154	54.35**	2.01	.81	.85	.83	.75
6. εpulsating1-εthrobbing1 (.35)	2302.72	1153	20.39**	2.00	.81	.85	.83	.76
7. soothing1 ∋ Pleasurable Satisfaction1	2280.56	1152	22.16**	1.98	.82	.85	.84	.76

Structural Models								
8. 12 components / three dimensions	2524.27®	1203	--	2.10	.80	.83	.81	.73
9. ψPleasurable Satisfaction1-ψEmotional Intimacy1 (.53)	2498.11®	1202	26.16**	2.08	.80	.83	.81	.74
10. ψPleasurable Satisfaction2-ψEmotional Intimacy2 (.42)	2497.19®	1201	.92†	2.08	.80	.83	.82	.74
11. ψRelaxation-ψEmotional Intimacy2 (.54)	2479.18	1200	18.01**	2.08	.80	.84	.82	.74
Additional Modifications								
12. Split: A. General Spasms into General Spasms1 and General Spasms2 B. Relaxation into Relaxation1 and Relaxation2	2405.57	1198	--	2.01	.82	.84	.83	.75
13. Add Sexual Context related covariances A. Correlated disturbances: ψPleasurable Satisfaction1-ψRelaxation1 (.65) ψRelaxation1-ψEmotional Intimacy1 (.35) ψPleasurable Satisfaction2-ψEcstasy2 (.49)	2350.30	1195	--	1.97	.82	.85	.83	.76
B. Correlated errors (same adjectives between sexual context): εswelling1-εswelling2 (.27) εpulsating1-εpulsating2 .28) εshuddering1-εshuddering2 (.39) εtrembling1-εtrembling2 (.31) εflushing1-εflushing2 (.36) εshooting1-εshooting2 (.39) εtender1-εtender2 (.15) εclose1-εclose2 (-.12) εfulfilling1-εfulfilling2 (.31) εpleasurable1-εpleasurable2 (.23) εpeaceful1-εpeaceful2 (.35)	2178.36	1183	--	1.84	.84	.87	.86	.77

C. Correlated errors (similar adjectives within sexual context):	2060.28	1174	--	1.75	.86	.89	.87	.79
εflooding1-εflowing1 (.19)								
εspreading1-εflushing1 (.20)								
εthrobbing1-εpulsating1 (.35)								
εshooting1-εspurting1 (.35)								
εecstatic2-εelated2 (.18)								
εecstatic2-εeuphoric2 (.24)								
εclose1-εtender1 (.22)								
εloving1-εtender1 (.24)								
εunifying2-εtender2 (-.26)								
εfulfilling2-εpleasurable2 (-.71)								
εsatisfying1-εfulfilling1 (.40)								
εsatisfying1-εpleasurable1 (.26)								
(soothing1 ə Pleasurable Satisfaction1 nonsignificant, fixed to 0)								
ALTERNATIVE MODELS								
Measurement Models								
A. One component	5084.43	1224	--	4.15	.46	.50	.49	.54
B. Two components	4665.58	1223	418.85**	3.81	.52	.56	.54	.56
C. Three components	4534.80	1221	130.78**	3.71	.53	.57	.56	.56
Structural Models								
D. 12 components / one dimension	2595.20	1206	--	2.15	.79	.82	.80	.73
E. 12 components / two dimensions	2542.29	1205	52.91**	2.11	.80	.83	.81	.73

Note: Each modified model includes the preceding modifications; ε = error variance associated with adjectives, ψ = disturbance associated with dependent components; ə = regression coefficient between an adjective and component. Words in lowercase denote adjectives; words with first letters in uppercase denote components; and words in all uppercase denote dimensions. The number in brackets after each modification represents that modification's standardized parameter coefficient. All $\chi 2$ and CFI values are corrected for nonnormal data. A "1" after an adjective or component indicates a solitary masturbation variable; a "2" indicates a sex with partner variable.
**p < .001 *p< .01 †p > .05 ®correlation between Evaluative and Affective dimensions > 1.00.

Figure Caption

Figure 1. Standardized Parameter Estimates for the Three-Dimensional Model of the Psychological Experience of Orgasm for Both Sexes.

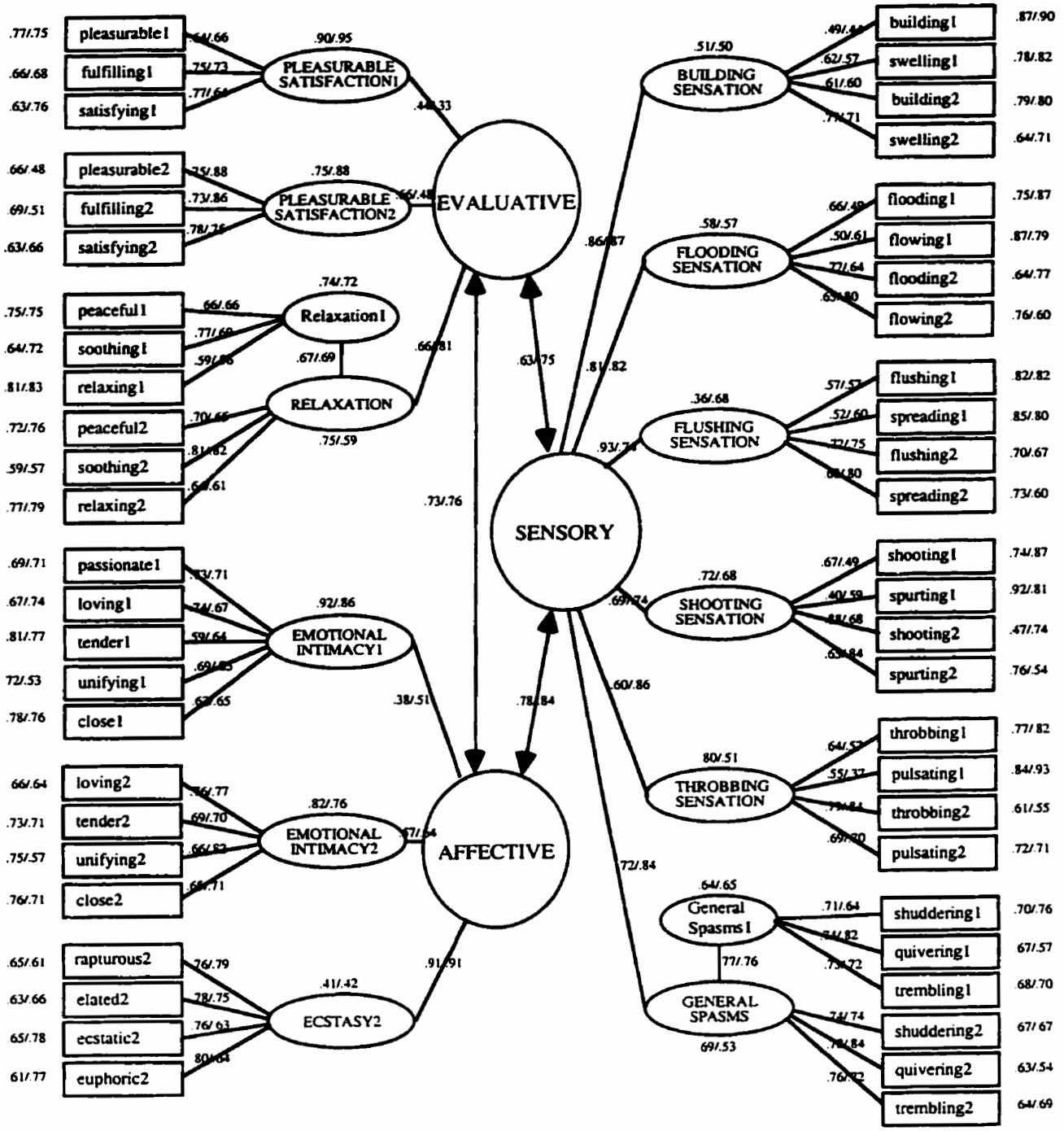
EVALUATIVE
AFFECTIVE
SENSORY
PLEASURABLE SATISFACTION1
PLEASURABLE SATISFACTION2
Relaxation1
RELAXATION
EMOTIONAL INTIMACY1
EMOTIONAL INTIMACY2
ECSTASY2
BUILDING SENSATION
FLOODING SENSATION
FLUSHING SENSATION
SHOOTING SENSATION
THROBBING SENSATION
General Spasms1
GENERAL SPASMS
pleasurable1
fulfilling1
satisfying1
pleasurable2
fulfilling2
satisfying2
peaceful1
soothing1
relaxing1
peaceful2
soothing2
relaxing2
passionate1
loving1
tender1
unifying1
close1
loving2
tender2
unifying2
close2
rapturous2
elated2
ecstatic2
euphoric2
building1
swelling1
building2
swelling2
flooding1
flowing1
flooding2
flowing2
flushing1
spreading1
flushing2
spreading2
shooting1
spurting1
shooting2
spurting2
throbbing1
pulsating1
throbbing2
pulsating2
shuddering1
quivering1
trembling1
shuddering2
quivering2
trembling2

Table 7

Steps in Testing Equality of Model Factor Structure Between Sexes

Competing models	χ^2	df	$\Delta\chi^2$	χ^2/df	NNFI	CFI	IFI	GFI
			N = 888					
0. Independence model	23679.77	2550	--	9.29	--	--	--	--
1. Baseline 12-factor / 3 second-order factor model	4951.79	2355	--	2.52	..87	.88	.88	.81
2. All free factor loadings constrained to be equal between sexes	5069.68	2392	--	2.12	.87	.87	.87	.80
2a. Constraints released:								
shooting2 ə Shooting Sensations	5054.57	2391	15.11***	2.11	.87	.87	.88	.81
shooting1 ə Shooting Sensations	5028.13	2390	26.44***	2.10	.87	.88	.88	.81
flooding1 ə Flooding Sensations	5018.51	2389	9.62**	2.10	.87	.88	.88	.81
flooding2 ə Flooding Sensations	5009.09	2388	9.42**	2.10	.87	.88	.88	.81
rapturous2 ə Ecstasy2	5003.86	2387	5.23*	2.10	.87	.88	.88	.81
quivering2 ə General Spasms	4999.17	2386	4.69*	2.10	.87	.88	.88	.81
unifying2 ə Emotional Intimacy2	4994.47	2385	4.70*	2.09	.87	.88	.88	.81
3. All latent factor variances/ covariances constrained to be equal between sexes	4997.53	2388	--	2.09	.87	.88	.88	.81
4. All latent factor regression coefficients constrained to be equal between sexes	5048.00	2402	--	2.10	.87	.88	.88	.81
4a. Constraints released:								
Throbbing Sensations ə SENSORY	5035.40	2401	12.60***	2.10	.87	.88	.88	.81
Shooting Sensations ə SENSORY	5023.27	2400	12.13***	2.09	.87	.88	.88	.81
Flushing Sensations ə SENSORY	5016.20	2399	7.07**	2.09	.87	.88	.88	.81
Ecstasy2 ə AFFECTIVE	5010.91	2398	5.29*	2.09	.87	.88	.88	.81
5. All disturbance variances/ covariances constrained to be equal between sexes	5101.98	2418	--	2.11	.87	.87	.87	.80
5a. Constraints released:								
ψThrobbing Sensations	5080.69	2417	21.29***	2.10	.87	.87	.88	.80
ψFlushing Sensations	5066.19	2416	14.50***	2.10	.87	.88	.88	.80
ψGeneral Spasms	5055.76	2415	10.43**	2.09	.87	.88	.88	.80
ψPleasurable Satisfaction2	5048.95	2414	6.81**	2.09	.87	.88	.88	.81
loving1 ə Emotional Intimacy1	5042.98	2413	5.97*	2.09	.87	.88	.88	.81
ψPleasurable Satisfaction1-ψEmotional Intimacy1	5037.38	2412	5.60*	2.09	.87	.88	.88	.81
ψShooting Sensations	5031.87	2411	5.51*	2.09	.87	.88	.88	.81
ψBuilding Sensations-SENSORY	5027.36	2410	4.51*	2.09	.87	.88	.88	.81
ψPleasurable Satisfaction1-ψRelaxation1	5023.04	2409	4.32*	2.09	.87	.88	.88	.81
pleasurable1 ə Pleasurable Satisfaction1	5019.12	2408	3.92*	2.08	.87	.88	.88	.81

6. All common error variances/ covariances constrained to be equal between sexes	5250.43	2473	--	2.12	.86	.87	.87	.80
6a. Constraints released:								
εunifying2	5072.33	2454	178.10	2.07	.87	.88	.88	.80
εshooting2								
εshooting1								
εsatisfying1								
εspurting2								
εtender1								
εtender1-εtender2								
εspread1								
εflowing2								
εspread2								
εsatisfying2								
εflooding2								
εrelaxing2								
εquivering1								
εeuphoric2								
εspreading2 ə Flushing Sensations								
εpleasurable1								
εflowing1								
εflooding1-εflowing1								

Note: Each modified model includes the preceding modifications; ε = error variance associated with adjectives, ψ = disturbance associated with dependent components; ə = regression coefficient between an adjective and component or between a component and dimension. Words in lowercase denote adjectives; words with first letters in uppercase denote components; and words in all uppercase denote dimensions. All $\chi 2$ and CFI values are not corrected for nonnormal data. A "1" after an adjective or component indicates a solitary masturbation variable; a "2" indicates a sex with partner variable.
***p < .001 **p < .01 *p < .05.

Table 8

Raw Scale Scores and Scale Scores Adjusted for Covariates for Each Sex

Factor	Sex	
	Women	Men
	M(SD) / Madjusted	M(SD) / Madjusted
Pleasurable Satisfaction1	11.35(2.85) / 11.16*	10.47(3.23) / 10.66
Pleasurable Satisfaction2	12.86(2.52) / 12.75†††	12.53(2.65) / 12.63
Emotional Intimacy1	5.11(5.13) / 5.27*	4.43(4.86) / 4.26
Emotional Intimacy2	13.15(5.02) / 12.89†††	12.30(5.42) / 12.56
Relaxation	16.55(6.99) / 16.05***	17.03(6.56) / 17.53
Ecstasy2	10.93(5.51) / 10.58	10.79(5.07) / 11.14
Building Sensations	11.30(5.45) / 11.00***	9.74(5.13) / 10.04
Flooding Sensations	9.18(5.15) / 8.90	8.57(4.93) / 8.84
Flushing Sensations	9.66(5.40) / 9.40***	7.21(4.96) / 7.47
Shooting Sensations	5.46(4.98) / 5.25***	11.68(5.17) / 11.89
Throbbing Sensations	13.09(4.83) / 12.82***	11.69(4.58) / 11.96
General Spasm	17.39(7.52) / 16.98***	14.67(7.17) / 15.08

Note: Significance levels indicated by "*" involve between-sex (horizontal) comparisons, ***$p \leq .001$ *$p = .01$-$.05$. Significance levels indicated by "†" involve between-sexual context (vertical) comparisons, †††$p \leq .001$.

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Transitional Text 2

From the results of the first study, the descriptive model first proposed in the review paper (Mah & Binik, 2000) appears to be a useful one, both in terms of quantitative and qualitative description of the orgasm response and as a framework by which sex differences (or similarities) can be readily evaluated. The findings also indicate the potential of the adjective-ratings questionnaire as an effective means of measuring the psychological orgasm experience in both men and women for both empirical and clinical purposes.

While offering initial evidence for the adequate psychometric properties of the questionnaire, though, the first study was more focused on modelling of the subjective orgasm experience rather than on measurement issues. The following study thus sought to identify some of the psychometric characteristics of the adjective-ratings questionnaire more thoroughly and to provide support for the adjective-ratings approach in general as a reasonable means of studying the psychological orgasm experience. This was accomplished primarily by investigating the interrelationships among different elements of the three-dimensional model and other important characteristics and psychosocial correlates of the orgasm experience. Within this context, the three-dimensional model as a model of both male and female orgasm was itself subjected to further cross-validation in an independent sample.

References

Mah, K. & Binik, Y. M. (2000). The nature of human orgasm: A critical review of major trends. Manuscript submitted for publication.

Running Head: QUESTIONNAIRE OF THE ORGASM EXPERIENCE

The McGill-Mah Orgasm Questionnaire:
A Qualitative and Quantitative Measure of the Orgasm Experience

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Abstract

The current study presents the McGill-Mah Orgasm Questionnaire, a standardized adjective-rating measure of the psychological experience of orgasm applicable to both sexes, and evaluates its psychometric properties. A three-dimensional model of the subjective orgasm experience on which the measure is based (Mah & Binik, 2000b) is also tested, and validity issues are examined by investigating relations among orgasm characteristics such as intensity, location of sensation, and relationship factors and components of the model. A university student sample of 503 women and 295 men completed the Orgasm Questionnaire to convey their experience of orgasm attained either through solitary masturbation or sex with a partner. Good internal consistency of the adjectives in the Questionnaire was observed. The model adequately described both male and female orgasm experiences, corroborating Mah and Bink's (2000b) findings and suggesting that male and female orgasm are similar, though not identical. Orgasm attained through sex with a partner was both emotionally and physically more intense and was associated with greater emotional intimacy than masturbatory orgasm. Ratings on items concerning relationship happiness and satisfaction were related to affective-type components for orgasm attained through sex with a partner. The component conveying feelings of emotional intimacy during orgasm was related to ratings of emotional intensity, but the component reflecting feelings of ecstasy was more related to ratings of physical intensity and the physical components of orgasm. Relationships between anatomical location of orgasm and scores on the sensory components were generally in expected directions, and overall findings did not support a reductionist emphasis on ejaculation for male orgasm. The McGill-Mah Orgasm Questionnaire is a promising measure, and future validity studies further elaborating on the questionnaire and the three-dimensional model are warranted.

THE MCGILL-MAH ORGASM QUESTIONNAIRE:
A QUALITATIVE AND QUANTITATIVE MEASURE OF THE ORGASM EXPERIENCE

Given the centrality of orgasm to the human sexual experience, it is surprising that our understanding of the psychology of orgasm is so deficient. In a review of the relevant literature, Mah and Binik (2000a) identified the lack of a widely used, standardized psychometric instrument as a major difficulty. Our goal is to present such a measure based on an adjective-ratings approach.

Previous measures of the subjective orgasm experience have employed a variety of formats. Some investigators have applied open-ended reports in which participants provide written descriptions of orgasm experiences (e.g., Butler, 1976; Fisher, 1973; Hite, 1976, 1981; Sholty et al., 1984; Vance & Wagner, 1975). However, nonstandardized data make within- and cross-study comparisons difficult. Others have used more standardized measures which required participants to rank (Fisher, 1973) or rate given items (Bentler & Peeler, Jr., 1979; Clifford, 1978; Newcomb & Bentler, 1983; Warner, 1981).

Several problems have hampered the generalizability of findings from these measures. An absence of systematic psychometric information has limited the usefulness and interpretation of findings. For example, Fisher's (1973) two sets of 10 adjectives measuring orgasm and post-orgasm experiences restrict the range of measurement and do not allow a comprehensive picture of the orgasm experience to emerge. Fisher's ranking system, in which individuals ranked each of the adjectives from most to least descriptive of their orgasm experiences, also does not ensure that the adjectives are actually suitable descriptors, only that some adjectives were deemed better relative to others in the set. Clifford's (1978) measure of female orgasm is an improvement in both number of items and scale used, but neither the checklist nor psychometric data were available in published report.

Some of the measures were developed to evaluate theories concerning orgasm experiences. The measure by Bentler and Peeler, Jr. (1979) and Newcomb and Bentler

(1983) was used to investigate dimensions of female orgasmic responsiveness as a function of sexual contexts. Warner's (1981) measure was developed for a more basic purpose, to identify and describe core physical and affective constructs of the female orgasm experience. This measure, the Peak of Sexual Response Questionnaire (Warner, 1988, 1998), is also one of the rare measures that have been published but does not appear to have been used. Some of the constructs Warner identified (e.g., "Depressed", "Unresponsive", "Almost") may not be representative of the orgasm experience but may be an artifact of asking women to convey their "physical peak" experiences rather than orgasm experiences. This approach may confound nonorgasmic arousal states with orgasm and may further exclude orgasm experiences in which affective elements predominate (cf. Clifford, 1978; Fisher, 1973; Hite, 1976; cf. Butler, 1976).

An Adjective-Ratings Approach to Measuring Orgasm Experiences

Although studies exist which have focused on different dimensions of the orgasm experience primarily in women (see Mah & Binik, 2000a), there is a lack of research like Warner's (1981) study investigating the core constructs of the orgasm experience. A theory-driven measure to distinguish these core constructs is also clearly needed in this respect. Mah and Binik (2000a) proposed the use of adjectives obtained from a wide range of open-ended self-reports (e.g., Hite, 1976, 1981; Vance & Wagner, 1976) as appropriate items for measuring the subjective experience of orgasm. There are several advantages to using adjectives as opposed to phrases or sentences. The use of adjectives a) permits subjective experience and anatomical location of sensation to be evaluated separately; b) enables comparisons between male and female experiences; c) allows more stimuli to be included, enhancing reliability and permitting sophisticated analyses such as factor analytic strategies; d) may increase response rates by reducing the amount of time to complete the measure as well as the embarrassment and discomfort associated with such personal self-reports--single words may be perceived as less embarrassing than sentences.

Mah and Binik (2000a) noted a preponderance of psychological studies dealing with female orgasm, but a reductionist view of male orgasm in the large number of studies investigating ejaculatory processes. The lack of self-report measures of male orgasm experiences and measures that allow detailed comparison of male and female orgasm experiences was also evident. In an initial study of male and female orgasm experience, Mah and Binik (2000b) devised an adjective-ratings scale, the McGill-Mah Orgasm Questionnaire, from adjectives gathered from a wide range of open-ended self-report studies. A total of 888 university students (523 women) rated an initial set of 60 adjectives according to how well each adjective described their most recent orgasm experience attained either through solitary masturbation or sex with a partner. A three-dimensional model of the psychological experience of orgasm involving sensory, evaluative, and affective dimensions and their respective components was then developed using principal components analyses and a theoretical a priori model; a subset of 28 of the original 60 adjectives was retained to form the components (see Figure 1). The derived model was then tested using confirmatory factor analysis (CFA) to determine whether female and male orgasm could be described by the model. Differences in components across sex and sexual context were also examined.

The questionnaire demonstrated good internal consistency of both the adjectives and the components themselves. Results also provided emerging evidence for construct validity. Figure 1 summarizes the basic components of the model and their defining adjectives, as well as the dimension that each component was thought to represent. Components extracted were similar to those proposed in an a priori theoretical model. While not shown in Figure 1, the same adjectives from the two sexual contexts (solitary masturbation, sex with partner) grouped into two homologous components for each of the evaluative and affective constructs. These components conveyed the same construct but were distinguished by the sexual context with which their respective adjectives were associated. In contrast, each of the sensory constructs included the same adjectives from both sexual contexts.

CFA suggested that the three-dimensional model adequately described both male and female orgasm but also underlined some sex differences, especially within sensory-type experiences. While mean scores on most of the sensory-type components were similar between sexes and contexts, scores for pleasure/satisfaction and especially emotional intimacy were higher for the sex with partner than the solitary masturbation context. A component conveying feelings of ecstasy was unique to the sex with partner context, and scores for one sensory component potentially reflecting ejaculatory sensations showed an expected sex difference.

The major purposes of this study were to a) present the McGill-Mah Orgasm Questionnaire, b) present new reliability and validity data on the scale, and c) confirm the reliability and validity of the three-dimensional model. The validity of the measure and model was investigated by looking at the relations between the components of the model and orgasm intensity, location of orgasm sensation, and relationship satisfaction/emotional closeness to partner.

Intensity and location of orgasm experiences. Intensity and location of orgasm sensation have been at the heart of controversy concerning typologies of female orgasm, including the clitoral versus vaginal orgasm distinction. Some studies have reported that orgasm attained through clitoral stimulation is more localized, intense, and physically satisfying than orgasm attained through intercourse, which is reportedly more diffuse, "whole-body", or deeper, stronger and longer lasting, and more psychologically satisfying (e.g., Butler, 1976; Clifford, 1978; Fisher, 1973; Hite, 1976). Some investigators, though, have concluded that strength and degree of female orgasm gratification are not related to area of stimulation or perceived location of orgasm (e.g., Butler, 1976; Fisher, 1973).

In the three-dimensional model developed by Mah and Binik (2000b), some of the components (e.g., "Ecstasy") seemed to reflect more of an emotional type of intensity, while others (e.g., "General Spasms"), more of a physical type. However, while intensity could be conveyed indirectly through such components, no component clearly represented intensity of

orgasm. Location of orgasm sensation was also not addressed directly in the adjective-rating scale. New items were thus created to evaluate these two characteristics. The following hypotheses were tested: 1) Groups reporting about orgasm attained through sex with a partner will show higher ratings of emotional intensity of orgasm and lower ratings of physical intensity than groups reporting about orgasm attained through solitary masturbation; 2) ratings of emotional intensity of orgasm will be associated more with affective components, whereas ratings of physical intensity will be associated more with sensory components; 3) more participants reporting about orgasm attained through sex with a partner will endorse items reflecting diffusion of sensation throughout the pelvic region or the body; 4) more participants reporting about orgasm attained through solitary masturbation will endorse items reflecting localization of sensation within the genitals; and 5) genital localization of sensation will be positively associated with sensory-type components that seem to convey relative localization of sensation, whereas diffusion of sensation will be positively associated with sensory-type components that seem to reflect relative diffusion of sensation.

Relationship satisfaction and emotional closeness. One of the most robust correlates of orgasm frequency, quality, and satisfaction in women have been relationship factors such as marital satisfaction, happiness, and stability (see Mah & Binik, 2000a). Uncontrolled self-report studies of male multiple orgasm also suggest that emotional closeness with the partner is a necessary condition (e.g., Dunn & Trost, 1989). Items measuring relationship satisfaction, relationship happiness, and emotional closeness with the partner were thus included to investigate the hypothesis that relationship factors will be predictive of ratings on the affective components within the sex with partner context.

Evaluation of the three-dimensional model and its components. In the current study, the model (see Figure 1) was reevaluated in a new sample using a between-subjects design for sexual context. Three hypotheses concerning the model were investigated: 1) The three-dimensional model with sensory, evaluative, and affective dimensions and respective components will adequately describe orgasm experiences; 2) the three-dimensional model

will adequately characterize both male and female orgasm, thus suggesting similarities between the two experiences; and 3) component scores will display context-dependent differences, in that the sex with a partner context will be associated with higher scores on the affective and evaluative components than the solitary masturbation context.

One other issue relevant to the sex with a partner context not addressed by Mah and Binik (2000b) concerns the effects of coital versus noncoital forms of stimulation on orgasm experiences. Based on previous work by Newcomb and Bentler (1983) suggesting that coitus may be qualitatively different from noncoital partner sex, a fourth hypothesis was tested with sex with partner groups only: Sex with partner orgasm attained through coitus will be associated with higher scores on the affective-type components than sex with partner orgasm attained through noncoital means.

Finally, a two-dimensional model in which the evaluative and affective dimensions were collapsed into one dimension was evaluated as a plausible alternative model.

Method

Participants

Participants in the study were university students recruited primarily in-class and from a psychology subject pool, through campus advertising, and, with owners' permission, from email LISTSERVs likely to have student members. Those recruited from classes participated in a cash lottery, while those recruited through the subject pool received partial course credit. All participants completed the questionnaires by themselves and were assured of anonymity and confidentiality of responses. Inclusion criteria involved having had orgasm at least once within the sexual context assigned and having 25% or fewer missing adjective ratings. A total of 227 women and 129 men receiving the solitary masturbation questionnaire and 276 women and 166 men receiving the sex with partner questionnaire met these criteria. Table 1 summarizes the sample characteristics. The majority were young, unmarried, heterosexual undergraduate students.

Materials

Questionnaire. The McGill-Mah Orgasm Questionnaire, in Appendix A, consists of a set of 40 adjectives: the 28 adjectives forming the three-dimensional model in Mah and Binik's (2000b) study, and 12 additional adjectives from the original 60-item questionnaire hypothesized to be relevant to sexual contexts but not tested at this time. Individuals rated each adjective on a 0-5 scale (0 = "does not describe it at all", 5 = "describes it perfectly") according to how well it described their most recent orgasm.

Identical forms were developed for the solitary masturbation and sex with partner contexts. The form for the sex with partner context included a section to indicate how orgasm was achieved (see Appendix A2). A scoring form is included in Appendix A3. For the purposes of this study, additional items were also included for both sexual contexts and are listed in Appendices B1-B3. First, individuals in a current relationship were asked to rate on a 0-5 scale three brief items concerning happiness and satisfaction with the relationship and emotional closeness with the partner. Second, two items rated on a 0-5 scale measured physical and emotional intensity of orgasm experience. Third, participants were given a list of anatomical areas and were asked to check off as many as needed to describe location of their orgasm experience. The list included a section for women only, a section for men only, and a section for both men and women.

Statistical Procedure

Prior to analyses, missing values in adjective ratings were replaced using the mean adjective rating for the sex of participant by sexual context with which the particular adjective was associated. In addition to descriptive reliability analyses, the following procedures were used to test the validity-related hypotheses. The 28 adjectives used in Mah and Binik's (2000b) model and analyses were also used in the analyses here.

Most adjective ratings for both sexes and sexual contexts did not show significantly nonnormal univariate distributions, univariate skewness and kurtosis < 2.00. However, three adjectives (pleasurable, fulfilling, satisfying) displayed significantly nonnormal distributions

in expected directions across groups, and multivariate kurtosis was evident. To maintain interpretability of these adjectives relative to all others, transformations were not performed. Confirmatory factor analyses of within-group data included fit indices corrected for nonnormal data. MANOVA is also robust to violations of normality assumptions.

The analytic strategy used to evaluate the two basic hypotheses concerning fit of the three-dimensional model in general and model fit between sexes is summarized here. The remaining analyses will be described in the subsequent sections along with the corresponding results.

Evaluation of the three-dimensional model. Simultaneous confirmatory factor analysis (S-CFA) with maximum likelihood estimation was conducted with the four sex x sexual context groups using EQS for Windows (version 5). The initial analysis was conducted without constraints or model modifications imposed by Mah and Binik (2000b) to establish a baseline level of model fit. Different sets of free parameters were then sequentially constrained to be equal across groups according to a series of nested tests (Bentler, 1995). This tests equality of the model's factor structure, i.e., that the underlying components, dimensions, and their interrelationships are essentially the same across groups. At each test, a multivariate Lagrange Multiplier (LM) test of constraints was performed, and constrained parameters with an associated change in $\chi 2 > 3.84$ ($p < .05$) were released. As typically recommended (e.g., Tabachnick & Fidell, 1996), multiple indices of model fit were examined: the $\chi 2$/df ratio, the goodness of fit index (GFI), the non-normed fit index (NNFI), the incremental fit index (IFI), and the comparative fit index (CFI). These indices have demonstrated relative reliability against sample size effects and violations of multivariate normality (Hoyle & Panter, 1995; Hu & Bentler, 1995). The higher the fit index values and lower the $\chi 2$/df ratio, the better the model fit. Criteria for adequate model fit were for most fit indices $\geq .85$ and $\chi 2$/df ratio < 2.00. Any modifications needed (i.e., to improve fit or to correct problems with individual group model specification) were based on both the multivariate LM test of parameters and theoretical considerations; after each modification, each

model was reevaluated using CFA. Only modifications associated with a significant $\chi 2 > 3.84$ ($p < .05$), were considered for inclusion. Finally, S-CFA was used to test the hypothesis of adequacy of fit of the two-dimensional model across groups first, and then CFA was used to examine model fit within each group.

Results

In the following section, the solitary masturbation context is referred to as "SolM", and the sex with partner context, as "SexP".

Descriptive Characteristics of Orgasm Experiences

The majority of participants (73.1% of women and 90.6% of men for SolM, 56.0% of women and 58.4% of men for SexP) experienced their orgasm 10 days or less before completing the questionnaire. The majority of participants (60.7% of women and 78.3% of men for SolM context, 53.1% of women and 72.0% of men for SexP) also reported an orgasm duration of 10 seconds or less. In the SexP context, orgasm through intercourse alone was reported by 34.2% of women but by 58.2% of men. Women also reported achieving orgasm through manual (21.3%) or oral stimulation from the partner (18.0%) and concurrent clitoral stimulation with vaginal intercourse (12.0%). Men also reported achieving orgasm through oral (18.8%) or manual stimulation from the partner (11.5%).

Reliability Evaluations

Internal consistency of the 28-adjective set, using Cronbach's α, was generally high (women/SolM: $\alpha = .89$; women/SexP: $\alpha = .88$; men/SolM: $\alpha = .92$; men/SexP: $\alpha = .90$). Internal consistency was lower for the components (women/SolM: $\alpha = .79$; women/SexP: $\alpha = .77$; men/SolM: $\alpha = .84$; men/SexP: $\alpha = .80$) and even lower for the dimensions (women/SolM: $\alpha = .66$; women/SexP: $\alpha = .64$; men/SolM: $\alpha = .66$; men/SexP: $\alpha = .63$). Unpublished data on internal consistency of components and dimensions from Mah and Binik's (2000c) study showed a similar pattern of decreasing internal consistency for the components and dimensions (women: αs = .84 and .65, respectively ; men: αs = .87 and .71, respectively).

Intensity and location of orgasm experience

Group differences on orgasm intensity. The mean ratings for Emotional and Physical Intensity are included in Table 2. To test the first hypothesis concerning group differences on intensity of orgasm, a 2 x 2 (Sex x Sexual Context [solitary masturbation, sex with partner]) between-subjects MANCOVA using Pillai's criterion was conducted using SPSS for Windows (version 10). Emotional Intensity and Physical Intensity were DVs, and the relationship satisfaction/emotional closeness variables were covariates. To investigate the impact of each effect on individual DVs, univariate ANCOVAs were then conducted for each DV, and strength of association between the effect and each DV, η^2, calculated. Initial analyses revealed no significant or systematic covariate effects, and so covariates were left out of subsequent analyses.

A significant main effect of Sexual Context was found, $F(2, 781) = 23.40$, $p < .001$, $\eta^2 = .06$. Univariate ANOVAs indicated that both intensity items significantly differed between contexts: Emotional Intensity: $F(1, 782) = 44.34$, $p < .001$; and Physical Intensity: $F(1, 782) = 11.14$, $p = .001$. For both sexes, higher mean intensity ratings for the SexP context were observed (see Table 3), but the effect sizes were small, η^2s = .01-.05. A significant main effect of Sex was also observed, $F(2, 781) = 12.35$, $p < .001$, $\eta^2 = .03$. Univariate ANOVAs revealed that both DVs significantly differed between sexes: Emotional Intensity: $F(1, 782) = 15.62$, $p < .001$, and Physical Intensity: $F(1, 782) = 15.82$, $p < .001$. Table 2 indicates that women had higher average intensity scores, but effect sizes were small, η^2s = .02.

Prediction of Emotional and Physical Intensity. To test the hypothesis concerning the relations between emotional versus physical intensity of orgasm experience and affective versus sensory component scores, separate standard multiple regressions within each group were conducted, one with Emotional Intensity as the DV and the other with Physical Intensity as the DV. In regressing Emotional Intensity, a block with scale scores for all sensory components was entered first, followed by a block with scale scores for all affective

components. In regressing Physical Intensity, a block with scale scores for all affective components was entered first, followed by a block with scale scores for all sensory components.

Emotional Intensity and Physical Intensity correlated between .21-.34 across groups. Results of the regression analyses, summarized in Table 3, indicated that the affective components, Emotional Intimacy and Ecstasy, were significantly predictive of Emotional Intensity for all groups even after the sensory components had been entered in the first step, $ps < .01$ to .001, accounting for 10-27% of the variance across groups. Tests of the individual predictors revealed that Emotional Intimacy was the stronger and more consistent predictor, $ps < .01$ to .001.

Table 3 also reveals that the two affective components significantly and highly predicted Physical Intensity when entered in the first step, $ps < .001$, and uniquely accounted for significant amounts of variance, 13-19%, $ps < .001$. When entered next, the sensory components also significantly and strongly predicted Physical Intensity, $ps < .001$, but their unique contributions to variance, 3-6%, were not significant, $ps = .08$-.21. Tests of individual predictors showed that the following were significant predictors: General Spasms (all except the female/SolM group), $ps < .05$; Emotional Intimacy (male/SexP group), $p = .001$; and Ecstasy (both female groups), $ps < .001$. Effect sizes overall were substantive, η^2s for all step 2's = .16-.33. Upon further examination of correlations between the affective components and Emotional and Physical Intensity, Ecstasy and Emotional Intimacy were more highly correlated with each other than with other variables ($rs = .36$-.58). However, Ecstasy showed higher correlations with a) Physical ($rs = .30$-.43) than Emotional Intensity ($rs = .14$-.29) and b) the sensory components ($rs = .25$-.56) than did either Emotional Intimacy ($rs = .03$-.39) or even Physical Intensity ($rs = .10$-.38). In contrast, Emotional Intimacy had higher correlations with Emotional Intensity ($rs = .33$-.50), though correlations with Physical Intensity were also higher than expected ($rs = .20$-.33).

Location of orgasm sensation. To test the first hypothesis concerning location of orgasm sensation as predicted by sexual context, a series of direct logistic regressions was conducted with each anatomical area as the DV and sexual context as the predictor variable. Following the different subsets in the list of anatomical locations, one set of analyses involved only women, another involved only men, and the third included both men and women. Data from the male and female groups were analyzed separately in the third set of analyses. In the analyses for women, clitoris and vulva (outer genitals) were grouped to form one item, as were vagina (near surface or outer part of it) and vagina (deeper inside). In the analyses for men, penis and testes formed one item. Finally in the analysis for both sexes, "centered deep inside" and "centered in whole pelvic area", "centered in other parts of body only" and "centered in whole body", and "spread to other parts of body" and "spread to whole body" were grouped to form respective single items. Both hierarchy of location of sensation (genitals, pelvic area, body) and localization versus spreading of sensation were thereby differentiated. Coding, however, remained dichotomous to enable standardized comparison across areas: Endorsement of either one or both anatomical areas was coded "1", and nonendorsement of both was coded "0".

Table 4 summarizes the results concerning prediction of location of orgasm sensation by sexual context. For almost all of the areas, the differences in endorsement proportions between sexual contexts were small, and prediction by sexual context did not reach the critical α significance level of .01. Sexual context did significantly predict endorsement of "centered around outer genitals" for women, χ^2 (1, $\underline{N}$ = 502) = 8.29, $\underline{p}$ = .004. The endorsement/nonendorsement ratios and B coefficients indicated that women in the SolM group were more likely than those in the SexP group to endorse "centered around outer genitals".

To test the second hypothesis concerning associations between location of sensation and the sensory components of the model, a similar series of direct logistic regressions was conducted with each anatomical area as the DV and all sensory component scores entered

simultaneously as the predictor variables. For these analyses, the following were considered to reflect localization of sensation: of the areas, clitoris/vulva and vagina(surface/deeper inside), penis/testes and deeper inside (behind penis/testes), "centered around outer genitals", and "started in outer genitals but then spread deeper"; and of the sensory components, Building Sensations, Spurting Sensations and Pulsating Sensations. The remaining areas and components were considered to convey diffusion of sensation. Data from the four sex x sexual context groups were analyzed separately.

Table 4 includes the results of these analyses. The sensory components together only significantly predicted "spread to whole pelvic area" for men, χ^2 (8, $\underline{N}$ = 129) = 23.19, $\underline{p}$ = .003. Looking at individual predictors, though, scores on particular sensory components were generally predictive of endorsement of particular areas in the expected directions, $\underline{p}s$ < .001. For example, Flooding Sensations, a component thought to convey diffusion of sensation, was significantly and positively associated with women's endorsement of uterus, whole pelvic area, and "spread to whole pelvic area" according to the direction of the B coefficients. Throbbing Sensations was significantly and positively related to men's endorsement of deeper inside (behind penis/testes) for the SolM context. On the other hand for women in the SexP context, General Spasms, thought to indicate diffusion, was significantly and positively predictive of vagina (surface/deeper inside), while Spurting Sensations, thought to reflect localization, was positively predictive of "centered in other parts of body/whole body". For men in the SexP context as well, Spurting Sensations was found to be negatively associated with "started in outer genitals but then spread deeper".

Further exploratory analyses were conducted to investigate whether the proportion of participants endorsing each anatomical area was significantly different from random endorsement rates. For each group, a $\chi 2$ analysis was conducted for each area to test the null hypothesis of equal proportion of endorsements and non-endorsements (the equality model). For both the logistic regressions and $\chi 2$ analyses conducted. all findings associated with an α

level of .05 are reported, but because of the large number of analyses conducted, only findings with an α level of .01 or lower were considered significant.

Table 4 reveals significant differences in proportion of endorsements from random endorsement for all female anatomical areas, $\chi 2$s = 32.73-138.27, ps < .001. Most women endorsed clitoris/vulva and vagina (outer part/deeper inside) but not uterus or whole pelvic area. Endorsement of two male areas, penis/testes and whole pelvic area, also significantly differed from random endorsement, $\chi 2$s = 15.70-75.90, ps < .001. Most men endorsed penis/testes but not the whole pelvic area. In all groups, significant differences from the equality model were seen for the following areas, $\chi 2$s = 11.97-191.43, p < .001: "centered around outer genitals", "centered deep inside/in whole pelvic area", "spread to whole pelvic area", and "centered in other parts of body/whole body". Most participants did not endorse these areas. Men in the SexP group were also less likely to endorse "spread to other parts of body/to whole body", $\chi 2$ (1, N = 166) = 6.17, p = .01.

Relationship Satisfaction and Emotional Closeness

To test the hypothesis concerning the association between relationship factors and ratings on the affective components within the sex with partner groups, separate multiple regression analyses were conducted for each sex, with the affective component scale scores as the DVs and ratings of relationship happiness, relationship satisfaction, and emotional closeness to partner as the predictors. Results indicated that ratings on the relationship variables significantly predicted scores on the Emotional Intimacy component for both men, $F(3, 74) = 6.79$, $p < .001$, $\eta^2 = .22$, and women, $F(3, 162) = 6.17$, $p = .001$, $\eta^2 = .10$. The proportion of the DV variance accounted for (the η^2s) was significant for both, $p \leq .001$, and adjusted R^2 was .18 for men and .09 for women. Looking at the relationship variables individually, relationship satisfaction was a just-significant predictor for men, $\beta = .32$, $p = .06$, while relationship happiness was significantly predictive for women, $\beta = .39$, $p = .001$. The relationship ratings were also significantly predictive of Ecstasy for men, $F(3, 74) = 3.47$, $p = .02$, $\eta^2 = .12$, but not for women, $F(3, 162) = 2.46$, $p = .07$, $\eta^2 = .04$. The

proportion of the DV variance accounted for (the η^2s) was significant for men, $p = .02$, and adjusted R^2 was .09 for men. No significant individual relationship predictor, though, was noted for men, but relationship satisfaction was significantly predictive for women, $\beta = .24$, $p = .03$.

Evaluation of the Three-Dimensional Model and Its Components

General fit of the model across sex/sexual context groups. Table 5 summarizes the results of model fitting, with each step and associated model numbered sequentially. The baseline model (model 1A) showed a $\chi 2/df$ ratio < 2.00, and all fit indices ranged from .84 to .87.

Two problems were noted, however: 1) The unique variance for Flushing Sensations attained negative variance for the female groups, and 2) the covariance between the Evaluative and Affective dimensions was overly correlated for the female/SexP group (cf. Mah & Binik, 2000b). Table 6 summarizes the model modifications added to individual group models. For both female groups, fixing the unique variance for Flushing Sensations to a minimum, 0.01, resolved the first problem. Allowing the unique variances for Relaxation and Emotional Intimacy to correlate in the female/SexP model, reflecting greater psychological satisfaction associated with orgasm attained through activities like coitus with greater emotional arousal (cf. Mah & Binik, 2000b) resolved the second problem. Other modifications considered conceptually reasonable were added to the SexP groups model to reach the fit cutoff criterion (see Table 6). No modifications were added for the male/SolM group, as most indices were above .90.

Table 6 shows that after modifications, individual group models (labeled model B) reached fit criteria. The GFI consistently yielded the lowest values, and fit indices were also lower for the SexP groups. Figure 2 shows the standardized parameter estimates for each of the groups, excluding modifications. Parameter estimates for all adjective loadings, component-dimension regressions, dimension-dimension correlations, and error variances were highly significant (ps < .01-.001), and standard errors were generally small. Parameter

estimates for the unique variances for components and their standard errors were more variable, with some estimates not attaining significance. For the female/SolM group, the Sensory-Evaluative correlation was the highest, $\underline{r} = .52$; for the female/SexP and male/SolM groups, the Evaluative-Affective correlation was the highest, $\underline{r}s = .96$ and .59, respectively; and for the male/SexP group, the Sensory-Affective correlation was the highest, $\underline{r} = .73$.

When reevaluated using S-CFA, the baseline model with modifications (model 1B in Table 5) showed improved fit over the nonmodified model. Table 5 summarizes the subsequent sequence of tests of parameter constraints (models 2-6). For purposes of readability, fit indices are shown only for the final modified model at the end of each test. Constraints on sensory-type items were more often released to vary than evaluative- or affective-type items at the most stringent test levels, the unique variances of components (model 5A) and the error variances of adjectives (model 6B). Two other findings were noted: 1) The unique variance for Flushing Sensations had to be fixed to .01 for both male groups (model 6A), as with the female groups during model modification; and 2) the LM test identified a significant $\chi 2$ change (predicted $\Delta\chi 2 = 3.94$, $\underline{p} = .047$) by allowing the error variance for "peaceful" to vary between the female/SolM and male/SolM groups, but actual change was nonsignificant (model 6B, modification 6). The constraint was still released, as the next one released, regression of General Spasms on the Sensory dimension, showed the predicted significant $\chi 2$ change.

The final model obtained (Table 5, model 6B, modification 7) yielded a $\chi 2/df$ ratio of 1.68 and most fit index values at .89; the GFI again showed the lowest value. Parameter estimates for all adjective loadings, component-dimension regressions, dimension-dimension covariances, and error variances again were significant ($\underline{p}s < .01$), standard errors generally remained small, and estimates for the unique variances of the components and their standard errors were more variable. In all cases, the Evaluative-Affective correlation was the highest, $\underline{r}s = .52$ (SolM groups)-.93 (female/SexP group). Average standardized residuals ranged from .06 (both female groups) to .08 (male/SolM group).

Simultaneous fit of the alternative two-dimensional model across groups is also summarized at the bottom of Table 5 (model 7). While most fit indices were within cutoff, the same problem with the unique variance for Flushing Sensations initially found with the female groups occurred for male groups. Fixing this unique variance to 0.01 resolved the negative variance (Table 5, model 7A). Individual group fit of the two-dimensional models (including ψFlushing Sensations = 0.01 for men), summarized in Table 6 as model C for each group, was generally comparable to that of the nonmodified baseline three-dimensional models for men and the baseline three-dimensional models with ψFlushing Sensations = 0.01 for women.

Context-dependent differences across component and dimension scale scores. To test the hypothesis of context-dependent differences across component scores, simple scale scores for each component were first created by summing ratings of its respective adjectives with unit weighting. For each dimension, simple scale scores were also created by summing component scale scores with unit weighting. A 2 x 2 (Sex x Sexual Context) between-subjects MANCOVA using Pillai's criterion was performed, with scale scores for all components as the DVs and relationship happiness/satisfaction and emotional closeness with partner as covariates. To investigate the impact of each effect on individual DVs, univariate ANCOVAs were conducted, and strength of association between the effect and each DV, η^2, calculated. To evaluate the dimension scores, the same analysis was conducted with the scale scores for the three dimensions as the DVs. Table 7 lists the mean scale scores and scores adjusted for covariates for the 10 components and three dimensions of the model. None of the sociodemographic variables or orgasm variables examined was related to particular scale scores systematically or to any great effect. None of the covariates also had any significant or systematic effect on the components or dimensions and hence was not included in subsequent analyses.

A significant main effect of Sex was observed on component scores, $F(10, 785) = 42.78$, $p < .001$, $\eta^2 = .35$. As indicated in Table 7, univariate ANOVAs revealed that scores

for all sensory-type components significantly differed between sexes: Building Sensations, $F(1,794) = 5.30$, $p = .02$; Flooding Sensations, $F(1,794) = 4.16$, $p = .04$; Flushing Sensations, $F(1,794) = 27.74$, $p < .001$; Spurting Sensations, $F(1,794) = 177.64$ $p < .001$; Throbbing Sensations, $F(1,794) = 13.48$, $p < .001$; and General Spasms, $F(1,794) = 26.62$, $p < .001$. In all cases except for Spurting Sensations, women had higher scores. However, only the effect for Spurting Sensations demonstrated any substantive effect size, $\eta^2 = .18$; effect sizes for the remaining components were very small, with none being higher than .03.

A significant main effect of Sexual Context was also found for component scores, $F(10, 785) = 29.25$, $p < .001$, $\eta^2 = .27$. As indicated in Table 7, univariate ANOVAs revealed that scores for all evaluative- and affective-type components, as well as Spurting Sensations and General Spasms, significantly differed between sexual contexts: Spurting Sensations, $F(1,794) = 8.18$ $p = .004$; General Spasms, $F(1,794) = 13.18$, $p = .02$; Pleasurable Satisfaction, $F(1,794) = 23.50$, $p < .001$; Relaxation, $F(1,794) = 16.16$, $p < .001$; Emotional Intimacy, $F(1,794) = 194.60$, $p < .001$; and Ecstasy, $F(1,794) = 31.82$, $p < .001$. Mean scores for Spurting Sensations, General Spasms, Pleasurable Satisfaction, Emotional Intimacy, and Ecstasy were higher in the SexP context, whereas the mean scores for Relaxation were lower for the SexP context. Only the effect for Emotional Intimacy demonstrated any substantive effect size, $\eta^2 = .20$; none of the effect sizes for the remaining components were higher than .04.

For the dimension scores, only a significant main effect of Sexual Context was observed, $F(3, 792) = 70.21$, $p < .001$, $\eta^2 = .21$. As apparent in Table 7, univariate ANOVAs revealed significant differences in favour of the SexP context for the Sensory, $F(1,794) = 9.24$, $p = .002$, and Affective dimensions, $F(1,794) = 145.39$, $p < .001$, but only the Affective dimension showed any substantive effect size, $\eta^2 = .16$. The effect size for the Sensory dimension was $\eta^2 = .01$.

Oneway (Coital Status) MANCOVAs with Pillai's criterion were used to investigate the hypothesis of differences between coital and noncoital orgasm attained within the sex with

partner context. Scale scores for all components were DVs, and the relationship variables served as covariates; separate analyses were conducted for each sex. Participants who indicated they had achieved orgasm through intercourse were compared to those who indicated they had attained orgasm either through oral or manual stimulation from the partner or manual stimulation from themselves. Comparison of coital versus noncoital sex with partner orgasm involved highly reduced sample sizes including only SexP participants reporting either coital or noncoital orgasm and providing ratings on the relationship variables. No significant effect of Coital Status was obtained for either sex, but univariate ANCOVAs did reveal a significant effect for Emotional Intimacy for both men, $F(1, 69) = 7.32$ $p = .01$, and women, $F(1, 114) = 4.71$, $p = .03$. Men and women reporting orgasm through intercourse had significantly higher scores on Emotional Intimacy (Ms[SEs] = 16.94[0.75] and 18.06[0.83], respectively) than men and women reporting orgasm through noncoital means (Ms[SEs] = 12.94[1.26] and 15.62[0.75], respectively). Effect sizes were generally small, η^2s = .04-.10.

Discussion

Reliability of the McGill-Mah Orgasm Questionnaire

Overall, the McGill-Mah Orgasm Questionnaire shows promising psychometric characteristics as a theory-driven measure of the orgasm experience. Findings indicate good internal consistency of the adjective set. Because reliability is related to the number of independent measures of a construct, the lower reliability noted with higher-order constructs like the components and dimensions would be expected with the decreasing number of constructs at these levels (i.e., there are 28 adjectives, but only 10 components and three dimensions). On the other hand, the lower reliabilities may also reflect the increasing amount of differentiation among constructs at these levels (i.e., dimensions are conceptually more distinct from each other than are adjectives). Yet the dimensions are still moderately related, suggesting they are measuring different qualities, but of the same construct of orgasm experience. Because both the current study and the previous study by Mah and Binik (2000b)

only investigated single orgasm experiences for each sexual context, further studies of test-retest reliability are needed. These evaluations of the measure's stability might be anticipated to yield lower reliability with increasing time not only because of decline in memory effects, but also because female orgasm experience is reported to vary over time (e.g., Butler, 1976). We would also expect to find a similar trend for men, given some available data (e.g., Hite, 1981).

Validity of the McGill-Mah Orgasm Questionnaire

Orgasm intensity. Intensity of orgasm sensation can be conceptualized as involving distinct emotional and physical elements. Contrary to our hypothesis, orgasm attained through sex with a partner appears to be both emotionally and physically more intense than masturbatory orgasm, though the difference is small. Orgasm attained through sex with a partner may involve more widespread sensations that are still perceived as physically intense because they involve more of the body. Intense emotional experiences occurring at that time might also amplify the subjective strength of physical sensations.

Though the effect was small, women did tend to report higher emotional and physical intensity, a finding consistent with an overall trend for women having higher scores on most of the model components (cf. Mah & Binik, 2000b). Whether this reflects a sex difference in actual intensity of orgasm versus a sex difference in response style is unclear. Outside of sex research, data on sex differences in self-reported emotional intensity and expressivity are conflicting (e.g., Deffenbacher et al., 1996; Grossman & Wood, 1993; Pines & Friedman, 1998; Searle & Meara, 1999; Seidlitz & Diener, 1998); controlling for covariates like autobiographical recall (Seidlitz & Diener, 1998) and endorsement of gender stereotypes of emotional responsiveness (Grossman & Wood, 1993) typically resulted in absence of sex differences. Having participants rate additional items on a relatively neutral topic like food tastes might help evaluate the effects of the emotional valence of the adjectives and/or the topic of orgasm on the sex differences observed.

Feelings of emotional intimacy were associated with emotional intensity of orgasm as expected, whereas ecstasy was more related to physical intensity and physical sensations. Singer's (1973) concept of the "uterine orgasm" and Hite's (1976) anecdotal reports of "emotional orgasm" also link physical and emotional aspects of female orgasm. Mah and Binik (2000b) found that the Sensory dimension was more strongly correlated with the Affective than Evaluative dimension and attributed this to a heightened sense of intimacy or ecstasy from the more whole-body sensory experiences associated with sex with a partner (cf. Clifford, 1978; Fisher, 1973; Hite, 1976). Emotional intimacy may not be related qualitatively with ecstasy to a high degree because the former may reflect experiences occurring post-orgasm rather than during orgasm. It should also be noted that relations between affective qualities and intensity of orgasm may be quite modest within the general population. In this study, though, only two items were used to measure emotional and physical intensity of orgasm sensation; a more elaborate measure of orgasm intensity may yield stronger findings.

Location of orgasm sensation. Sexual context for the most part did not appear to be strongly related to location in which orgasm sensation was reportedly felt. The only notable finding was that sensations of female masturbatory orgasm were more centered in the outer genitals as hypothesized than female orgasm through sex with a partner. The modest sexual context differences are in line with the reported lack of physiological differences in female orgasms induced through different means (cf. Masters & Johnson, 1966). Individual sensory components thought to reflect localization versus diffusion of orgasm sensation were generally related to the corresponding anatomical areas in which orgasm was reportedly felt. These findings lend support to the construct validity of the components. At the same time, some of these components may convey qualitative variation in the same sensation across different situations. For example, with female orgasm attained through sex with a partner, vaginal sensations were associated with reports of general spasms, but not spurting sensations. One explanation would thus be that female orgasm through sex with a partner

does encompass throbbing sensations, but localization in the vagina rather than the outer genitals injects a deeper, more pervasive quality additionally represented by the sensation of general spasms. With male orgasm attained through sex with a partner, orgasm sensation appears to start in the genitals but then deepens. This more pervasive experience was associated with a diminished sense of spurting sensations, which we believe reflect ejaculatory sensations. This would suggest that ejaculatory sensations are not as noticeable when men achieved orgasm through sex with a partner. Some relations that were anticipated either did not reach the critical significance level or were not detected. For example, orgasm localized in the outer genitals conceivably involves throbbing and spurting sensations, but this was not the case for either sex. Future evaluation studies should involve concurrent genitopelvic and extra-genital measures to corroborate or elaborate upon the observed relations between the sensory components and location of orgasm sensations.

On the whole, most people localized orgasm sensation in the genitals, and women also reported orgasm sensation in the vagina but not in either the uterus or the pelvic region; men also were less likely to indicate pelvic involvement. Interestingly, orgasm sensation for both sexes was not likely to remain centered in the genitals, pelvic area, or the body or to spread to the pelvic area. Male orgasm attained through sex with a partner was also less likely to involve spreading of sensation to the body. What are striking are some of the nonsignificant findings for male orgasm: Contrary to Masters and Johnson's (1966) genital-focused descriptions, men were as likely as not to indicate that their orgasm sensation 1) began in the genitals but then spread deeper, and 2) spread to parts of the body. Thus, the reductionist emphasis on genital and ejaculatory processes within the literature on male orgasm is not supported by these data.

Relationship factors. The role of relationship factors in the affective experience of sex with partner orgasm, particularly feelings of intimacy, was supported and is in line with the consistently observed associations between relationship factors and reported orgasm quality and satisfaction for women (Mah & Binik, 2000a). Interestingly, these findings were

somewhat more prominent for men than women, contrary to the widespread belief of male orgasm as physiologically driven and female orgasm as psychologically/psychosocially influenced. Uncontrolled self-reports on male multiple orgasm suggest that interpersonal conditions are critical (e.g., Dunn & Trost, 1989).

The findings concerning relationship factors may also be relevant to the wide disparity in reported sensations between clitorally and vaginally induced orgasm noted by some investigators (e.g., Butler, 1976). We suggest that variation in the degree of relationship happiness or satisfaction could underlie the disparity by determining how satisfying coital orgasm relative to masturbatory orgasm. For example, we might hypothesize that the greater the degree of relationship happiness and satisfaction, the more vaginally induced orgasm will be reported to involve pervasive, psychologically satisfying experiences. However, the causal effect of relationship variables remains tentative due to the correlational design of the study; it is plausible that affective experiences during or after orgasm may contribute to relationship satisfaction.

The three-dimensional model. The reliability of the three-dimensional model as a functional description of the human orgasm experience and adjective ratings as a valid approach to measuring orgasm experiences was corroborated. While a true cross-validation would entail replication of the original model under the within-subjects paradigm used by Mah and Binik (2000b), our finding that fit of an equivalent model was robust to evaluation in an independent sample and change in methodological design provides strong evidence. That the same model could describe experiential data from men and women also agrees with the previously observed similarity between male and female orgasm experiences in the literature (e.g., Hite, 1976, 1981; Vance & Wagner, 1976) and findings cited throughout this study as well as in Mah and Binik (2000b). However, male and female orgasm experiences are not identical. Meaningful differences found in this study as well as Mah and Binik's (2000b) study could conceivably reflect sex differences in physiological events. For example, the sex difference observed within the Spurting Sensations component may be attributed to male

ejaculatory sensations. Another interesting difference is that in the individual models for the sex with partner context, overall orgasmic pleasure and satisfaction for women was more related to and perhaps even dependent upon the affective qualities of orgasm, whereas overall affective experience in male orgasm showed a stronger relationship with the physical qualities of orgasm. One interpretation is that within interpersonal sexual conditions, female orgasm is more psychologically or emotionally driven, whereas male orgasm remains more physically salient, with the affective components providing an index of the quality or intensity of the physical events of orgasm. This would conform to stereotypical perspectives apparent within the literature (Mah & Binik, 2000a). However, the female model also included a link between feelings of ecstasy and diffusion of physical sensations of orgasm.

The expected sexual-context differences were found in affective experiences, particularly feelings of intimacy, arguing for the potential of the greater psychosexual and emotional qualities of the sex with partner context to influence the orgasm experience. The major sex difference that was observed concerned the construct thought to convey ejaculatory sensations. The lack of strong sexual-context differences in the remaining sensory components is consistent with the noted lack of differences in the physiological events of masturbatory versus coital orgasm (e.g., Masters & Johnson, 1966) and Mah and Binik's (2000b) finding of the same adjectives from different contexts grouping into the same sensory components. The sexual-context effects with the Sensory and especially Affective dimensions, coupled with the lack of an effect with the Evaluative dimension, also suggests that while orgasm through sex with a partner differs qualitatively from masturbatory orgasm, both are nonetheless appreciated as pleasurable and satisfying. Only when specific components are examined will any, generally modest differences in reported pleasure/satisfaction appear between these two experiences. This finding also upholds the conceptual merit of the three-dimensional over the two-dimensional model, as the different effects of sexual context at the dimensional level would not have been discernible with the latter.

As Newcomb and Bentler's (1983) typology of female orgasmic responsiveness would suggest for orgasm attained through sex with a partner, emotional intimacy was greater when orgasm was attained through coital versus noncoital means even when relationship factors are taken into account. These findings must be qualified by the small size of effect, however, and sample sizes were greatly reduced in this set of analyses.

Methodological Issues

Some methodological limitations within this correlational study should be noted. The sample in the current study was limited to young university students. The design involved retrospective self-report and may be compounded by social desirability or response faking. Moreover, attempts to convey feelings and sensations using adjectives are limited by individual verbal capacity and meanings ascribed to words. The relatively small sample sizes, especially for males, may also influence reliability of the findings.

Because of the study design, the three-dimensional model contains fewer adjectives than Mah and Binik's (2000b) model. Many of the sensory components were measured only by two adjectives, and there were fewer components loading onto the Evaluative and Affective dimensions. Internal consistency of intra-component adjectives is consequently likely to be lower than in the previous study, as reliability is related to number of measurement items. The less reliable unique variance estimates for components and the negative variances for Flushing Sensations are doubtless a consequence of this issue. Future studies should involve larger samples to permit evaluations of an elaborated model in which each component is measured by a greater number of adjectives.

The higher fit index values found in comparison to the previous study can be attributed to design differences. In Mah and Binik's (2000b) study, taking into account the within-subjects design improved fit indices to levels comparable to those in the current study. That the GFI consistently yielded the smallest fit values may be explained by the approach to fit assessment of particular indices. The GFI measures the proportion of variance accounted for by the model, whereas the other indices compare fit of the proposed model to that of an

independence model in which variables are completely unrelated. Thus, the GFI entails the more difficult task and hence is probably more conservative especially with large numbers of variables, whereas the independence model would rarely fit observed data.

Conclusion

The McGill-Mah Orgasm Questionnaire appears promising as both a research and clinical assessment tool, and the evidence warrants further reliability, validity, and clinical studies. Studies of concurrent validity should also be conducted from a biopsychological perspective, in which the scale is administered in conjunction with physiological measures of orgasm as well as other self-report measures of constructs theoretically correlated with particular components. These types of studies may lead to elaboration of the three-dimensional model through the addition of other important aspects of the orgasm experience.

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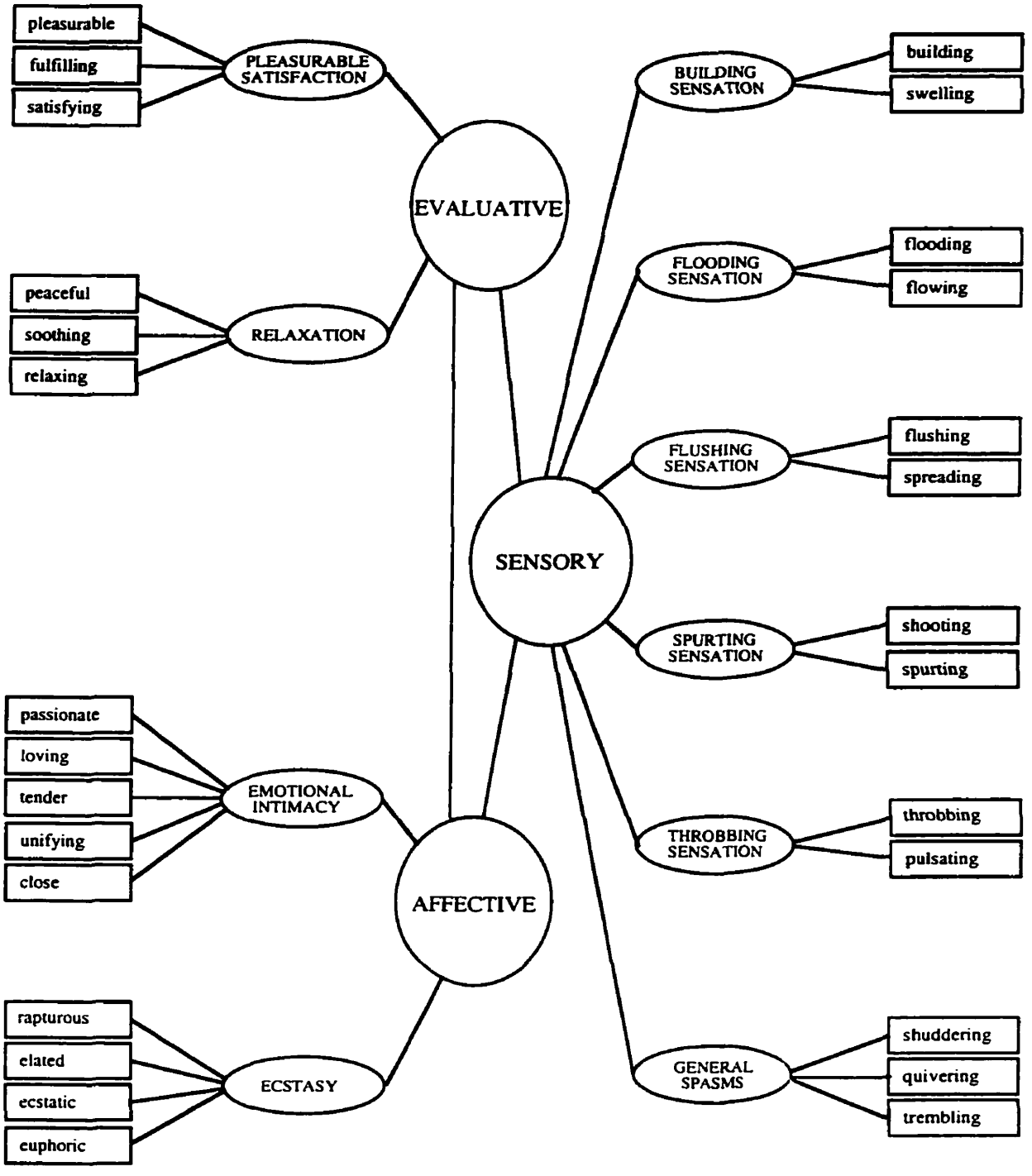
Figure Caption

Figure 1. The Three-Dimensional Model of the Psychological Experience of Orgasm.



Note: The 28 adjectives are presented within the rectangular boxes, the 10 components are represented by the small ovals, and the three dimensions are represented by the large ovals. Adjectives form the lowest level construct in the model hierarchy (measured variables), while the dimensions form the highest level construct. Lines between the dimensions indicate relations among the dimensions. Lines between components and adjectives and between dimensions and components indicate that the higher-level construct is defined by the lower-level constructs connected to it.

Table 1

Demographic Characteristics of Analyzed Sample

	Participants			
	Solitary Masturbation		Sex with Partner	
Demographics	female (n = 227)	male (n = 129)	female (n = 276)	male (n = 166)
	M(SD)			
Age	22.95(7.28)	23.03(6.47)	22.15(5.60)	24.54(8.11)
	Proportion			
Student status				
undergraduate	77.53	72.09	76.08	71.08
graduate	9.25	15.50	10.51	15.06
missing	13.22	12.40	12.68	13.86
Religion				
Catholicism	32.16	28.68	32.61	31.33
Protestantism	16.74	10.08	13.77	12.05
Judaism	13.66	17.05	15.22	17.47
Islam	0.88	4.65	0.72	4.82
other	6.17	13.18	10.14	9.64
no religion	19.38	16.28	19.20	18.67
missing	11.01	10.08	8.33	6.02
Primary sexual orientation				
heterosexual	79.74	81.40	82.97	86.14
homosexual	3.08	5.43	2.54	4.82
bisexual	4.85	3.10	6.16	3.01
missing	12.33	10.08	8.33	6.02
Relationship status				
single	30.40	46.51	29.35	43.98

with partner, not living together	36.56	31.01	47.10	33.73
living together/ married	14.54	9.30	12.68	13.86
other	7.49	3.10	2.90	2.41
missing	11.01	10.08	7.97	6.02
Previous Study Participation				
yes	2.64	0.76	4.35	3.01
no	87.22	91.47	91.30	90.36
missing	10.13	7.75	4.35	6.63

Table 2

Mean Ratings for Emotional Intensity and Physical Intensity and Ratings Adjusted for Covariates

Intensity (DV)	Groups						
	F/SolM (n = 227)	E_{SC}[1]	F/SexP (n = 276)	E_{Sx}[1]	M/SolM (n = 129)	E_{SC}[1]	M/SexP (n = 166)
	M(SD) / M(adjusted)						
Emotional	3.26(1.28)/3.31	< ***	3.97(1.06)/4.20	> ***	3.04(1.16)/2.93	< ***	3.50(1.21)/3.74
Physical	3.46(1.09)/3.57	< **	3.80(0.97)/3.87	> ***	3.24(1.03)/3.19	< **	3.41(1.11)/3.64

[1] E_{SC} indicates direction of significant DV differences between sexual contexts (within each sex); E_{Sx} indicates direction of significant DV differences between sexes. F = female, M = male, SolM = solitary masturbation context, SexP = sex with partner context.

*** $p < .001$. ** $p = .01$-$.001$.

Table 3

Summary of Standard Multiple Regression Analyses for Predicting Emotional and Physical Intensity

Predicting Emotional Intensity				Predicting Physical Intensity			
Variables In Regression Equation and Significance for Each Entry	B(SE)	β	sr^2	Variables Entered and Significance for Each Entry	B(SE)	β	sr^2
				female/solitary masturbation			
Step 1: F(6, 217) = 2.68*	--	--	.07	Step 1: F(2, 222) = 25.91***	--	--	.19
Building Sensations	0.04(0.04)	.09		Emotional Intimacy	-0.01(0.01)	-.08	
Flooding Sensations	0.04(0.04)	.10		Ecstasy	0.10(0.02)		
Flushing Sensations	0.05(0.04)	.10				.47***	
Spurting Sensations	0.05(0.04)	.11					
Throbbing Sensations	-0.02(0.04)	-.04					
General Spasms	-0.02(0.02)	-.09					
Step 2: F(8, 215) = 5.26***	--	--	.10	Step 2: F(8, 216) = 8.06***	--	--	.04
Building Sensations	0.03(0.03)	.06		Emotional Intimacy	-0.01(0.01)	-.07	
Flooding Sensations	-0.01(0.04)	-.03		Ecstasy	0.08(0.02)		
Flushing Sensations	0.02(0.04)	.05		Building Sensations	0.03(0.03)	.37***	
Spurting Sensations	0.02(0.04)	.04		Flooding Sensations	0.02(0.03)	.08	
Throbbing Sensations	<|0.01|(0.04)	<|.01|		Flushing Sensations	<|0.01|(0.03)	.04	
General Spasms	-0.04(0.02)	-.14		Spurting Sensations	<|0.01|(0.03)	-.01	
Emotional Intimacy	0.04(0.02)	.20**		Throbbing Sensations	0.06(0.03)	.01	
Ecstasy	0.06(0.02	.23**		General Spasms	0.01(0.02)	.13	
						.05	
R = .41				R = .48			
R^2 = .16				R^2 = .23			
adj. R^2 = .13				adj. R^2 = .20			

female/sex with partner

Step 1: F(6, 264) = 0.82	--	--	.02	Step 1: F(2, 268) = 20.24***	--	--	.13
Building Sensations	<|0.01|(0.03)	.01					
Flooding Sensations	0.04(0.03)	.11		Emotional Intimacy	0.01(0.01)	.08	
Flushing Sensations	-0.04(0.03)	-.09		Ecstasy	0.07(0.01)	.32***	
Spurting Sensations	-0.01(0.03)	-.03					
Throbbing Sensations	-0.02(0.03)	-.04					
General Spasms	0.03(0.02)	.12					
Step 2: F(8, 262) = 10.38***	--	--	.22	Step 2: F(8, 262) = 6.18***	--	--	.03
Building Sensations	<|0.01|(0.03)	.01		Emotional Intimacy	0.01(0.01)	.09	
Flooding Sensations	<|0.01|(0.03)	-.01		Ecstasy	0.05(0.02)		
Flushing Sensations	-0.06(0.03)	-.14*		Building Sensations	<|0.01|(0.02)	.27***	
Spurting Sensations	-0.03(0.03)	-.08		Flooding Sensations	-0.01(0.02)	-.01	
Throbbing Sensations	- 0.01(0.03)	-.03		Flushing Sensations	-0.01(0.03)	-.03	
General Spasms	0.01(0.02)	.04		Spurting Sensations	<|0.01|(0.02)	-.02	
Emotional Intimacy	0.07(0.01)			Throbbing Sensations	<|0.01|(0.02)	-.01	
Ecstasy	0.04(0.02)	.43***		General Spasms	0.04(0.02)	.01	
		.16*				.18**	
R = .49				R = .40			
R^2 = .24				R^2 = .16			
adj. R^2 = .22				adj. R^2 = .13			

male/solitary masturbation

Step 1: F(6, 120) = 0.68	--	--	.03	Step 1: F(2, 125) = 11.51***	--	--	.16
Building Sensations	0.04(0.05)	.11					
Flooding Sensations	-0.02(0.05)	-.06		Emotional Intimacy	0.02(0.02)	.14	
Flushing Sensations	-0.03(0.05)	-.06		Ecstasy	0.07(0.02)	.30**	
Spurting Sensations	-0.08(0.05)	-.19					
Throbbing Sensations	0.03(0.05)	.07					
General Spasms	0.02(0.04)	.08					

Step2: F(8, 118) = 2.99**	--	--	.14
Building Sensations	<|0.01|(0.05)	.01	
Flooding Sensations	-0.05(0.05)	-.13	
Flushing Sensations	-0.05(0.05)	-.11	
Spurting Sensations	-0.04(0.05)	-.08	
Throbbing Sensations	-0.01(0.05)	-.03	
General Spasms	<|0.01|(0.04)	.01	
Emotional Intimacy	0.08(0.02)	.41**	
Ecstasy	0.02(0.03)	* .07	
R = .41			
R^2 = .17			
adj. R^2 = .11			

Step 2: F(8, 119) = 4.19***	--	--	.06
Emotional Intimacy	0.02(0.02)	.13	
Ecstasy	0.05(0.03)	.21	
Building Sensations	-0.05(0.04)	-.13	
Flooding Sensations	<|0.01|(0.04)	<|.01|	
Flushing Sensations	-0.03(0.04)	-.09	
Spurting Sensations	-0.01(0.04)	-.02	
Throbbing Sensations	0.04(0.04)	.12	
General Spasms	0.07(0.03)	.28*	
R = .39			
R^2 = .16			
adj. R^2 = .14			

male/sex with partner

Step 1: F(6, 157) = 1.57	--	--	.06
Building Sensations	0.10(0.04)	.23*	
Flooding Sensations	-0.02(0.05)	-.03	
Flushing Sensations	-0.04(0.05)	-.08	
Spurting Sensations	-0.05(0.05)	-.13	
Throbbing Sensations	-0.06(0.05)	-.13	
General Spasms	0.05(0.03)	.17	

Step 1: F(2, 162) = 14.20***	--	--	.15
Emotional Intimacy	0.04(0.01)	.26**	
Ecstasy	0.05(0.02)	.21**	

Step2: F(8, 155) = 9.46***	--	--	.27
Building Sensations	0.06(0.04)	.14	
Flooding Sensations	-0.06(0.04)	-.13	
Flushing Sensations	-0.05(0.04)	-.11	
Spurting Sensations	-0.03(0.04)	-.06	
Throbbing Sensations	-0.08(0.04)	-.16	
General Spasms	0.01(0.03)	.02	
Emotional Intimacy	0.08(0.01)	.46**	
Ecstasy	0.06(0.02)	*	
		.24**	
R = .57			
R^2 = .33			
adj. R^2 = .29			

Step 2: F(8, 156) = 5.05***	--	--	.06
Emotional Intimacy	0.04(0.01)	.26**	
Ecstasy	0.02(0.02)	.08	
Building Sensations	-0.03(0.04)	-.07	
Flooding Sensations	-0.02(0.04)	-.05	
Flushing Sensations	<|0.01|(0.04)	-.01	
Spurting Sensations	0.01(0.04)	.03	
Throbbing Sensations	0.05(0.04)	.11	
General Spasms	0.06(0.03)	.23*	
R = .45			
R^2 = .21			
adj. R^2 = .17			

Note: B's and β's < .01 or < -.01 are indicated as <|0.1|.
*** < .001. ** .01-.001. * < .05-.01 >

Table 4

Predicting Endorsement of Location of Orgasm Sensation from Sexual Context, Differences from Equality Model of Endorsement, and Associations with Sensory Components.

Anatomical Area (DV)	Proportion of Endorsements			Ratio of Endorsements / Nonendorsements Between Sexual Context[1]		B(SE) (sexual context)	$B(SE)^2$ (sensory components)
	SolM	SexP	Total	SolM	SexP		
women only (n = 501)							
clitoris/vulva (outer genitals)	88.50	81.82	84.83†	7.69	4.50	0.54(0.26)	--
vagina (surface/outer part/ vagina (deeper inside)	74.34	81.09	78.04†	2.90	4.29	-0.39(0.22)	F/SexP: GSp = 0.14(0.05)**
uterus	12.83	14.55	13.77†	0.15	0.17	-0.15(0.26)	F/SexP: Fld = 0.19(0.08)**
whole pelvic area	30.97	30.90	30.94†	0.45	0.45	0.00(0.19)	F/SolM: Fld = 0.19(0.08)**
men only (n = 295)							

penis/testes (outer genitals)	88.37	77.71	82.37†	7.60	3.49	0.78(0.33)	--
deeper inside (behind penis/ testes)	48.84	56.02	52.88	0.95	1.27	-0.29(0.24)	M/SolM: Thr = 0.23(0.09)**
whole pelvic area	32.56	28.31	30.17†	0.48	0.39	-0.20(0.26)	--
both sexes (n_{women} = 502, n_{men} = 295)							
centered around outer genitals							
women	38.50	26.45	31.87†	0.63	0.36	0.55(0.19)**	--
men	25.58	25.30	25.42†	0.34	0.34	0.02(0.27)	
started in outer genitals but then spread deeper							
women	49.56	45.65	47.41	0.98	0.84	0.16(0.18)	M/SexP: Sp = -0.22(0.08)**
men	43.41	48.80	46.44	0.77	0.95	-0.22(0.24)	
centered deep inside/centered in whole pelvic area							
women	17.70	19.93	18.92†	0.22	0.25	-0.15(0.23)	--
men	13.18	22.29	18.31†	0.15	0.29	-0.64(0.32)	

spread to whole pelvic area							
women	19.03	25.36	22.51†	0.23	0.34	-0.37(0.22)	F/SolM: Fld = 0.23(0.09)**
men	14.73	15.06	14.92†	0.17	0.18	-0.03(0.33)	
centered in other parts of body/centered in whole body							F/SexP: Sp = 0.25(0.09)**
women	3.98	9.06	6.77†	0.04	0.10	-0.88(0.40)	
men	5.43	10.84	8.47†	0.06	0.12	-0.75(0.46)	
spread to other parts of body/spread to whole body							M/SolM: Bd = -0.26(0.10)**
women	57.52	51.09	53.98	1.35	1.04	0.26(0.18)	
men	51.16	40.36†	45.08	1.05	0.68	0.44(0.24)	

[1]Ratio of Endorsements to Nonendorsements: ratios > 1.00 indicate more endorsements than nonendorsements; ratios < 1.00 indicate more nonendorsements than endorsements. [2]Bd = Building Sensations, Fld = Flooding Sensations, Sp = Spurting Sensations, Thr = Throbbing Sensations, GSp = General Spasms; F = female, M = male, SolM = solitary masturbation context, SexP = sex with partner context.

** .01-.001. †Endorsement rate significantly different from equality model, $p < .01$.

Table 5

Steps in Testing Equality of Confirmatory Model Factor Structure Across Groups

Competing models	$\chi 2$	df	$\chi 2$/df	NNFI	CFI	IFI	GFI
1A. Baseline 12-component / 3-dimensional model ®	2168.55	1156	1.88	.85	.87	.87	.84
1B. Baseline 12-component / 3-dimensional model with individual group modifications (from Table 7)	2068.07	1152	1.80	.87	.88	.89	.84
2. Factor loadings constrained to be equal across groups	2130.97	1198	1.78	.87	.88	.88	.84
2A. Constraints released:							
1. passionate ∋ Emotional Intimacy (F/SolM, M/SexP)	2106.38	1197	1.76	.87	.88	.89	.84
2. pleasurable ∋ Pleasurable Satisfaction (F/SolM, M/SexP)	2101.46	1196	1.76	.87	.89	.89	.84
3. spreading ∋ Flushing Sensations (F/SolM, M/SolM)	2097.30	1195	1.76	.87	.89	.89	.84
3. Factor variances-covariances constrained to be equal across groups	2107.96	1202	1.75	.88	.89	.89	.84
3A. Constraints released:							
1. EVALUATIVE--AFFECTIVE (F/SexP, M/SexP)	2102.08	1201	1.75	.88	.89	.89	.84
4. Factor-factor regressions constrained to be equal across groups	2134.91	1227	1.74	.88	.89	.89	.84
4A. Constraints released:							
1. Spurting Sensations ∋ SENSORY (F/SolM, M/SexP)	2128.30	1226	1.74	.88	.89	.89	.84
2. tender ∋ Emotional Intimacy (F/SexP, M/SexP)	2123.98	1225	1.73	.88	.89	.89	.84
5. Disturbance variances-covariances constrained to be equal across groups	2177.65	1250	1.74	.88	.88	.88	.83
5A. Constraints released:							
1. ψRelaxation (F/SolM, M/SolM)	2167.76	1249	1.74	.88	.88	.88	.84
2. ψGeneral Spasms (F/SolM, M/SolM)	2158.99	1248	1.73	.88	.88	.89	.84

3. 4. ψGeneral Spasms (F/SolM, M/SexP)	2148.20	1247	1.72	.88	.89	.89	.84
flowing ϶ Flooding Sensations (F/SolM, F/SexP)	2143.50	1246	1.72	.88	.89	.89	.84
5. ψPulsating Sensations (F/SolM, M/SexP)	2138.92	1245	1.72	.88	.89	.89	.84
6. Pleasurable Satisfaction ϶ EVALUATIVE (F/SolM, F/SexP)	2134.86	1244	1.72	.88	.89	.89	.84
6. Error variances-covariances constrained to be equal across groups ®	2240.63	1319	1.70	.88	.88	.88	.83
6A. ψFlushing Sensations = 0.01 (M/SolM, M/SexP)	2240.68	1321	1.70	.88	.88	.88	.83
6B. Constraints released:							
1. εflushing (F/SolM, M/SolM)	2231.23	1320	1.69	.89	.88	.88	.83
2. εflooding (F/SolM, F/SexP)	2224.91	1319	1.69	.89	.89	.89	.83
3. εshudder (F/SolM, F/SexP)	2220.20	1318	1.68	.89	.89	.89	.83
4. εthrobbing (F/SolM, M/SolM)	2214.85	1317	1.68	.89	.89	.89	.83
5. fulfilling ϶ Pleasurable Satisfaction (F/SolM, M/SexP)	2210.34	1316	1.68	.89	.89	.89	.83
6. εpeaceful (F/SolM, M/SolM)	2206.81	1315	1.68	.89	.89	.89	.83
7. General Spasms ϶SENSORY (F/SolM, F/SexP)	2202.70	1314	1.68	.89	.89	.89	.83
Alternative models							
7. Basic 12-component / 2-dimensional model ®	2196.35	1162	1.89	.85	.87	.87	.83
7A. Basic 12-component / 2-dimensional model, ψFlushing Sensations = 0.01 (M/SolM, M/SexP)	2196.76	1164	1.89	.85	.87	.87	.83

Note: Each modified model includes the preceding modifications; ε = error variance associated with adjectives, ψ = disturbance associated with DV components; ϶ = regression coefficient between an adjective and component or between a component and dimension. F and M = female and male, respectively; SolM and SexP = solitary masturbation context and sex with partner contexts, respectively. Words in lowercase denote adjectives; words with first letters in uppercase denote components; and words in all uppercase denote dimensions. All $\chi 2$ and CFI values are not corrected for nonnormal data.

® variance of $\psi < 0.00$.

Table 6

Individual Baseline and Modified Baseline Three-Dimensional Model Fit with Two-Dimensional Model Comparison

Competing models	$\chi 2$	df	$\chi 2$/df	NNFI	CFI	IFI	GFI
			female/solitary masturbation				
A. Basic 12-component/ 3-dimensional model ®	395.70	241	1.64	.89	.92	.90	.87
Modifications:							
1. ψFlushing Sensations = 0.01	398.00	242	1.64	.89	.91	.90	.87
B. Final baseline modified model	398.00	242	1.64	.89	.91	.90	.87
C. Basic 12-component/ 2-dimensional model	403.33	243	1.66	.88	.91	.90	.87
			female/sex with partner				
A. Basic 12-component/ 3-dimensional model ©®	663.09	337	1.97	.82	.87	.84	.83
Modifications:							
1. ψFlushing Sensations = 0.01 ©	665.70	338	1.97	.82	.87	.84	.83
2. ψRelaxation--ψEmotional Intimacy	655.85	337	1.95	.83	.87	.85	.84
3. passionate ɜ Ecstasy	637.02	336	1.90	.84	.88	.86	.84
4. tender ɜ Relaxation	627.06	335	1.87	.84	.88	.86	.84
5. ψEcstasy--ψGeneral Spasms	618.98	334	1.85	.85	.88	.87	.85
B. Final baseline modified model	618.98	334	1.85	.85	.88	.87	.85
C. Basic 12-component/2-dimensional model	677.38	340	1.99	.82	.86	.84	.83
			male/solitary masturbation				
A. Basic 12-component/ 3-dimensional model	292.55	241	1.21	.92	.95	.93	.84

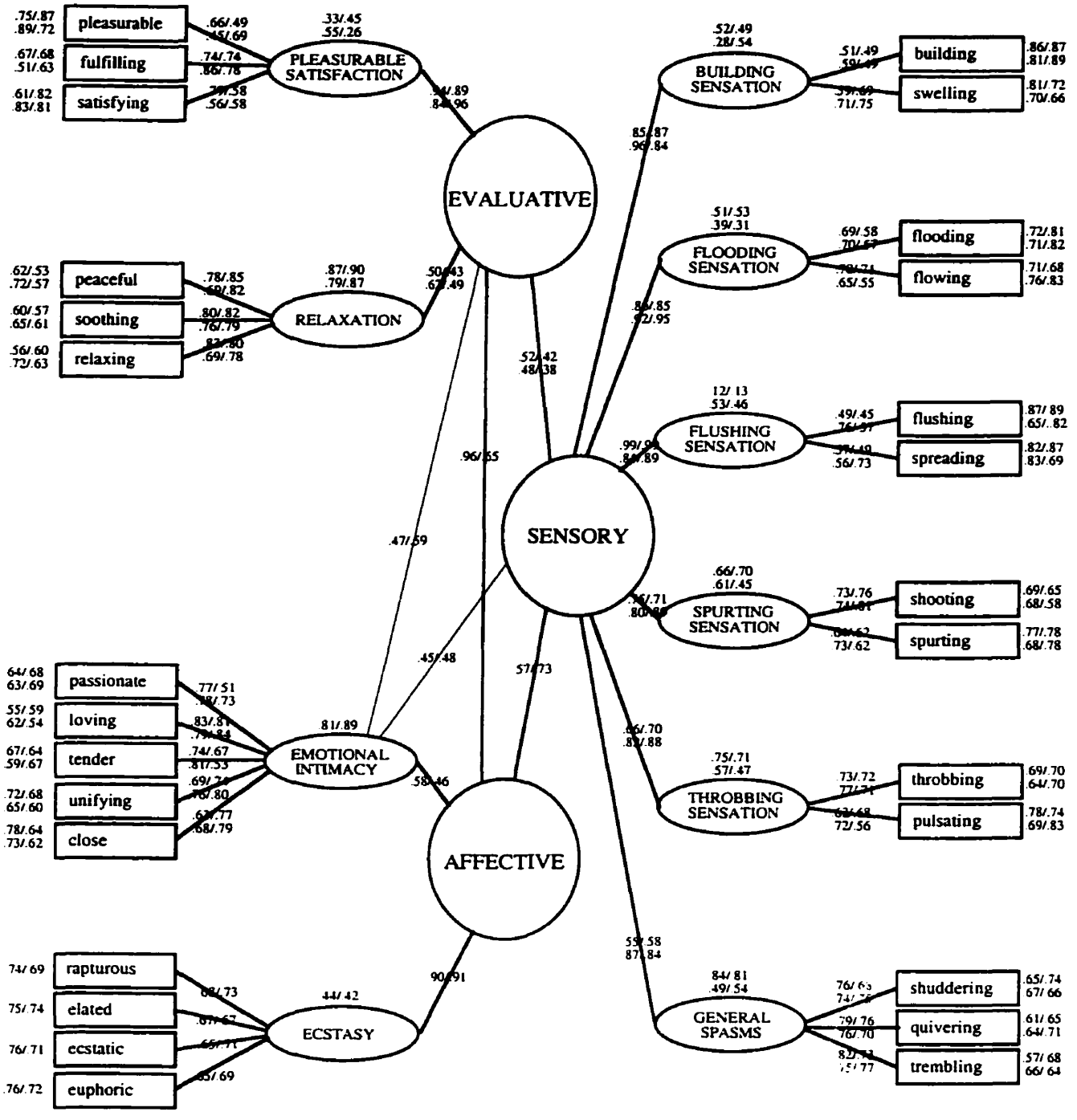
C. Basic 12-component/ 2-dimensional model	295.21	242	1.22	.92	.95	.93	.84
			male/sex with partner				
A. Basic 12-component/ 3-dimensional model	549.24	337	1.63	.83	.87	.86	.79
Modifications:							
1. ψRelaxation--ψEmotional Intimacy	536.59	336	1.60	.84	.88	.86	.80
2. tender ɜ Relaxation	515.74	335	1.54	.86	.89	.87	.80
B. Final baseline modified model	515.74	335	1.54	.86	.89	.87	.80
B. Basic 12-component/ 2-dimensional model	559.84	339	1.65	.83	.86	.85	.79

Note: ψ = unique variance associated with DV components; ɜ = regression coefficient between an adjective and component or between a component and dimension. Words in lowercase denote adjectives; words with first letters in uppercase denote components; and words in all uppercase denote dimensions. All $\chi 2$ and CFI values are corrected for nonnormal data.

©correlation between Evaluative and Affective dimensions > 1.00. ®variance of ψ < 0.00.

Figure Caption

Figure 2. Standardized Parameter Estimates for Individual Groups in the Three-Dimensional Model.



Note: All parameters with four numerical values, the parameter estimates, display estimates for each group in the following order: first line--female/SolM, female/SexP; second line--male/SolM, and male/SexP. All parameters with two estimate values display estimates for the female/SexP and male/SexP models in that order. Correlations between Emotional Intimacy and the Sensory and Evaluative dimensions are those for the female/SolM and male/SolM models in that order. The 28 adjectives are presented within the rectangular boxes, the 10 components are represented by the small ovals, and the three dimensions are represented by the large ovals. Adjectives form the lowest level construct in the model hierarchy, while the dimensions form the highest level construct. Lines between the dimensions indicate correlations between the dimensions. Lines between components and adjectives and between dimensions and components indicate regressions of the lower level construct on the higher level construct. The sets of values at these lines are the corresponding parameter estimates (e.g., the values indicated at each of the lines between dimensions are the correlations between the dimensions).

Table 7

Mean component and dimensional scale scores and scores adjusted for covariates for each group

Components	F/SolM (n = 227)	E_{SC}[1]	F/SexP (n = 276)	E_{Sx}[1]	M/SolM (n = 129)	E_{SC}[1]	M/SexP (n = 166)
			Groups: M(SD) / M(adjusted)				
Pleasurable Satisfaction	11.78(2.90)/11.66	< ***	12.59(2.41)/12.80		11.30(2.52)/11.05	< ***	12.37(2.63)/12.83
Relaxation	8.33(4.27)/8.55	> ***	6.97(4.56)/7.22		8.74(3.61)/8.52	> ***	7.54(4.44)/7.50
Emotional Intimacy	7.93(6.39)/7.50	< ***	14.95(6.73)/16.27		7.68(6.26)/7.72	< ***	14.14(6.64)/16.00
Ecstasy	9.63(5.05)/9.18	< ***	11.93(4.69)/12.41		9.71(4.62)/9.43	< ***	11.40(4.78)/12.44
Building Sensations	4.87(2.77)/4.99		4.89(2.79)/4.73	> *	4.11(2.84)/4.13		4.71(2.76)/5.14
Flooding Sensations	4.78(2.82)/4.69		4.97(2.95)/4.92	> *	4.21(2.83)/4.39		4.70(2.57)/4.65
Flushing Sensations	4.89(2.67)/4.85		5.34(2.52)/5.32	> ***	4.05(2.65)/3.93		4.13(2.73)/4.14

Spurting Sensations	2.80(2.61)/2.73	< **	3.23(2.74)/3.18	< ***	5.36(2.78)/5.50	< **	6.09(2.93)/6.54
Throbbing Sensations	6.70(2.61)/6.82		6.64(2.76)/6.55	> ***	5.69(2.75)/5.48		6.19(2.56)/6.38
General Spasms	8.52(4.45)/8.38	< *	9.34(4.12)/9.22	> ***	6.62(4.09)/6.57	< *	8.05(4.06)/9.23
Dimensions							
SENSORY	32.55(12.23)/32.47	< **	34.41(12.17)/34.11		30.03(13.82)/30.00	< **	33.86(13.22)/36.09
EVALUATIVE	20.11(6.06)/20.21		19.56(5.74)/20.01		20.04(5.04)/19.57		19.91(5.96)/20.33
AFFECTIVE	17.56(10.17)/16.68	< ***	26.88(9.84)/28.68		17.39(9.55)/17.14	< ***	25.55(9.48)/28.44

[1] E_{SC} indicates direction of significant DV differences between sexual contexts (within each sex); E_{SX} indicates direction of significant DV differences between sexes.
*** $p < .001$. ** $p = .01$-$.001$. * $p < .05$-$.01$>.

Appendix A

A1. McGill-Mah Orgasm Questionnaire, Solitary Masturbation Form.

Recall to the best of your ability the most recent orgasm you experienced during **solitary masturbation**. This would include any sexual activity in which you engaged while alone.

(section below is identical for both sexual context forms)

Below is a list of words that might be used to describe the experience of orgasm. Different people may use different words to describe their personal experience, and so there is no "right" answer. After each word, write the number that best indicates how well that word describes your most recent orgasm experienced through [**solitary masturbation/sex with a partner**]. If you have never had an orgasm in this way, please place an **x** on this line ___ and rate the words according to how you think orgasm experienced through [**solitary masturbation/sex with a partner**] would feel.

To rate each of the words below, use the following scale. **Please rate all of the words; do not skip any.**

0	**1**	**2**	**3**	**4**	**5**
does not describe it at all					**describes it perfectly**

absorbed	__	blissful	__	building	__	close	__	ecstatic	__
elated	__	engulfing	__	euphoric	__	exciting	__	exploding	__
flooding	__	flowing	__	flushing	__	fulfilling	__	hot	__
immersing	__	loving	__	passionate	__	peaceful	__	pleasurable	__
pulsating	__	quivering	__	rapturous	__	relaxing	__	rising	__
satisfying	__	shooting	__	shuddering	__	soothing	__	spreading	__
spurting	__	swelling	__	tender	__	throbbing	__	trembling	__
uncontrolled	__	unifying	__	unreal	__	warm	__	wild	__

A2. McGill-Mah Orgasm Questionnaire, Sex With Partner Form.

Recall to the best of your ability the most recent orgasm you experienced during **sex with a partner**. This would include any sexual activity in which you had orgasm while your partner was there.

1. To the best of your memory, how did you have this orgasm? (circle letter)

a. through intercourse (vaginal/anal/other) b. through oral stimulation from partner
c. through manual stimulation from partner d. through manual stimulation from myself
e. other (describe briefly on line, e.g., clitoral stimulation/vaginal intercourse at same time)

(see 1A, solitary masturbation form for remaining section)

A3. Scoring the McGill-Mah Orgasm Questionnaire.

Simple scale scores for each component: sum adjective ratings for each adjective to obtain a total score.

Sensory components:

Building Sensations:	building + swelling = __
Flooding Sensations:	flowing + flooding = __
Flushing Sensations:	flushing + spreading = __
Spurting Sensations:	spurting + shooting = __
Throbbing Sensations:	throbbing + pulsating = __
General Spasms:	shuddering + trembling + quivering = __

Affective components:

Emotional Intimacy:	close + loving + passionate + tender + unifying = __
Ecstasy	ecstatic + elated + euphoric + rapturous = __

Evaluative components:

Pleasurable Satisfaction:	pleasurable + satisfying + fulfilling = __
Relaxation:	relaxing + peaceful + soothing = __

Simple scale scores for each dimension: sum total scores for each component from above to obtain a total score.

Sensory dimension:

Building Sensations + Flooding Sensations + Flushing Sensations +
Spurting Sensations + Throbbing Sensations + General Spasms = __

Affective dimension:

Emotional Intimacy + Ecstasy = __

Sensory dimension:

Pleasurable Satisfaction + Relaxation = __

Appendix B

B1. Items Measuring Relationship Factors.

If you are currently in a relationship: for the next three questions, write down the number that best describes your answer on the line after each question. Please use numbers from the following scale to indicate your rating:

0	1	2	3	4	5
very low/ very little					**very high/ very much**

a. How would your rate your **happiness** with your current relationship? __

b. How would you rate your **satisfaction** with your current relationship? __

c. How would you rate how **emotionally close** you are to your current partner (i.e., **how much do you love your current partner**?)? __

B2. Items Measuring Physical and Emotional Intensity Of Orgasm.

For the next two questions, write down on the line provided the number that you feel best describes how intense this orgasm was. Please use the following scale:

0	1	2	3	4	5
very weak					**very strong**

a. During this orgasm, you may have experienced physical sensations throughout your body (e.g., spasms, throbbing, tension). How intense were these physical sensations overall? __

b. During or after orgasm, you may have experienced other feelings that were more psychological rather than physical (e.g., satisfaction, feelings of peacefulness or relaxation, ecstasy, love). How intense were these nonphysical feelings overall? __

B3. Items Measuring Location of Orgasm Sensation.

Please indicate below the parts of your body in which you experienced this orgasm by placing an x on the line beside the body parts that apply. Indicate as many of the body parts as you feel will accurately describe this orgasm. Different people will experience orgasm in many different ways, and so there is no "right" answer. We are only interested in how you experienced this orgasm.

(For women only)

I felt my orgasm in my
__clitoris
__vulva (outer genitals)
__vagina (near the surface or outer part of it)
__vagina (deeper inside)
__uterus
__whole pelvic area

(For men only)

I felt my orgasm in my
__penis
__testes
__deeper inside, behind my penis/testes
__whole pelvic area

(For both men and women)

My orgasm feelings
__centered around my outer genitals (around my clitoris/vulva/outer vagina, penis/testes) only
__started in my outer genitals but then spread deeper
__centered deep inside (my inner vagina/uterus, behind my penis/testes) only
__centered in my whole pelvic area only
__spread to my whole pelvic area
__centered in other parts of my body (e.g., legs, abdomen) only
__spread to other parts of my body
__centered in my whole body
__spread to my whole body

Author Note

Kenneth Mah, Department of Psychology, McGill University, Montreal, Quebec, Canada. Yitzchak M. Binik, Departments of Psychology, McGill University and Royal Victoria Hospital, Montreal, Quebec, Canada.

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Correspondence concerning this article should be addressed to Yitzchak M. Binik, Ph.D., Department of Psychology, McGill University, 1205 Dr. Penfield Ave., Montreal, Quebec, Canada H3A 1B1.

General Discussion and Directions for Future Research

Overall, the results of the preceding two empirical studies supported a three-dimensional model of the psychological experience of orgasm involving sensory, evaluative, and affective dimensions and their respective components. The components demonstrated variability in expected ways when compared between two sexual contexts in which orgasm was attained. Both male and female orgasm could be described with this model, and findings emphasized the similarities as well as differences between sexes. Using adjective ratings to measure the subjective orgasm experience appears to be a simple and effective approach to gathering data for descriptive and hypothesis-testing purposes. We discuss some methodological issues arising from the two empirical studies and then suggest future research directions addressing measurement, validity, and clinical issues.

Methodological Issues

One of the main problems in research on the psychology of orgasm is the necessary reliance on self-report methods. Although crucial for understanding psychological phenomena, retrospective self-report data are subject to inherent biases/distortions related to memory, demand characteristics, social desirability, etc., especially with such a personally loaded issue as sexuality. One of the main recruitment strategies in the two empirical studies was in-class data collection. To reduce discomfort with participation, efforts were made to normalize sex research, to justify the objectives of the study, and to acknowledge people's discomfort with completing such a questionnaire, and participants were not asked to give identifying information. To reduce the conspicuousness of those who have had less sexual experience but who were still willing to complete the questionnaire, instructions indicated that those who have not experienced orgasm should nonetheless rate the adjectives to convey how individuals thought orgasm would feel. However, the presence of other students does diminish the sense of privacy, would probably maintain some level of discomfort in individuals, and consequently

increase nonparticipation rates. Estimated response rates using this strategy of recruitment were highly variable, though, ranging from 0% to about 80%. Factors that seemed to promote response rate include soliciting participation at the beginning instead of at the end of a class, the presence of the professor during solicitation, and positive verbal interest in the study from the professor.

Efforts were made to recruit students with a wide range of characteristics and interests and from a wide range of disciplines within the student population. Disciplines targeted on-campus include psychology, sociology, religious studies, women studies, biology, chemistry, physics, architecture, engineering, computer sciences, economics, anthropology, history, art history, classics, English, and languages. A range of LISTSERV discussion groups and sites was also targeted: graduate students in psychology and biology, research psychology; neuropsychology, neurophysiology, and physiology; computer sciences and Internet/World Wide Web support; sexual education and information; and "current issues". The proportions of gay and lesbian participants in both studies are consistent with the estimated percentages of homosexual individuals within the general population, approximately 5-10% (e.g., Janus & Janus, 1993, pp. 69-70). Janus and Janus (1993, p. 403) reported a greater number of Protestant over Catholic individuals in their sample, which corresponded to relative proportions within the U.S. population. In our two studies, however, a greater number of participants reported a Catholic rather than Protestant background, a finding attributable to the prominence of Catholicism in Quebec. However, religious background did not appear to have a major or systematic influence in the results. Janus and Janus (1993) also noted few differences in sexuality variables across religion and concluded that contemporary religion overall did not preclude experiencing and enjoying different sexual activities.

Measurement Issues

Measurement issues are critical in the elaboration of the adjective-ratings approach and the three-dimensional model is needed, . The two empirical studies conducted

evaluated a basic model in which many sensory components were measured by only two adjectives. Similarly in the second study, the evaluative and affective dimensions comprised only two components or even one component. Hence, larger-scale studies should be conducted in which each component is represented ideally by at least four to six adjectives (e.g., Bornstedt, 1983). Incorporating more measures per construct would not only ensure identification of the CFA model tested, but enhance internal consistency of the measures for all components of the model. Using the original 60-adjective scale from the first study rather than the truncated version used in the second study is recommended for this purpose.

Validity. Validity of the model components and dimensions should receive continued attention. Studies evaluating construct validity should involve both elaboration of the three-dimensional model and investigations into theoretical issues that have been notable in the literature. Future validity studies should make elaboration of the three-dimensional model a priority. Studies of orgasm have often taken a piecemeal approach, where different mechanisms have been measured and explored in isolation. As apparent in the literature review, even within the same basic perspective (e.g., the physiological perspective), wide disparity in the mechanisms considered essential to human orgasm (e.g., different genital or pelvic mechanisms) and little integration of information are evident. In contrast, a more holistic approach was taken in the first empirical study as a more advantageous one. Several initial constructs were extracted simultaneously to ascertain their interrelationships immediately and to develop as comprehensive a model of the orgasm experience as possible. The model, however, was constrained by factors such as sample size and participants' difficulties with rating a large number of adjectives. Future studies should focus on identification of other potentially important constructs of the orgasm experience, such as those relating to the altered states of consciousness

phenomenon (Davidson, 1980), for inclusion in the three-dimensional model. The theoretical, semantically based model in Table 1 of Mah and Binik's (2000a) first study offers possible candidates for evaluation.

While generally consistent with the literature, the findings presented in this thesis are applicable to a young student population that may have had relatively little relationship and sexual experience compared to the general population. Thus, future studies should confirm the applicability of the adjective-rating questionnaire and the associated three-dimensional model in the general population. These should include discriminant-validity studies of the adjective-ratings scale. For example, more rigorous studies should be conducted including other sexual contexts in which women have reported experiencing orgasm, e.g., imagery (cf. Whipple et al., 1992), breast stimulation (cf. Masters & Johnson, 1966), and G-spot stimulation (cf. Sevely & Bennett, 1978). Studies should evaluate the extent to which, for example, the questionnaire can distinguish between different groups of women who report having definitely experienced orgasm, who indicate uncertainty as to whether they have experienced orgasm, who have definitely never experienced orgasm and are asked to rate adjectives according to how they think orgasm would feel, and who are asked to rate their highest point of sexual arousal instead of orgasm. Presumed differences between successive orgasms in multiple orgasm experiences might also be evaluated in this respect. Should the discriminant validity of the adjective-ratings questionnaire be demonstrated, the model may provide information for better defining the concept of "orgasm".

Assuming psychometric adequacy of the adjective-ratings approach and the three-dimensional model within the general population, the greater psychosocial and psychosexual variability in the general population would permit better investigations of potentially important relationships between particular model components/dimensions and a diversity of variables: age (including the elderly); amount of relationship experience and degree of satisfaction; amount of sexual experience, repertoire of sexual behaviours such

as amount and variety of foreplay, and degree of sexual arousal and excitement versus anxiety during sex; and in women, parity, hormonal status, and menstrual status (both across the menstual cycle and across pre- and post-menopausal periods), to name but a few issues important in the literature. As a specific example, it would be interesting to compare both men and women within casual relationships or who engage in casual sex versus those who are in committed relationships and whether this is associated with dominance of sensory- versus affective-type experiences during orgasm and thereby physical versus psychological satisfaction. Newcomb and Bentler's (1983) three dimensions of female orgasmic responsiveness (masturbatory, partner present/non-coital, coital) also imply qualitative differences in orgasm attained through sex with a partner without coitus versus with through coitus.

From the biopsychosocial perspective, evaluation of the adjective-ratings approach and the three-dimensional model would entail studies involving concurrent objective (e.g., anal contractions, cf. Bohlen, Held, & Sanderson, 1980; Bohlen, Held, Sanderson, & Ahlgren, 1982; heart and respiration rate; hormonal assay; central nervous system activity) and self-report measures (e.g., adjective ratings) while sexual stimulation is occurring. Immediately post-orgasm, participants would be asked to complete the adjective-ratings scale to describe their experience. Associations between particular objective measures and theoretically related components of the model would provide concurrent validity information. Not only would this basic paradigm largely control for the effects of retrospective reporting inherent to using only self-report measures, but it is a flexible model with which many different experimental effects and issues could be evaluated, e.g., effects of the presence versus absence of visual sexual stimulation during self-stimulation on perceived physical intensity of orgasm, and the concordance of objective and subjective measures. The potential limitations of laboratory studies in investigating affective experiences, though, should be recognized (see Mah & Binik, 2000b).

Clinical Issues

Clinical issues concerning the orgasm experience are of particular interest. In the DSM-IV (American Psychiatric Association, 1994), absence of orgasm following normal sexual excitement and causing marked distress or interpersonal difficulty currently merits a diagnosis of sexual dysfunction in both women (Female Orgasmic Disorder) and men (Male Orgasmic Disorder). While these clinical entities reflect social norms about what consitutes "normal" sexuality, they also underline the importance of orgasm in human sexuality. Understanding the mechanisms involved in typical orgasm functioning, including detailed knowledge about subjective experiences, may invaluably enhance clinical research and practice in several key areas: conceptualization and empirical validation of clinical entities, the development of effective interventions targeting particular difficulties, and design and validation of treatment-outcome studies.

The current lack of a standardized means of assessing changes in subjective orgasm experience in detail, coupled with the prevalence of "all-or-nothing" assessment of orgasm (e.g., is orgasm present or not? How often? Is orgasm satisfying or not? Is there pain or not?), may obscure understanding of why these changes have occurred and make tailoring of effective treatment plans more difficult. Further studies of the adjective-rating approach to describing orgasm should examine associations between reported orgasm difficulties as a function of different problems and scores on the adjective-rating questionnaire. If score profiles on the components or dimensions of the three-dimensional model are found to distinguish between orgasm difficulties secondary to medical (e.g., neuropathic processes) versus psychosocial issues (e.g., marital or sexual dissatisfaction), for example, such information would support the use of the adjective-rating questionnaire and model in clinical screening/diagnosis and treatment planning.

Some of the research outlined previously with respect to the general population have implications for clinical issues. The patterns in scores between different components as a function of different sexual and psychosocial variables would hold clinical

implications, for example for identifying possible sources of of orgasmic dysfunction, sexual dissatisfaction, and asymmetry in desired frequency of sex within couples and for enhancing sexuality in the aged. Clinical populations reporting difficulties with orgasm should also receive direct attention. For example, the literature on hysterectomy outcomes suggests benefits not only in medical, but also psychosocial and sexual outcomes for the subtotal (uterus excised, cervix left intact) over the standard total hysterectomy procedure (both uterus and cervix excised). However, the few studies that address the issue of efficacy of subtotal versus total hysterectomy are currently small-scale and include no control comparison groups. The lack of a measure of orgasm experiences has also made it difficult to understand the impact of hysterectomy on orgasm functioning. Research on this issue has important clinical implications for gynecological surgical practice. Because of the relatively young age of many hysterectomy patients, sexuality and post-operative sexual adjustment remains a vital issue within this population. This study and subsequent studies will add information which may allow patients to better understand the sexual outcomes they can expect. In addition, if this research can provide more rigorous evidence for the relative efficacy of subtotal hysterectomy in medical, sexual, and psychosocial outcomes, more widespread acceptance of this surgically less complicated procedure would be beneficial to gynecological patients who must undergo such procedures.

Another much-needed clinical direction involves male orgasm. Men whose orgasm has been affected by medication with sexual side effects involving orgasm, men who experience premature ejaculation, and men who are undergoing difficulties within relationships, and men who have chronic medical conditions such as diabetes in which neuropathy may affect sexual functioning may all report differences in the orgasm experience. However, as previously mentioned, almost no research, clinical or otherwise, exists on the psychological experience of male orgasm. It would be of interest to investigate whether men experiencing difficulties with orgasm as a function of different conditions such as side effects of medications versus marital

issues will demonstrate distinct patterns of ratings within components of the three-dimensional model beyond presence or absence of ejaculation. For example, men with more physiologically based difficulties, e.g., due to medication, disease, or surgical effects, might demonstrate different rating profiles on specific sensory-type components, whereas men experiencing more psychosocially based difficulties, e.g., relationship issues, might show profile differences within the emotion-based components. Men who report ejaculation without the usual cognitive/emotional experiences (i.e., anhedonic ejaculation, a rare condition) might also report the usual sensory-type experiences but low scores on components reflecting the cognitive/emotional aspects and overall may not label these experiences as "orgasm". Hence, the adjective-ratings scale may serve as an initial screening or diagnostic tool once patterns within the three-dimensional model associated with different kinds of difficulties can be ascertained.

Conclusion

The main thrust of this thesis was to address the lack of descriptive research on the subjective orgasm experience and develop an instrument to further progress in this area. Understanding the psychological experience of orgasm is relevant to conceptualizations of pleasure and can provide a concrete foundation for exploring more abstract questions such as the psychophysiology of altered states of consciousness (Davidson, 1980). Ultimately we hope that the adjective-ratings scale and the three-dimensional model of the core constructs of the orgasm experience will be useful within the context of biopsychosocial research on human orgasm.

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APPENDICES

Appendix A

Orgasm Questionnaire, Pilot Study

--Cover letter: The Experience of Orgasm

--General Sociodemographic Information

--Checklist One, Checklist Two

THE EXPERIENCE OF ORGASM

Orgasm is an intense, personal event most of us desire. Moreover, not only people in general, but professionals from a wide range of fields, such as psychologists, physicians, novelists, and journalists, have been arguing for years about the nature of orgasm; whether there are different "types" of orgasm; whether there are individual as well as gender differences in the experience; and whether such differences influence sexual desire or satisfaction with one's sexual relationship. Yet past research efforts to answer these questions have been unsatisfactory. We would like to collect systematic data from healthy individuals in order to begin exploring these questions. To enable our more rigorous investigation of these issues, our initial objective is to compile a standard vocabulary which people can use to describe their experience of orgasm.

Enclosed are a set of questionnaires which we ask you to complete as best you can. After you have filled out the questionnaires, **please return them in the envelope provided to the primary investigator. Even if you choose not to fill out them out, we would very much appreciate it if you would still return the blank questionnaires in the envelope to the primary investigator.**

Note that your participation is totally voluntary, and your participation or nonparticipation will not affect your performance in your course at all. You can refuse to answer any of the questions asked. Your responses will remain totally anonymous and confidential, and you are not asked to give your name or any other kind of identifying information. Because we wish to provide complete anonymity, no consent form is included for you to sign. Instead, your consent will be indicated by your voluntarily filling out the questionnaires and returning them in the envelope provided.

Should you have any further questions or concerns regarding the questionnaires or this study, please do not hesitate to contact the primary investigator.

Thank you very much for your time.

Sincerely,

Primary Investigator:
Kenneth Mah, doctoral candidate in clinical psychology

Department of Psychology, McGill University
1205 Dr. Penfield Avenue
Montreal, Quebec
H3A 1B1

McGill office number: (514) 398-6149

Supervisor:
Dr. Irving Binik, Professor of Psychology, McGill University and
Director of Sex and Couple Therapy Service, Royal Victoria Hospital

McGill office number: (514) 398-6095

GENERAL SOCIODEMOGRAPHIC INFORMATION

Please fill out as accurately as possible. Your responses will remain totally anonymous and confidential.

1) Sex (circle): MALE FEMALE

2) Age _____

3) Place of birth: please specify country _____

How long have you lived in Canada? (specify) _____

4). In what religion were you brought up? (check one)

___ Catholicism
___ Protestantism
___ Judaism
___ Islam
___ No religion
___ Other (specify) _____

5) Languages spoken (specify):

Primary (first) language _____

Second language _____

If English is **not** your first language, how would you rate your reading level of English?

(circle number best describing your reading level of English)

0	**1**	**2**	**3**	**4**	**5**
very poor					very fluent

6) What is the highest level of education you have completed? _____

7) Which best describe(s) your current employment status? (check as many as apply)

___ Working full time
___ Working part time
___ Unemployed
___ Full-time student
___ Part-time student
___ Homemaker
___ Other (specify) _____

8) What do you consider to be your primary sexual orientation? (circle):
HETEROSEXUAL HOMOSEXUAL BISEXUAL

9) Which of the following best describes your current relationship status? (circle)

a) single, not in steady relationship

b) with partner, not living together

c) cohabiting or married

d) other (briefly describe) _____

10) Please list any serious illness(es) or other serious medical problem(s) that you presently have/have had, along with the year(s) when you suffered from them (e.g., 1986-89, 1985-present)

Illness(es)	Year(s)
_____	_____
_____	_____
_____	_____

11) Please list any medication(s) you are presently taking.

_____	_____
_____	_____
_____	_____

CHECKLIST ONE

Please fill out as best as you can. Your responses will remain totally anonymous and confidential.

Please recall as clearly as possible the most recent orgasm you experienced through **solitary masturbation**. This would include any sexual situation in which you had an orgasm while alone (i.e., partner was not present).

1) About how long ago in **days** did you experience this orgasm? _____

2) About how long in **seconds** did the orgasm last? _____

Below is a list of words that might be used to describe the experience of orgasm. Different people may use different words to describe their personal experience. Beside each word, write the number that best indicates how well that word describes your most recent orgasm experienced through **solitary masturbation**.

If you have **never** had an orgasm in this way, please place an **X** on this line _____ and do not rate the words.

To rate each of the following words, use the following rating scale:

---

0 does not describe it at all — **1** **2** **3** **4** **5** **6** **7** **8** **9** describes it perfectly

*** * * PLEASE RATE ALL OF THE WORDS AS BEST AS YOU CAN * * ***

tensing	___	flowing	___	terrifying	___	engulfing	___	building	___
penetrating	___	releasing	___	tiring	___	quivering	___	pleasant	___
cutting	___	swelling	___	stopping	___	erupting	___	moderate	___
flooding	___	mystical	___	stabbing	___	cramping	___	sweeping	___
pounding	___	tickling	___	straining	___	dull	___	distressing	___
painful	___	euphoric	___	floating	___	sore	___	full	___
oozing	___	piercing	___	exquisite	___	pulling	___	warm	___
wretched	___	squeezing	___	sickening	___	tearing	___	sore	___
hot	___	unbearable	___	intoxicating	___	pressing	___	merging	___
tugging	___	sensual	___	grueling	___	flushing	___	bright	___
churning	___	burning	___	soaring	___	abandoned	___	searing	___
wild	___	peaceful	___	light-headed	___	detached	___	spreading	___
suspended	___	radiating	___	beating	___	aching	___	trembling	___
agonizing	___	shuddering	___	cool	___	elated	___	crushing	___

dizzying	___	faint	___	intense	___	relieving	___	horrible	___
ecstatic	___	punishing	___	flashing	___	sharp	___	unreal	___
suffocating	___	deep	___	alone	___	rapturous	___	uncontrolled	___
unending	___	gratifying	___	shooting	___	exhausting	___	stinging	___
melting	___	close	___	splitting	___	relaxing	___	exploding	___
boring	___	frightening	___	long	___	throbbing	___	inevitable	___
rising	___	tightening	___	wrenching	___	exciting	___	complete	___
passionate	___	drilling	___	spurting	___	unifying	___	falling	___
quick	___	heavy	___	mild	___	nauseating	___	fulfilling	___
crashing	___	pulsating	___	vicious	___	sweet	___	powerful	___
pleasurable	___	loving	___	violent	___	enjoyable	___	cold	___
incredible	___	tender	___	cathartic	___	forceful	___	exhilarating	___
unnerving	___	satisfying	___	tingling	___	hurting	___	blissful	___
excruciating	___	immersing	___	oblivious	___	discomforting	___	soothing	___
vulnerable	___	absorbed	___						

Below, please write down any other words that you think describes the experience of orgasm and which should be included in this list:

_____

_____

_____

CHECKLIST TWO

Please fill out as best as you can. Your responses will remain totally anonymous and confidential.

Recall as clearly as possible the most recent orgasm you experienced during **sex with a partner**. This would include any sexual situation in which you had an orgasm while your partner was there.

1) About how long ago in **days** did you experience this orgasm?

2) About how long in **seconds** did the orgasm last?

3) To the best of your memory, how did you have the orgasm? (circle the letter beside how you had the orgasm)

a) through intercourse (vaginal/anal/other) b) through oral stimulation from my partner

c) through manual stimulation from my partner d) through manual stimulation from myself

e) other (describe briefly) _____

Below is a list of words that might be used to describe the experience of orgasm. Different people may use different words to describe their personal experience. Beside each word, write the number that best indicates how well that word describes your most recent orgasm experienced through **sex with a partner.**

If you have **never** had an orgasm in this way, please place an **X** on this line _ and do not rate the words.

To rate each of the following words, use the following rating scale:

---

0 **1** **2** **3** **4** **5** **6** **7** **8** **9**

does not describe it at all — describes it perfectly

*** * * PLEASE RATE ALL OF THE WORDS AS BEST AS YOU CAN * * ***

tensing	___	flowing	___	terrifying	___	engulfing	___	building	___
penetrating	___	releasing	___	tiring	___	quivering	___	pleasant	___
cutting	___	swelling	___	stopping	___	erupting	___	moderate	___
flooding	___	mystical	___	stabbing	___	cramping	___	sweeping	___
pounding	___	tickling	___	straining	___	dull	___	distressing	___
painful	___	euphoric	___	floating	___	sore	___	full	___
oozing	___	piercing	___	exquisite	___	pulling	___	warm	___
wretched	___	squeezing	___	sickening	___	tearing	___	sore	___
hot	___	unbearable	___	intoxicating	___	pressing	___	merging	___
tugging	___	sensual	___	grueling	___	flushing	___	bright	___

churning	___	burning	___	soaring	___	abandoned	___	searing	___
wild	___	peaceful	___	light-headed	___	detached	___	spreading	___
suspended	___	radiating	___	beating	___	aching	___	trembling	___
agonizing	___	shuddering	___	cool	___	elated	___	crushing	___
dizzying	___	faint	___	intense	___	relieving	___	horrible	___
ecstatic	___	punishing	___	flashing	___	sharp	___	unreal	___
suffocating	___	deep	___	alone	___	rapturous	___	uncontrolled	___
unending	___	gratifying	___	shooting	___	exhausting	___	stinging	___
melting	___	close	___	splitting	___	relaxing	___	exploding	___
boring	___	frightening	___	long	___	throbbing	___	inevitable	___
rising	___	tightening	___	wrenching	___	exciting	___	complete	___
passionate	___	drilling	___	spurting	___	unifying	___	falling	___
quick	___	heavy	___	mild	___	nauseating	___	fulfilling	___
crashing	___	pulsating	___	vicious	___	sweet	___	powerful	___
pleasurable	___	loving	___	violent	___	enjoyable	___	cold	___
incredible	___	tender	___	cathartic	___	forceful	___	exhilarating	___
unnerving	___	satisfying	___	tingling	___	hurting	___	blissful	___
excruciating	___	immersing	___	oblivious	___	discomforting	___	soothing	___
vulnerable	___	absorbed	___						

Below, please write down any other words that you think describes the experience of orgasm and which should be included in this list:

_____

_____

_____

Appendix B

Materials Used for Study 1 and Study 2

--Solicitation Letter to Professors

--Check Sheet for Followup Telephone Call to Professors to Arrange Class Visit

--Followup Telephone Call to Professors, Solicitation Script

--In-Class Participant Solicitation Script

--Instruction Sheet for Pickup and Dropoff Questionnaire Boxes

--Lottery Instructions/Form

--Psychology Subject Pool, Additional Materials

(Research Report)

(Signup Sheet)

(Debriefing Form)

--Data-Collection Booth, Resources List

--Study Advertisement Posted on LISTSERVs

--Web Documents for Online Orgasm Questionnaires

Department of Psychology
McGill University
1205 Dr. Penfield Ave.
Montreal, Quebec H3A 1B1

To Whom It May Concern:

I am currently conducting research on common sexual experiences. Ultimately, the results of this project will have clinical implications in dealing with complaints involving sexual functioning. The main component of the research is the development of a questionnaire in which individuals are asked to rate a short list of adjectives on a 0-5 scale according to how well each adjective describes their experience of orgasm. At this point, a potentially useful list of adjectives has been developed but which requires further validation.

Therefore, I am writing to ask if it would be possible for my students to visit your class(es) once for only 10 minutes to briefly describe the objectives of this study and to distribute the questionnaires. Students would be asked to complete these questionnaires and then return them to my students. They will be told that participation is strictly voluntary and will not affect their grade in the course. Anonymity and confidentiality will also be assured. A lottery will be offered for those who decide to participate. Again, this process would take only about 10 minutes of your class time.

I will be following up this letter with a phone call in a few days to confirm whether you will be able to allow us to visit your class(es). At this time, if you have any further questions or concerns about this study, please do not hesitate to ask. I can also be reached through e-mail at the following e-mail addresses: **binik@ego.psych.mcgill.ca** or **kenneth@ego.psych.mcgill.ca**

I understand many will be uncomfortable with a request involving such a personal topic being so openly examined. However, I believe that the ultimate clinical benefits of this study outweigh its negative aspects. I also uphold the strictest level of discretion and respect throughout the study and expect the same from my student assistants. Let me also reemphasize that we will not be asking for names or any identifying information, and all responses received will be held in the strictest confidence. We have had no evidence that participation in this study is extremely upsetting, and those who are uncomfortable are free to decline participation; many who have completed the questionnaires in the past have found it an interesting experience to think about their sexuality in a way not previously considered.

Thank you very much for your time, and please accept my appreciation.

Sincerely,

Irv Binik, Ph.D.
Professor of Psychology, McGill University; Director of Sex and Couple Therapy Service, Royal Victoria Hospital
McGill local 6094

Date called _____ **Call back on** _____

Person who called _____

Professor _____

Department of _____

McGill local/other phone number _____

is **willing** / **not willing** (circle one) to allow us to distribute questionnaires.

Course Name _____

Building / Room number _____

Class days/time _____ **Number of students** _____

Date(s) (and **time(s)** if beginning of class is inconvenient) when we may visit the class

_____

Comments (e.g., ask for reason why will not allow us to visit classes for our records)

_____

_____

_____

Hello, prof. _____. My name is _____. I'm a research assistant in the Department of Psychology working with a graduate student, Kenneth Mah, and Dr. Irv Binik. I'm calling first of all as a follow-up to a letter of request that Dr. Binik sent you and which I hope you've received, concerning a study they're doing.

(if they haven't received/read it) Oh, then may I take just a few minutes of your time to describe the request? It's a project concerning particular sexual experiences, specifically the experience of orgasm. We are developing a questionnaire about this sexual experience that we hope will ultimately be useful in evaluating complaints of sexual problems and formulating appropriate treatments. At this point, we need to test the questionnaire out on healthy individuals to assess whether the questionnaire is indeed useful. What it involves is having individuals rate a set of adjectives on a 0-5 scale on how well each adjective describes their experience of orgasm. The project has received ethics approval and federal funding by the Social Sciences and Humanities Research Council. At this point, we're asking professors to allow us a few minutes with their students. We'd be asking your students to complete the questionnaires in your class, and this would take about 10 minutes in total. Your students would of course be told that their participation is totally voluntary and won't affect their standing in their courses, and that anonymity and confidentiality are assured. This is basically how the request read. Would you be willing to allow us this time with your students? **(go to "Answers")**

(if they've received it) Okay. I'm also calling to confirm whether you'd be able to give us permission to come into your classroom for about 10-15 minutes to ask students to fill out a short set of questionnaires?

Answers

1. (if "yes") Thank you very much, we really appreciate your cooperation. I'd just like to get some information from you then **(complete information form)**

(if date given is more than 4 days away) Okay, then, we'd like to call you again the day before just to confirm this time, if that's okay.

2. (if "no" because of time constraints) Would it be possible then to visit your class for just five minutes in order to describe the study and hand out the questionnaires? The students would then be told to complete the questionnaire on their own time and then to return it at drop-off points around campus. **(if "okay" go back to 1; if still "no" go to 3)**

3. Just for our records, may I ask why you're unable to provide permission? **(record answer)**

Thank you very much for your time, Prof. _____

--My name is Ken, and I'm a graduate student from the Department of Psychology. These are my research assistants, _____ and _____. [ADJUST IF RESEARCH ASSISTANTS SOLICITING: My name is __, and I'm a research assistant working in the Department of psychology with a graduate student, Kenneth Mah, and Dr. Irv Binik]. Your professor was kind enough allow me to speak to you about research I'm conducting and to ask for your input.

--study about the experience of orgasm, which I realize is an odd thing to study, and a lot of you probably feel uncomfortable because it's such a personal and intimate experience. Most of us never really think about it, and if you were to try now, it would probably be very difficult for you to come up with a good description of how orgasm feels. But there are many other groups of people, like those with particular diseases or disorders, who report sexual problems, like problems with orgasm, that they find very distressing. A satisfying sex life is essential to most, and so these kinds of difficulties often end up causing other problems in these people's beliefs about themselves as well as within the relationship. One of our ultimate goals is to investigate and understand these people's experiences in detail so as to be able to identify the specific underlying problem or problems. It's our hope that we will then be able to develop more effective interventions directed towards the identified problem.

--to do this, though, we need an idea of what people with generally no major health or other problems experience during orgasm. We will then be able to make useful comparisons with these other groups of people who report problems. It is then that we can identify and target specific symptoms for treatment or use these symptoms as signs of other problems that need treatment.

--to do this, we're developing a list of adjectives that people might use to describe their own experience of orgasm. We're in the process of evaluating this list to make sure that only words that really convey some aspect of the experience of orgasm will be used. To do this, we're having as many people as possible rate the adjectives according to how well each adjective describes their own experience of orgasm. This is why we're here today, to ask for your help in evaluating this list of adjectives.

(for in-class completion if allowed)
--_____ and _____ will now hand out a questionnaire package to everyone. It would be helpful if as many of you as possible would consent to fill out the enclosed questionnaires at this time. The questionnaires first ask for some general demographics information, and then you're asked to rate a short set of adjectives on a scale of 0 to 5 on how well each adjective describes your experience of orgasm. There are also some other short items asking about your perception of other aspects of your orgasm experience. The whole thing takes a short time to complete, only about 10 minutes. Your participation is totally voluntary and whether you decide to complete the questionnaires or not of course won't affect your standing in this course. Also be assured that you are not asked to put your name or any other identifying information anywhere on the questionnaires, and we assure anonymity and confidentiality of your responses. When you're done, seal your completed questionnaire in the envelope provided, and we'll pick it up.

(for students completing them on own time)
--_____ and _____ will now hand out a questionnaire package to everyone. It would be helpful if as many of you as possible would consent to fill out the enclosed questionnaires at this time. The questionnaires first ask for some general demographics information, and then you're asked to rate a short set of adjectives on a scale of 0 to 5 on how well each adjective describes your experience of orgasm. There are also some other short items asking about your perception of other aspects of your orgasm experience. The whole thing takes a short time to

complete, only about 10 minutes. Your participation is totally voluntary and whether you decide to complete the questionnaires or not of course won't affect your standing in this course. Also be assured that you are not asked to put your name or any other identifying information anywhere on the questionnaires, and we assure anonymity and confidentiality of your responses. When you're done, you can drop off your questionnaire sealed in the envelope provided at one of several drop-off boxes placed around campus. There is a list included in the package of the locations of these drop-off boxes.

For those who decide to participate, we are offering a lottery of four cash prizes of $100 each. The lottery will take place _____, and then the results will be posted across campus with instructions on how to claim your prize. You do not need to provide your name or other identifying information to be entered into the lottery. Instructions on how to enter the lottery are included in the package.

--again, we just want to tell you we do understand that many of you will feel uncomfortable about participating in this kind of research. We believe, though, that sexuality is a vital and complex issue that needs to be thoroughly understood if the many people experiencing problems with that aspect of life are to be helped. This can only be done through research, but we uphold the strictest level of discretion and respect in running this study, and we will maintain strict anonymity and confidentiality of your responses if you decide to participate.

--thank you very much for your time.

DEPARTMENT OF PSYCHOLOGY
MCGILL UNIVERSITY

Thank you very much for deciding to participate in this study. Please read the following instructions very carefully before filling out the questionnaires.

If you HAVE filled out this questionnaire before, please place a checkmark on this line ____

Filling Out the Questionnaire Packet

The enclosed questionnaires ask you to rate a set of adjectives on a scale of 0 to 5 according to how well each adjective describes your **most recent** orgasm experience. If you have **never** had an orgasm or are unsure about whether you have experienced orgasm through either one or both of these ways, then indicate this with an **X** on the line provided and rate the adjectives according to **how you think** orgasm might feel. Before filling out each section of the questionnaire, **please read all instructions very carefully.**

Entering the Lottery

The final page of the questionnaire package is the entry form that you must fill out to enter the lottery for four cash prizes of **$100** each. To do so, make up a personal code, using whatever letter-number-symbol combination you wish. Write this personal code **in both of the boxes**, making sure that the code is written **in exactly the same way in both boxes**. Then tear off the bottom half of the sheet and **keep this portion safely with you**. The top half must be returned with your questionnaires. If your code is one of the ones announced as winners, then you must present the bottom half to claim your prize, so again, **keep the bottom half safely with you**. Winning codes will be posted on _____ around the McGill campus.

Returning the Questionnaire Package

Please return your completed questionnaire package sealed in the envelope provided. If you are completing this questionnaire outside of classtime, drop off the envelope at the drop-off box marked "**K.M. Study**" at one of the following locations around campus:

--Information Center at the Union Center (Shatner Building), 1st floor.
--room N7/13 or W8/36, Stewart Biology Building

Thank you again for your participation.

****

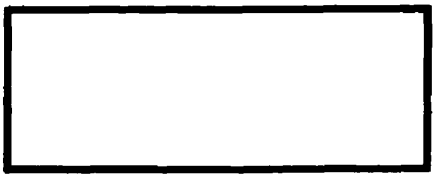
Investigator: Kenneth Mah, Ph.D. Candidate in Clinical Psychology 398-6149
Supervisor: Dr. Irv Binik, Professor of Psychology 398-6095

****

STUDY: THE EXPERIENCE OF ORGASM

For those who choose to participate in this study, we are holding a lottery with three prizes: **$200**, **$100**, and **$50**. Below are two boxed codes, one above and one below the dotted line. Once you have filled out the surveys, rip along the dotted line and **keep the bottom half.** Once we have received all of the surveys, we will then post the winning codes across campus, along with information as to where you may collect your prize. If you are a winner, you must present the bottom half of this sheet with your code in order to claim your prize, so again, **keep your code safe and do not tamper with it.**

(rip along dotted line; keep the **bottom** code safe to claim your prize)



To claim a lottery prize, follow the instructions to be posted around April 15. Again, **have your code with you** when you claim a prize.

Do not tamper with or change the code, otherwise it will be considered invalid, and you will not receive your prize.

Undergraduate Psychology Subject Pool Request: Research Report

Name of experimenter: Kenneth Mah
Name of experiment: The psychological experience of orgasm

I. Hypothesis

a) In both males and females, the psychological experience of orgasm will similarly comprise three distinct components or dimensions: the **sensory**, **cognitive**, and **affective**. These components will be reflected by patterns of ratings of adjectives differentially associated a priori with the different components. How these three components covary will depend on the sexual context: **noninterpersonal** (solitary masturbation) vs. **interpersonal** (sex with a partner).

b) This is a correlational study: adjectives potentially descriptive of the orgasm experience would be rated to describe the orgasm experience attained through solitary masturbation vs. sex with a partner.

II. Variables

a) **Variable #1: interpersonal sexual contexts** in which orgasm occurred (noninterpersonal [solitary masturbation] vs. interpersonal [sex with a partner]).
Variable #2: pattern of adjective ratings which reflects the pattern of sensory, cognitive, and affective components of orgasm.

b) **Prediction:** Orgasm attained within the noninterpersonal context of solitary masturbation will be reflected more by sensory and cognitive components, (i.e., more adjectives associated with the sensory and cognitive dimension will be rated more highly), whereas orgasm attained within the interpersonal context of sex with a partner will be reflected more by higher affective adjective ratings.

III. Control

a) **Confounding variable:** the contextual variables, as stated, are not truly comparable, in that solitary masturbation not only indicates the absence of a partner, but also a specific behavior. The definition of sex with a partner, on the other hand, is ambiguous in terms of defining the sexual behavior that led to the orgasm.

b) The orgasm experience rated by a particular subject within the interpersonal context may have been attained through self-masturbation with partner present, vs. partner masturbation (oral or manual), vaginal or anal intercourse, etc. The presence of the partner may therefore be just one of many factors impacting on the orgasm experience.

c) With the interpersonal context, potential behaviors through which orgasm may be attained, such as self-masturbation with partner present, partner masturbation, oral vs. manual stimulation, and vaginal vs. anal intercourse, will be specified. When rating the orgasm experience within the interpersonal context, then, subjects will indicate the specific behavior which resulted in the orgasm.

IV. Subjects

a) Subjects were students from the McGill Psychology subject pool (students in a first-level cognition course) and those from other undergraduate and Continuing Education courses who agreed to participate by filling out an adjective-checklist package given.

b) Subjects were not assigned to groups but were asked to fill out the adjective-checklist package for both solitary masturbation and sex with a partner. If they had not had experience in either or both sexual contexts, subjects were asked not to fill out the associated checklist(s).

UNDERGRADUATE SUBJECT POOL STUDY:
THE PSYCHOLOGICAL EXPERIENCE OF ORGASM

-- We are looking for male and female undergraduate students who are fluent in English and who have had previous and recent sexual experiences that included orgasm and who are fluent in English.

-- Participants will be asked to complete checklists in which they rate adjectives on how well each adjective describes their orgasm experience. They would be asked to complete two such checklists (one to describe orgasm attained through masturbation, and one to describe orgasm attained through sex with a partner), as well as a brief socio-demographics questionnaire.

-- It will take approximately 15 minutes to complete the checklists and questionnaire. Your responses will remain anonymous and confidential, you will not be asked to give your name or any kind of definite identifying information, and you will also not be required to sign a consent form. Instead, consent will be indicated by your voluntarily completing the checklists.

Investigator: Kenneth Mah
McGill Phone Number 398-6149

UNDERGRADUATE SUBJECT POOL STUDY: THE PSYCHOLOGICAL EXPERIENCE OF ORGASM

DEBRIEFING

This study was intended to investigate the psychological experience of orgasm. We have developed a model of the psychological experience of orgasm that consists of three components or dimensions:

-- the **sensory component**, which involves the orgasm sensations that appear more or less associated with physiological events that occur during orgasm, such as seminal emission and ejaculation;
-- the **cognitive component**, which involves evaluations of the general orgasm experience, i.e., how the orgasm felt; and
-- the **affective component**, which involves feelings or emotions experienced during orgasm, i.e., how "I" felt during orgasm.

In order to examine this model of the orgasm experience, we collected a number of adjectives that may be potentially descriptive of the orgasm experience. Each adjective was then associated on an a priori basis with one of the components. For example,

-- **tensing**, **shooting**, and **throbbing** were considered to reflect the sensory component of orgasm;
-- **powerful**, **satisfying**, and **exhausting** were considered to reflect the cognitive component; and
-- **ecstatic**, **light-headed**, and **rapturous** were considered to reflect the affective component.

We then created the Orgasm Questionnaire, in which subjects rate each adjective on a scale of 0-5 according to how well that adjective describes their most recent orgasm experience, attained within the interpersonal vs. noninterpersonal context.

We will expect that, in analyzing the responses received, the adjectives will be associated with each other so as to indicate the validity of our three-component model of the psychological experience of orgasm. We thus expect that those adjectives that we grouped together on an a priori, intuitive basis to reflect the sensory component, for example, will indeed associate in that way upon data analysis, whereas other adjectives will also group separately to form the cognitive and affective components. This would then suggest that these three components do distinctly make up the psychological experience of orgasm.

We also hypothesize that the pattern of interrelations among the three orgasm components will be different when orgasm has been attained through a noninterpersonal context (solitary masturbation) vs. an interpersonal context (sex with a partner). We expect that sensory and cognitive components will be more prevalent in orgasm attained through the noninterpersonal context, whereas affective components will be more prevalent in orgasm attained through the interpersonal context.

Please be assured that anonymity and confidentiality of your responses will be preserved. Your responses will be identified only by a code and will be read only by the investigator. Any results will be presented only as responses averaged across subjects. Also note that a wide range of responses is possible (there is no "right answer"), and we expect that different individuals will give different responses that reflect his or her own subjective experience of orgasm.

Thank you very much for participating in this study.

Kenneth Mah, doctoral candidate in clinical psychology
McGill Office phone number: 398-6149

Supervisor: Dr. Irv Binik

RESOURCES FOR SEXUAL INFORMATION

On Campus

General Counselling Services	398-6019
Lesbians, Bisexuals, Gays and Transgendered Students of McGill	398-6822
McGill Legal Information/Legal Action Against Sexual Assault	398-6894
McGill Nightline (18:00-3:00)	398-6246
McGill WalkSafe Network	398-2498
McGill's Women Union	398-6823
Sexual Assault Centre	398-2700
Sexual Harassment	398-1382 (Prof. Robert Lecker) 398-8334 (Ms. Judy Stymest) 398-4508 (Prof. Pat Wells)
Student Health	398-6017

Off Campus

Abortion Services	Royal Victoria Hospital	842-1637
	Montreal General Hospital	934-8076
	Jewish General Hospital	340-8271
	CLSC Centre Ville	847-1250
	CLSC Centre-Sud	527-2361
	Champlain Clinic Dr. Morgentaler	351-2522
	Clinique Medicale Femina	843-7904
	Clinique Medicale de l'Alternative	281-9848
	Centre de Santé des Femmes	842-8096
AIDS Community Care of Montreal	287-3551	
AIDS Hotline (ACCM)	939-0075	
AIDS Intervention Centre/Info-Line (anonymous testing, prevention, education, and support services)	934-0552	
Centre de Santé des Femmes de Montréal	842-8903	

CLSC locations	931-1448
Dans La Rue	984-4247
Fédération du Québec pour le planning des naissances (research/referral center for women's health, sexuality, contraception, and reproductive rights)	844-3721
Gay and Lesbian Community Centre of Montreal	528-8424
Info-Santé (non-emergency medical advice/ referral service)	275-7575
Le Spectre (support group for transgender, transsexual, and transvestite individuals)	528-9803
Montreal Sexual Assault Centre	24-hr line 934-4504 legal aid 842-2233
National Abortion Federation	(800) 424-2280
Planned Parenthood Montreal	935-1004
Royal Victoria Hospital Sex and Couple Therapy Service	842-1231 ext. 4285
Sero-Zero	521-7778
Stella (support/resource centre for sex workers)	285-8889

Advertisement Posted on LISTSERV Discussion Groups

Hello:

I am a graduate student in Clinical Psychology at McGill University. I am examining the psychology of common sexual expriences using interactive questionnaires posted on the World Wide Web. Right now, I am looking for both men and women who are students to fill out these questionnaires. Participants can complete these questionnaires and return their responses to me conveniently while online. Anonymity and confidentiality of your responses are assured. if you are interested in participating, the questionnaires are located at the following URL:

(insert final WWW http address)

Your participation is most appreciated. Thank you very much for your time.

Sincerely,

Kenneth Mah, doctoral candidate in Clinical Psychology

Department of Psychology, McGill University

1205 Dr. Penfield Ave.

Montreal, Quebec

Canada H3A 1B1

Welcome to the Interactive Questionnaire Study of the Orgasm Experience

INTRODUCTION

● I am a Ph.D. student in Clinical Psychology at McGill University. My research interests are in the area of human sexuality, and for my thesis, I am looking at the psychology experience of orgasm. My objectives for the study include looking at both theoretical and clinical aspects. With respect to the theoretical objectives, I am attempting to outline the kinds of psychological experiences that make "orgasm" an "orgasm". My clinical objectives are outlined in a later information section.

● A lot of mystery surrounds the experience of human orgasm, despite research and other efforts to understand it. Part of the fault lies in the fact that there is currently no standard way to look at the psychological experience of orgasm in detail. People also find it quite difficult to put their sexual experiences, like orgasm, into words. I am attempting to identify words that may be useful the development of a vocabulary for describing the orgasm experience.

● Currently, I am examining orgasm in relatively healthy men and women in order to get an idea of what the "typical" experience is like, if indeed we can define a "typical" orgasm experience. To do this, I am developing an **Orgasm Checklist**, consisting of a fairly short list of adjectives that might be useful in conveying one's experience of orgasm. Participants are merely asked to rate the adjectives on a scale of 0-5 according to how well each one describes their experience of orgasm.

● If you would be interested in participating in this study, and you fit the following:

- ● you are 18 years of age or over (no upper age limit);
- ● you are a student;
- ● and you have had sexual experiences that have resulted in orgasm

then CLICK HERE to continue on to the information and checklists as they have been presented so far to student research participants at McGill University

Keywords: orgasm, research, studies, psychology, sexuality, sexual functioning, subjects, participation, ratings, scales

● **conducted by Kenneth Mah, doctoral candidate in McGill's Clinical Psychology program, as part of a Ph.D. dissertation.**

● **supervised by Dr. Irv Binik, Professor of Psychology, McGill University.**

● *Questions? Comments?*
Contact me at my e-mail address:
kenneth@ego.psych.mcgill.ca

Welcome to the Interactive Questionnaire Study of the Orgasm Experience

● **Thank you very much for deciding to participate in this study.**

● **Please read all following information and instructions *very carefully* before filling out the questionnaires.**

STUDY: THE EXPERIENCE OF ORGASM

● Orgasm is a very personal event that most of us take for granted. However, there are others, such as diabetics, patients with multiple sclerosis, and the spinal-injured, who unfortunately experience difficulties with orgasm. I would like to collect information about the experience of orgasm in relatively healthy individuals, in order to understand first the typical orgasm experience in men and women. I would then like to compare this with the experience in those who have medical problems that can affect sexuality. To do this, I am developing a vocabulary which people can use to describe their experience of orgasm. The following include three short interactive-form questionnaires that I ask you to complete as best as you can online and then to return to me.

● Note that your participation is totally voluntary. You can refuse to answer any of the questions asked. Your responses will remain anonymous and confidential; you are **NOT** asked to give your name or any other identifying information. To ensure further anonymity, no consent form is included for you to sign. Instead, your consent will be indicated by your voluntarily filling out the questionnaires and returning them online to me.

● If you have any further questions or concerns regarding the questionnaires or this study, please do not hesitate to contact me.

Thank you very much for your time.

CLICK HERE TO PROCEED TO QUESTIONNAIRES

● **conducted by Kenneth Mah, doctoral candidate in McGill's Clinical Psychology program, as part of a Ph.D. dissertation.**

● **supervised by Dr. Irv Binik, Professor of Psychology, McGill University.**

● *Questions? Comments?*

Contact me at my e-mail address:
kenneth@ego.psych.mcgill.ca

Welcome to the Interactive Questionnaire Study of the Orgasm Experience

- **Thank you very much for deciding to participate in this study.**
- **Please read all following information and instructions *very carefully* before filling out the questionnaires.**

COMPLETING THIS QUESTIONNAIRE ONLINE

- Please read each question carefully and enter your response as requested. Move to the next question by using your mouse to place the cursor at the beginning of each response area or by using the TAB key. Once you have completed the questionnaire, click on **SUBMIT** at the end of the questionnaire. Your responses will then be automatically submitted to the investigator's mailbox without any personal identification.
- **I again thank you very much for your participation; it is very much appreciated.**

THE ORGASM CHECKLIST

GENERAL INFORMATION

- **PLEASE FILL OUT AS ACCURATELY AS POSSIBLE.**
- **YOUR RESPONSES WILL REMAIN ANONYMOUS AND CONFIDENTIAL.**

If you HAVE ever filled out this questionnaire before, please check here ☐ ; if you HAVE NEVER completed this questionnaire before, leave the box BLANK.

1. Sex (check one)

   Male ☐

Female ☐

2. Age ☐

3. Country You Live In ☐

4. In what religion were you brought up (check one)?

Catholicism ☐ Protestantism ☐ Judaism ☐ Islam ☐

No religion ☐

Other (specify briefly) ☐

5. If English is **NOT** your first language, how would you rate your reading level of English? Using the scale below, indicate in the box provided the number best describing your reading level of English (leave blank if you are a native speaker of English)

☐

0 = very poor
1
2
3
4
5 = very fluent

6. What is the highest level of education you have completed?

☐

7. What do you consider to be your primary sexual orientation (check one)?

Heterosexual ☐

Homosexual ☐

Bisexual ☐

8. Which of the following best describes your current relationship status (check one)?

Single, not in steady relationship ☐

With partner, not living together ☐

Cohabiting or married/bonded ☐

Other (briefly describe)

☐

9. Please list any serious illness(es) or other serious medical problem(s) that you presently have

☐

10. Please list any medication(s) you are presently taking

Now please complete the next two questionnaires as best as you can.

CHECKLIST ONE

• PLEASE FILL OUT AS ACCURATELY AS POSSIBLE.
• YOUR RESPONSES WILL REMAIN ANONYMOUS AND CONFIDENTIAL.

Recall as clearly as possible the most recent orgasm you experienced through **SOLITARY MASTURBATION**. This would include any sexual situation in which you had an orgasm while alone (i.e., partner was not present).

1. About how long ago in **DAYS** did you experience this orgasm? ☐

2. About how long in **SECONDS** did the orgasm last? ☐

Below is a list of words that might be used to describe the experience of orgasm. Different people may use different words to describe their personal experience. Beside each word, indicate the number that best says how well that word describes your most recent orgasm experienced through **SOLITARY MASTURBATION**.

If you have **NEVER** had an orgasm in this way, please check this box ☐ and rate the words according to how you **THINK** an orgasm experienced through **SOLITARY MASTURBATION** might feel. To rate each of the following words, use the following rating scale:

0 = does not describe it at all
1
2
3
4
5 = describes it perfectly

*** • *PLEASE RATE ALL OF THE WORDS AS BEST AS YOU CAN* * ***

tensing ☐	flowing ☐	engulfing ☐	building ☐
penetrating ☐	releasing ☐	quivering ☐	swelling ☐
erupting ☐	long ☐	deep ☐	euphoric ☐
shuddering ☐	pleasurable ☐	sensual ☐	flushing ☐
pulsating ☐	peaceful ☐	inevitable ☐	spreading ☐
radiating ☐	alone ☐	elated ☐	intense ☐
relieving ☐	ecstatic ☐	satisfying ☐	shooting ☐
flooding ☐	uncontrolled ☐	painful ☐	hot ☐
relaxing ☐	immersing ☐	tender ☐	light-headed ☐
unifying ☐	quick ☐	incredible ☐	rising ☐
passionate ☐	exciting ☐	exhausting ☐	exploding ☐
soothing ☐	throbbing ☐	powerful ☐	trembling ☐
complete ☐	warm ☐	blissful ☐	loving ☐
spurting ☐	absorbed ☐	tingling ☐	wild ☐
close ☐	unreal ☐	rapturous ☐	fulfilling ☐

Below, please write down any other words that you think describe the experience of orgasm and which should be included in this list

CHECKLIST TWO

- **PLEASE FILL OUT AS ACCURATELY AS POSSIBLE.**
- **YOUR RESPONSES WILL REMAIN ANONYMOUS AND CONFIDENTIAL.**

Recall as clearly as possible the most recent orgasm you experienced through **SEX WITH A PARTNER.** This would include any sexual situation in which you had an orgasm while your partner was there.

1. About how long ago in **DAYS** did you experience this orgasm? ☐

2. About how long in **SECONDS** did the orgasm last? ☐

3. To the best of your memory, how did you have this orgasm (check)?

through intercourse (vaginal/anal/other) ☐

through oral stimulation from my partner ☐

through manual stimulation from my partner ☐

through manual stimulation from myself ☐

other (briefly describe)

☐

☐

Below is a list of words that might be used to describe the experience of orgasm. Different people may use different words to describe their personal experience. Beside each word, indicate the number that best says how well that word describes your most recent orgasm experienced through **SEX WITH A PARTNER.**

If you have **NEVER** had an orgasm in this way, please check this box ☐ and rate the words according to how you **THINK** an orgasm experienced through **SEX WITH A PARTNER** might feel. To rate each of the following words, use the following rating scale:

0 = does not describe it at all
1
2
3
4
5 = describes it perfectly

*** * *PLEASE RATE ALL OF THE WORDS AS BEST AS YOU CAN* * ***

---

tensing ☐	flowing ☐	engulfing ☐	building ☐
penetrating ☐	releasing ☐	quivering ☐	swelling ☐
erupting ☐	long ☐	deep ☐	euphoric ☐
shuddering ☐	pleasurable ☐	sensual ☐	flushing ☐
pulsating ☐	peaceful ☐	inevitable ☐	spreading ☐
radiating ☐	alone ☐	elated ☐	intense ☐
relieving ☐	ecstatic ☐	satisfying ☐	shooting ☐
flooding ☐	uncontrolled ☐	painful ☐	hot ☐
relaxing ☐	immersing ☐	tender ☐	light-headed ☐
unifying ☐	quick ☐	incredible ☐	rising ☐
passionate ☐	exciting ☐	exhausting ☐	exploding ☐
soothing ☐	throbbing ☐	powerful ☐	trembling ☐
complete ☐	warm ☐	blissful ☐	loving ☐
spurting ☐	absorbed ☐	tingling ☐	wild ☐
close ☐	unreal ☐	rapturous ☐	fulfilling ☐

Below, please write down any other words that you think describe the experience of orgasm and which should be included in this list

● You have now completed this checklist package.
Submit the questionnaires to the investigator by clicking on **SUBMIT**.
Your responses will be automatically submitted to the investigator's mailbox at the following address:

Kenneth Mah

Department of Psychology
McGill University
1205 Dr. Penfield Ave.
Montreal, Quebec
Canada H3A 1B1
(e-mail: kenneth@ego.psych.mcgill.ca)

SUBMIT

Reset

- **Thank you once again for your interest in this study; your participation is *greatly appreciated!!!***

- **NOTE**

We anticipate that initial results for this study will be available **(around May 1996)**.

At that time, they will be made available in a **Results** page that will be added onto this homepage.

Look for this page around that time if you're interested!!!

- **conducted by Kenneth Mah, doctoral candidate in McGill's Clinical Psychology program, as part of a Ph.D. dissertation.**

- **supervised by Dr. Irv Binik, Professor of Psychology, McGill University.**

- *Questions? Comments?*

Contact me at my e-mail address:
kenneth@ego.psych.mcgill.ca

Appendix C

Full McGill-Mah Orgasm Questionnaire, Study 1

--Cover Letter

--General Information

--Checklist One, Checklist Two

STUDY: THE EXPERIENCE OF ORGASM

Orgasm is a very personal event that most of us take for granted. However, there are others, such as diabetics, patients with multiple sclerosis, and the spinal-injured, who unfortunately experience difficulties with orgasm. We would like to collect information about the experience of orgasm in relatively healthy individuals, in order to understand first the "typical" orgasm experience in men and women. We would then like to compare this with the experience in those who have medical problems that affect sexuality. Enclosed are three short questionnaires that we ask you to complete as best you can and then to return in the envelope provided. **Even if you choose not to fill them out, we would appreciate it if you would still return the blank questionnaires in the envelope so that they can be recycled.**

Your participation is totally voluntary and will not affect your standing in your course. You can refuse to answer any of the questions asked. Your responses will remain anonymous and , as you are not asked to give your name or any other identifying information. To ensure provide complete anonymity, no consent form is included for you to sign. Instead, your consent will be indicated by your voluntarily filling out the questionnaires and returning them in the envelope provided.

Should you have any further questions or concerns regarding the questionnaires or this study, please do not hesitate to contact the primary investigator. Thank you very much for your time.

Primary Investigator:
Kenneth Mah, doctoral candidate in clinical psychology

Department of Psychology, McGill University
1205 Dr. Penfield Avenue
Montreal, Quebec
H3A 1B1

McGill office number: (514) 398-6149

Supervisor:
Dr. Irving Binik, Professor of Psychology, McGill University and
Director of Sex and Couple Therapy Service, Royal Victoria Hospital

McGill office number: (514) 398-6095

GENERAL INFORMATION

Please fill out as accurately as possible. Your responses will remain totally anonymous and confidential.

1) Sex (circle): MALE FEMALE

2) Age _____

3. In what religion were you brought up? (check one)

___ Catholicism ___ Islam

___ Protestantism ___ Other (specify) _____

___ Judaism ___ No religion

4) If English is **not** your first language, how would you rate your reading level of English?

(circle number best describing your reading level of English)

0	**1**	**2**	**3**	**4**	**5**
very poor					very fluent

5) What is the highest level of education you have completed? _____

6) What do you consider to be your primary sexual orientation? (circle):
HETEROSEXUAL HOMOSEXUAL BISEXUAL

7) Which of the following best describes your current relationship status? (circle)

a) single, not in steady relationship

b) with partner, not living together

c) cohabiting or married

d) other (briefly describe)_____

8) Please list any serious illness(es) or other serious medical problem(s) that you presently have.

Illness(es)

_____

_____

_____

9) Please list any medication(s) you are presently taking.

_____ _____

_____ _____

_____ _____

Now please complete the next two questionnaires as best as you can.

CHECKLIST ONE

Please fill out as best as you can. Your responses will remain totally anonymous and confidential.

Recall as clearly as possible the most recent orgasm you experienced through **solitary masturbation**. This would include any sexual situation in which you had an orgasm while alone (i.e., partner was not present).

1) About how long ago in **days** did you experience this orgasm? _____

2) About how long in **seconds** did the orgasm last? _____

Below is a list of words that might be used to describe the experience of orgasm. Different people may use different words to describe their personal experience. Beside each word, write the number that best indicates how well that word describes your most recent orgasm experienced through **solitary masturbation**.

If you have **never** had an orgasm in this way, please place an **X** on this line _____ and rate the words according to how you **think** an orgasm experienced through **solitary masturbation** might feel. To rate each of the following words, use the following rating scale:

0	**1**	**2**	**3**	**4**	**5**
does not describe it at all					describes it perfectly

*** * * PLEASE RATE ALL OF THE WORDS AS BEST AS YOU CAN * * ***

tensing	____	flowing	____	engulfing	____	building	____
penetrating	____	releasing	____	quivering	____	swelling	____
erupting	____	long	____	deep	____	euphoric	____
shuddering	____	pleasurable	____	sensual	____	flushing	____
pulsating	____	peaceful	____	inevitable	____	spreading	____
radiating	____	alone	____	elated	____	intense	____
relieving	____	ecstatic	____	satisfying	____	shooting	____
flooding	____	uncontrolled	____	painful	____	hot	____
relaxing	____	immersing	____	tender	____	light-headed	____
unifying	____	quick	____	incredible	____	rising	____
passionate	____	exciting	____	exhausting	____	exploding	____
soothing	____	throbbing	____	powerful	____	trembling	____
complete	____	warm	____	blissful	____	loving	____
spurting	____	absorbed	____	tingling	____	wild	____
close	____	unreal	____	rapturous	____	fulfilling	____

CHECKLIST TWO

Please fill out as best as you can. Your responses will remain totally anonymous and confidential.

Recall as clearly as possible the most recent orgasm you experienced during **sex with a partner**. This would include any sexual situation in which you had an orgasm while your partner was there.

1) About how long ago in **days** did you experience this orgasm? _____

2) About how long in **seconds** did the orgasm last? _____

3) To the best of your memory, how did you have the orgasm? (circle the letter beside how you had the orgasm)

a) through intercourse (vaginal/anal/other) b) through oral stimulation from my partner

c) through manual stimulation from my partner d) through manual stimulation from myself

e) other (describe briefly) _____

Below is a list of words that might be used to describe the experience of orgasm. Different people may use different words to describe their personal experience. Beside each word, write the number that best indicates how well that word describes your most recent orgasm experienced through **sex with a partner.**

If you have **never** had an orgasm in this way, please place an **X** on this line _____ and rate the words according to how you **think** an orgasm experienced through **sex with a partner** might feel. To rate each of the following words, use the following rating scale:

0	**1**	**2**	**3**	**4**	**5**
does not describe it at all					describes it perfectly

*** * * PLEASE RATE ALL OF THE WORDS AS BEST AS YOU CAN * * ***

tensing	____	flowing	____	engulfing	____	building	____
penetrating	____	releasing	____	quivering	____	swelling	____
erupting	____	long	____	deep	____	euphoric	____
shuddering	____	pleasurable	____	sensual	____	flushing	____
pulsating	____	peaceful	____	inevitable	____	spreading	____
radiating	____	alone	____	elated	____	intense	____
relieving	____	ecstatic	____	satisfying	____	shooting	____
flooding	____	uncontrolled	____	painful	____	hot	____
relaxing	____	immersing	____	tender	____	light-headed	____
unifying	____	quick	____	incredible	____	rising	____
passionate	____	exciting	____	exhausting	____	exploding	____

soothing	____	throbbing	____	powerful	____	trembling	____
complete	____	warm	____	blissful	____	loving	____
spurting	____	absorbed	____	tingling	____	wild	____
close	____	unreal	____	rapturous	____	fulfilling	____

Below, please write down any other words that you think describes the experience of orgasm and which should be included in this list:

_____

Appendix D

Full McGill-Mah Orgasm Questionnaire, Study 2

--Cover Letter

--General Information

--Checklist One, Checklist Two

Communicating the Experience of Orgasm

The experience of orgasm is usually very intimate and pleasurable However, there are some, such as patients with diabetes, multiple sclerosis, or spinal injury, who report difficulties with orgasm that they find disruptive to sexual enjoyment. Unfortunately, the available information on human orgasm, including an adequate way of evaluating people's experiences, is not adequate enough to aid in developing appropriate treatment plans for these individuals.

The purpose of this study is to increase our understanding of the nature of human orgasm. We are initially collecting information in relatively healthy individuals, so that we can understand the experience of orgasm in healthy people. We will then eventually compare their responses to those given by individuals who have sexual difficulties. To do this, we are evaluating a vocabulary (a set of adjectives) which people can use to describe their experience of orgasm and which will allow us to make these comparisons. Enclosed is a set of short questionnaires which we ask you to fill out. The questionnaires will take only 5-10 minutes to complete. After you have completed them, please seal and return them in the envelope provided.

Note that your participation is totally voluntary (and will not affect your standing in your course). You can refuse to answer any of the questions asked, and you may withdraw from participation at any time. Your responses will remain totally anonymous and confidential, as you are not asked to give your name or any other kind of identifying information.

Should you have any further questions or concerns regarding the questionnaires or this study, please do not hesitate to contact the primary investigator. Thank you very much for your time.

Primary Investigator:

Kenneth Mah, Doctoral Candidate in Clinical Psychology
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Montreal, Quebec
H3A 1B1
(514) 398-6090

Supervising Professor:

Dr. Irving Binik, Professor of Psychology
Department of Psychology, McGill University
Director of Sex and Couple Therapy Service, Royal Victoria Hospital
(514) 398-6095

General Information

Please fill out as accurately as possible. Your responses will remain anonymous and confidential.

1. Sex (circle) MALE FEMALE 2. Age _____ 3. Country _____

4. In what religion were you brought up? (check one)

__ Catholicism __ Protestantism __ Judaism __ Islam
__ Other (specify) _____ __ No religion

5. If English is **not** your first language, please rate your reading level of English (circle number)

0	1	2	3	4	5
very poor					very fluent

6 a. What is the highest level of education you have **completed**? (below, write "C" on line beside highest level of education **completed**)
b. What level of education are you in **now**? (below, write "N" one line beside level of education you are in **now**)

__ less than primary (grade) school
__ primary school
__ high school
__ college/Cegep/trade school
__ undergraduate degree
__ postgraduate/professional training

7. Primary sexual orientation (circle) HETEROSEXUAL HOMOSEXUAL BISEXUAL

8. Which best describes your current relationship status? (check one)

__ single, not in steady relationship
__ with partner, not living together
__ living together/married
__ other (describe briefly on line below)

_____

9. If you checked off "**single, not in steady relationship**" in the question above, please go to question 10. If you are currently in a relationship: for the next three questions, write down the number that best describes your answer on the line after each question. Please use numbers from the following scale to indicate your rating:

0	1	2	3	4	5
very low/ very little					very high/ very much

a. How would you rate your **happiness** with your current relationship? ___
b. How would you rate your **satisfaction** with your current relationship? ___
c. How would you rate how **emotionally close** you are to your current partner (i.e., **how much do you love your current partner**?) ___

10. Please list any serious illness(es) or other serious medical condition(s) you **presently** have.

_____ _____
_____ _____

11. Please list any medication(s) you are **presently** taking.

_____ _____
_____ _____

Communicating Your Experience of Orgasm

Recall to the best of your ability the most recent orgasm you experienced during **solitary masturbation**. This would include any sexual activity in which you engaged while alone.

1. About how long ago in **days** did you experience this orgasm? _____
2. Estimate how long in **seconds** this orgasm lasted _____

3. Below is a list of words that might be used to describe the experience of orgasm. Different people may use different words to describe their personal experience, and so there is no "right" answer. After each word, write the number that best indicates how well that word describes your most recent orgasm experienced through **sex with a partner**. If you have never had an orgasm in this way, please place an X on this line _____ and rate the words according to how you **think** orgasm experienced through **sex with a partner** would feel.

To rate each of the words below, use the following scale of 0 to 5. **Please rate all of the words; do not skip any.**

0 does not describe it at all	1	2	3	4	5 describes it perfectly

absorbed	___	blissful	___	building	___	close	___	ecstatic	___
elated	___	engulfing	___	euphoric	___	exciting	___	exploding	___
flooding	___	flowing	___	flushing	___	fulfilling	___	hot	___
immersing	___	loving	___	passionate	___	peaceful	___	pleasurable	___
pulsating	___	quivering	___	rapturous	___	relaxing	___	rising	___
satisfying	___	shooting	___	shuddering	___	soothing	___	spreading	___
spurting	___	swelling	___	tender	___	throbbing	___	trembling	___
uncontrolled	___	unifying	___	unreal	___	warm	___	wild	___

4. About how **long** did this orgasm seem to last? (circle)

0 very short	1	2	3	4	5 very long

5. For the next two questions, write down on the line provided the number that you feel best describes how intense this orgasm was. Please use the following scale:

0 very weak	1	2	3	4	5 very strong

a. During this orgasm, you may have experienced physical sensations throughout your body (e.g., spasms, throbbing, tension). How intense were these physical sensations overall? ____

b. During or after orgasm, you may have experienced other feelings that were more psychological rather than physical (e.g., satisfaction, feelings of peacefulness or relaxation, ecstasy, love). How intense were these nonphysical feelings overall? ____

6. Please indicate below the parts of your body in which you experienced this orgasm by placing an **X** on the line beside the body part that apply. Indicate as many of the body parts as you feel will accurately describe this orgasm. Different people will experience orgasm in many different ways, and so there is no "right" answer. We are only interested in how you experienced this orgasm.

(For women only)

I felt my orgasm in my

___ clitoris
___ vulva (outer genitals)
___ vagina (but near the surface or outer part of it)
___ vagina (deeper inside)
___ uterus
___ whole pelvic area

(For men only)

I felt my orgasm in my

___ penis
___ testes
___ deeper inside, behind my penis/testes
___ whole pelvic area

(For both men and women)

My orgasm feelings

___ centered around my outer genitals (around my clitoris/vulva/ outer vagina, penis/testes) only
___ started in my outer genitals but then spread deeper
___ centered deep inside (my inner vagina/uterus, behind my penis/ testes) only
___ centered in my whole pelvic area only
___ spread to my whole pelvic area
___ centered in other parts of my body (e.g., legs, abdomen) only
___ spread to other parts of my body
___ centered in my whole body
___ spread to my whole body

You have now completed this questionnaire package. Please seal the questionnaire package in the envelope provided and return it according to the instructions on the Information Sheet. Thank you very much for your participation. It is greatly appreciated.

Communicating Your Experience of Orgasm

Recall to the best of your ability the most recent orgasm you experienced during **sex with a partner**. This would include any sexual activity in which you had orgasm while your partner was there.

1. About how long ago in **days** did you experience this orgasm? _____
2. Estimate how long in **seconds** this orgasm lasted _____
3. To the best of your memory, how did you have this orgasm? (circle letter)

   a. through **intercourse** (vaginal/anal/other)
   b. through **oral stimulation from partner**
   c. through **manual stimulation from partner**
   d. through **manual stimulation from myself**
   e. **other** (describe briefly on line below, e.g., clitoral stimulation/vaginal intercourse at same time)

_____

4. Below is a list of words that might be used to describe the experience of orgasm. Different people may use different words to describe their personal experience, and so there is no "right" answer. After each word, write the number that best indicates how well that word describes your most recent orgasm experienced through **sex with a partner**. If you have never had an orgasm in this way, please place an X on this line _____ and rate the words according to how you **think** orgasm experienced through **sex with a partner** would feel.

To rate each of the words below, use the following scale of 0 to 5. **Please rate all of the words; do not skip any.**

0 does not describe it at all — **1** — **2** — **3** — **4** — **5** describes it perfectly

absorbed	___	blissful	___	building	___	close	___	ecstatic	___
elated	___	engulfing	___	euphoric	___	exciting	___	exploding	___
flooding	___	flowing	___	flushing	___	fulfilling	___	hot	___
immersing	___	loving	___	passionate	___	peaceful	___	pleasurable	___
pulsating	___	quivering	___	rapturous	___	relaxing	___	rising	___
satisfying	___	shooting	___	shuddering	___	soothing	___	spreading	___
spurting	___	swelling	___	tender	___	throbbing	___	trembling	___
uncontrolled	___	unifying	___	unreal	___	warm	___	wild	___

5. About how **long** did this orgasm seem to last? (circle)

0 very short — **1** — **2** — **3** — **4** — **5** very long

6. For the next two questions, write down on the line provided the number that you feel best describes how intense this orgasm was. Please use the following scale:

0 very weak — **1** — **2** — **3** — **4** — **5** very strong

a. During this orgasm, you may have experienced physical sensations throughout your body (e.g., spasms, throbbing, tension). How intense were these physical sensations overall? ____

b. During or after orgasm, you may have experienced other feelings that were more psychological rather than physical (e.g., satisfaction, feelings of peacefulness or relaxation, ecstasy, love). How intense were these nonphysical feelings overall? ____

7. Please indicate below the parts of your body in which you experienced this orgasm by placing an **X** on the line beside the body part that apply. Indicate as many of the body parts as you feel will accurately describe this orgasm. Different people will experience orgasm in many different ways, and so there is no "right" answer. We are only interested in how you experienced this orgasm.

(For women only)

I felt my orgasm in my

___ clitoris
___ vulva (outer genitals)
___ vagina (but near the surface or outer part of it)
___ vagina (deeper inside)
___ uterus
___ whole pelvic area

(For men only)

I felt my orgasm in my

___ penis
___ testes
___ deeper inside, behind my penis/testes
___ whole pelvic area

(For both men and women)

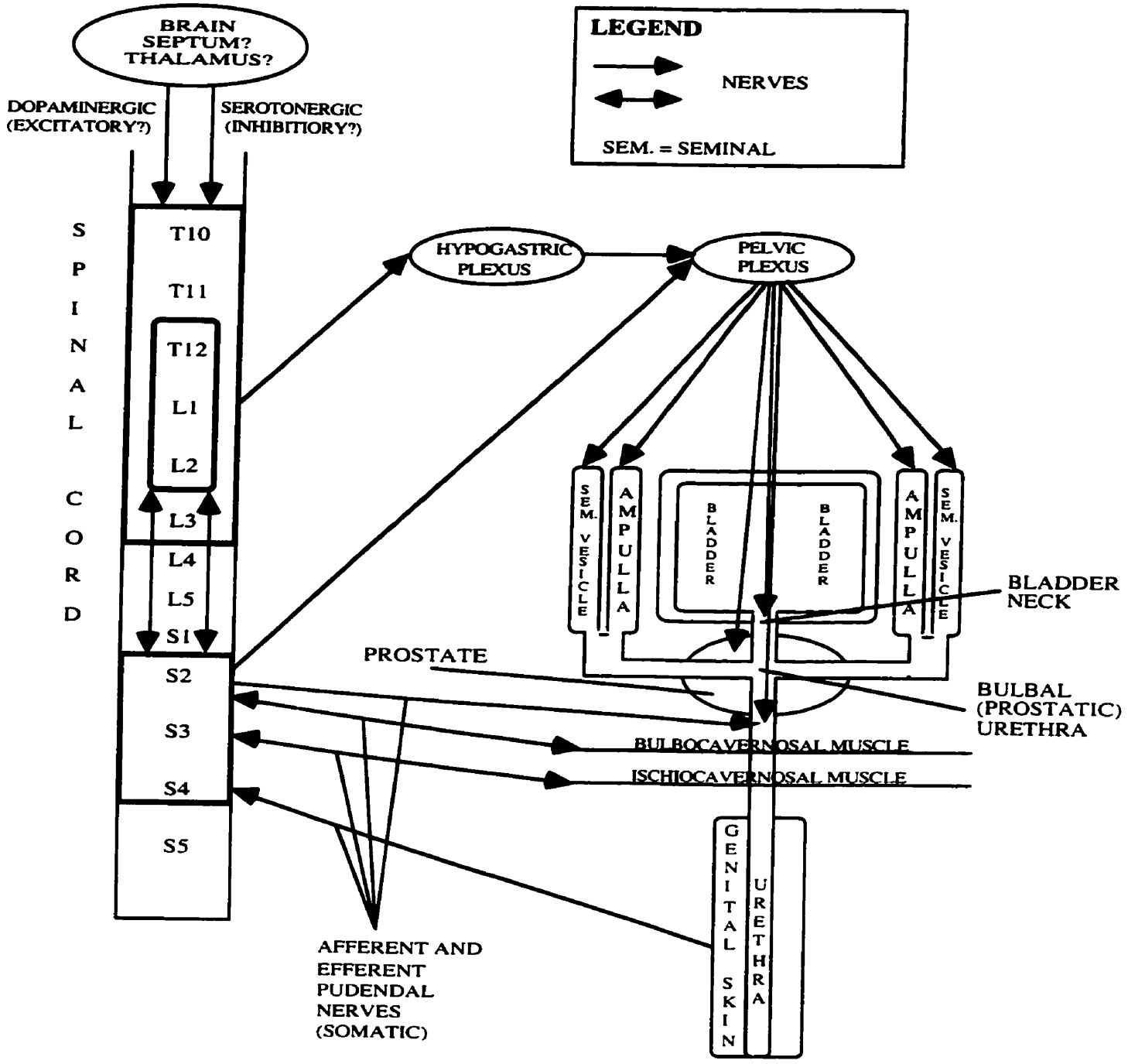
My orgasm feelings

___ centered around my outer genitals (around my clitoris/vulva/ outer vagina, penis/testes) only
___ started in my outer genitals but then spread deeper
___ centered deep inside (my inner vagina/uterus, behind my penis/ testes) only
___ centered in my whole pelvic area only
___ spread to my whole pelvic area
___ centered in other parts of my body (e.g., legs, abdomen) only
___ spread to other parts of my body
___ centered in my whole body
___ spread to my whole body

You have now completed this questionnaire package. Please seal the questionnaire package in the envelope provided and return it according to the instructions on the Information Sheet. Thank you very much for your participation. It is greatly appreciated.

Appendix E

Diagram of Male Genitopelvic System, Spinal Control of Emission and Ejaculation.


BRAIN
SEPTUM?
THALAMUS?
DOPAMINERGIC
(EXCITATORY?)
SEROTONERGIC
(INHIBITORY?)
LEGEND
NERVES
SEM. = SEMINAL
SPINAL CORD
T10
T11
T12
L1
L2
L3
L4
L5
S1
S2
S3
S4
S5
HYPOGASTRIC
PLEXUS
PELVIC
PLEXUS
SEM. VESICLE
AMPULLA
BLADDER
BLADDER
AMPULLA
SEM. VESICLE
BLADDER
NECK
PROSTATE
BULBAL
(PROSTATIC)
URETHRA
BULBOCAVERNOSAL MUSCLE
ISCHIOCAVERNOSAL MUSCLE
GENITAL SKIN
URETHRA
AFFERENT AND
EFFERENT
PUDENDAL
NERVES
(SOMATIC)

Appendix F

Parameter Estimates for Confirmatory Factor Model of the Orgasm Experience for Both Sexes

(Study 1)

Parameter	Unstandardized parameter estimate	SE[1]	Uniqueness	Parameter	Unstandardized parameter estimate	SE[1]	Uniqueness
	women				men		
Regression Coefficients				Regression Coefficients			
1. Building Sensations				1. Building Sensations			
building1	1.00	--	2.50	building1	1.00	--	2.50
swelling1	1.76	0.17	1.32	swelling1	1.48	0.16	1.46
building2	1.18	0.11	1.84	building2	1.17	0.13	1.80
swelling2	2.02	0.22	0.70	swelling2	1.79	0.21	0.96
2. Flooding Sensations				2. Flooding Sensations			
flowing1	1.00	--	1.45	flowing1	1.00	--	1.34
flooding1	1.15	0.07	1.49	flooding1	0.92	0.10	1.77
flowing2	1.07	0.07	1.44	flowing2	1.30	0.11	1.03
flooding2	1.12	0.08	1.38	flooding2	1.14	0.11	1.65
3. Flushing Sensations				3. Flushing Sensations			
flushing1	0.86	0.04	1.79	flushing1	0.86	0.06	1.17
spreading1	0.80	0.07	2.01	spreading1	0.71	0.06	1.41
flushing2	1.00	--	1.41	flushing2	1.00	--	0.91
spreading2	0.90	0.07	1.53	spreading2	0.92	0.06	1.20
4. Spurting Sensations				4. Spurting Sensations			
spurting1	1.00	--	1.25	spurting1	1.00	--	1.58
shooting1	1.28	0.11	1.25	shooting1	1.09	0.09	1.45
spurting2	1.38	0.11	1.26	spurting2	1.24	0.10	1.31
shooting2	1.60	0.14	1.15	shooting2	1.19	0.11	1.26

5. Throbbing Sensations			
pulsating1	1.00	--	1.35
throbbing1	1.19	0.08	1.29
pulsating2	1.00	0.08	1.20
throbbing2	1.16	0.10	1.07
6. General Spasms			
shuddering1	0.90	0.05	1.52
quivering1	0.89	0.06	1.45
trembling1	0.92	0.06	1.41
shuddering2	1.00	--	1.26
quivering2	0.93	0.05	1.13
trembling2	1.01	0.06	1.17
7a. Pleasurable Satisfaction1			
satisfying1	1.00	--	0.47
pleasurable1	0.69	0.08	0.50
fulfilling1	1.22	0.10	0.89
7b. Pleasurable Satisfaction2			
satisfying2	1.00	--	0.40
pleasurable2	0.76	0.06	0.29
fulfilling2	1.08	0.08	0.64
8. Relaxation			
relaxing1	1.00	--	1.61
peaceful1	0.99	0.11	2.02
soothing1	1.06	0.10	1.81
relaxing2	1.24	0.11	1.42
peaceful2	1.36	0.13	1.43
soothing2	1.41	0.13	1.12
9a. Emotional Intimacy1			

5. Throbbing Sensations			
pulsating1	1.00	--	1.72
throbbing1	1.40	0.17	1.50
pulsating2	1.58	0.20	0.98
throbbing2	1.95	0.26	0.83
6. General Spasms			
shuddering1	0.77	0.07	1.52
quivering1	0.89	0.07	1.25
trembling1	0.86	0.07	1.24
shuddering2	1.00	--	1.01
quivering2	1.10	0.06	1.00
trembling2	1.00	0.08	1.30
7a. Pleasurable Satisfaction1			
satisfying1	1.00	--	0.44
pleasurable1	0.69	0.07	0.65
fulfilling1	1.15	0.08	0.80
7b. Pleasurable Satisfaction2			
satisfying2	1.00	--	0.29
pleasurable2	0.87	0.06	0.27
fulfilling2	1.20	0.08	0.63
8. Relaxation			
relaxing1	1.00	--	1.80
peaceful1	1.52	0.22	1.71
soothing1	0.98	0.19	1.59
relaxing2	1.37	0.16	1.24
peaceful2	1.83	0.27	1.54
soothing2	1.74	0.26	0.95
9a. Emotional Intimacy1			

close1	1.00	--	0.67
tender1	1.23	0.14	1.32
loving1	1.61	0.17	0.95
passionate1	1.59	0.17	1.05
unifying	1.37	0.13	1.10
9b. Emotional Intimacy2			
loving2	1.00	--	0.80
tender2	0.90	0.06	1.60
close2	1.04	0.07	2.04
unifying2	0.93	0.07	1.47
10. Ecstasy2			
elated2	1.00	--	1.06
ecstatic2	0.97	0.05	1.13
euphoric2	1.03	0.05	1.00
rapturous2	0.99	0.05	1.24
A. Sensory			
Building Sensations	0.58	0.07	0.24
Flooding Sensations	0.86	0.06	0.37
Flushing Sensations	1.16	0.06	0.20
Spurting Sensations	0.60	0.06	0.36
Throbbing Sensations	0.56	0.06	0.66
General Spasms	0.84	0.06	0.81
B. Evaluative			
Pleasurable Satisfaction1	0.45	0.06	0.54
Pleasurable Satisfaction2	0.54	0.05	0.33
Relaxation	0.57	0.06	0.44
C. Affective			
Emotional Intimacy1	0.30	0.05	0.37

close1	1.00	--	0.58
tender1	1.25	0.13	0.65
loving1	1.29	0.17	0.84
passionate1	1.32	0.18	1.15
unifying	1.23	0.15	1.28
9b. Emotional Intimacy2			
loving2	1.00	--	0.97
tender2	0.87	0.07	1.46
close2	1.06	0.08	1.54
unifying2	1.11	0.07	0.89
10. Ecstasy2			
elated2	1.00	--	0.91
ecstatic2	0.91	0.07	1.28
euphoric2	0.87	0.07	1.38
rapturous2	1.04	0.07	1.01
A. Sensory			
Building Sensations	0.58	0.08	0.23
Flooding Sensations	0.77	0.06	0.31
Flushing Sensations	0.94	0.07	0.76
Spurting Sensations	0.77	0.08	0.45
Throbbing Sensations	0.56	0.08	0.10
General Spasms	0.97	0.07	0.44
B. Evaluative			
Pleasurable Satisfaction1	0.39	0.08	0.91
Pleasurable Satisfaction2	0.42	0.07	0.46
Relaxation	0.50	0.08	0.19
C. Affective			
Emotional Intimacy1	0.40	0.06	0.36

Emotional Intimacy2	0.66	0.07	0.85	Emotional Intimacy2	0.74	0.08	0.96
Ecstasy2	1.09	0.07	0.44	Ecstasy2	1.02	0.08	0.38
Covariances Among Dimensions				Covariances Among Dimensions			
Sensory-Evaluative	0.57	0.05	--	Sensory-Evaluative	0.73	0.07	--
Sensory-Affective	0.78	0.04	--	Sensory-Affective	0.87	0.04	--
Evaluative-Affective	0.85	0.05	--	Evaluative-Affective	0.84	0.06	--

[1] SEs are corrected for nonnormal data.

Appendix G

Parameter Estimates for Confirmatory Factor Model of the Orgasm Experience for All Groups

(Study 2)

Parameter	Unstandardized parameter estimate	SE[1]	Uniqueness	Parameter	Unstandardized parameter estimate	SE[1]	Uniqueness
	female/SolM				male/SolM		
Regression Coefficients				Regression Coefficients			
1. Building Sensations				1. Building Sensations			
building	1.00	--	2.20	building	1.00	--	2.00
swelling	1.15	0.19	1.92	swelling	1.12	0.15	1.29
2. Flooding Sensations				2. Flooding Sensations			
flooding	1.00	--	1.50	flooding	1.00	--	1.49
flowing	0.93	0.11	1.26	flowing	0.86	0.11	1.48
3. Flushing Sensations				3. Flushing Sensations			
flushing	1.00	--	2.12	flushing	1.00	--	0.99
spreading	1.20	0.20	2.02	spreading	0.77	0.16	1.78
4. Spurting Sensations				4. Spurting Sensations			
shooting	1.00	--	1.06	shooting	1.00	--	1.19
spurting	0.91	0.13	1.42	spurting	0.96	0.15	1.13
5. Throbbing Sensations				5. Throbbing Sensations			
pulsating	--	--	1.17	pulsating	1.00	--	1.23
throbbing	1.42	0.26	1.32	throbbing	1.02	0.13	0.97
6. General Spasms				6. General Spasms			
shuddering	1.00	--	1.36	shuddering	1.00	--	1.25
quivering	1.00	0.09	1.06	quivering	1.01	0.09	1.08

trembling	1.02	0.08	0.89
7. Pleasurable Satisfaction			
satisfying	1.00	--	0.43
pleasurable	0.78	0.10	0.59
fulfilling	1.21	0.15	0.89
8. Relaxation			
relaxing	1.00	--	0.72
peaceful	1.05	0.08	1.11
soothing	1.05	0.08	0.99
9. Emotional Intimacy			
loving	1.37	0.07	0.83
tender	1.12	0.08	1.02
close	0.95	0.10	1.36
passionate	1.36	0.08	1.29
unifying	1.12	0.10	1.36
A. Sensory			
Building Sensations	0.75	0.12	0.21
Flooding Sensations	1.01	0.10	0.37
Flushing Sensations	0.82	0.11	0.01
Spurting Sensations	0.82	0.09	0.52
Throbbing Sensations	0.57	0.11	0.41
General Spasms	0.74	0.11	1.27
B. Evaluative			
Pleasurable Satisfaction	0.81	0.12	0.08
Relaxation	0.63	0.11	1.21
Covariances Among Dimensions			

trembling	0.98	0.11	1.09
7. Pleasurable Satisfaction			
satisfying	1.00	--	0.72
pleasurable	0.77	0.30	0.75
fulfilling	1.89	0.54	0.42
8. Relaxation			
relaxing	1.00	--	0.98
peaceful	1.16	0.23	1.32
soothing	1.14	0.20	0.87
9. Emotional Intimacy			
loving	1.30	0.11	1.05
tender	1.16	0.10	0.71
close	0.96	0.12	1.04
passionate	1.29	0.10	1.07
unifying	1.15	0.11	0.96
A. Sensory			
Building Sensations	0.99	0.13	0.08
Flooding Sensations	1.11	0.11	0.22
Flushing Sensations	0.98	0.11	0.39
Spurting Sensations	0.94	0.13	0.52
Throbbing Sensations	0.94	0.13	0.42
General Spasms	1.07	0.11	0.36
B. Evaluative			
Pleasurable Satisfaction	0.48	0.14	0.10
Relaxation	0.59	0.13	0.56
Covariances Among Dimensions			

Sensory-Evaluative	0.52	0.10	--
Sensory-Emotional Intimacy	0.45	0.07	--
Evaluative-Emotional Intimacy	0.47	0.08	--

Sensory-Evaluative	0.48	0.09	--
Sensory-Emotional Intimacy	0.48	0.09	--
Evaluative-Emotional Intimacy	0.59	0.13	--

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female/SexP

Regression Coefficients

1. Building Sensations			
building	1.00	--	2.27
swelling	1.38	0.21	1.46
2. Flooding Sensations			
flooding	1.00	--	2.15
flowing	1.19	0.16	1.30
3. Flushing Sensations			
flushing	1.00	--	2.29
spreading	1.03	0.19	1.99
4. Spurting Sensations			
shooting	1.00	--	1.04
spurting	0.83	0.11	1.58
5. Throbbing Sensations			
pulsating	1.00	--	1.21
throbbing	1.20	0.17	1.40
6. General Spasms			

male/SexP

Regression Coefficients

1. Building Sensations			
building	1.00	--	2.24
swelling	1.70	0.35	1.24
2. Flooding Sensations			
flooding	1.00	--	1.79
flowing	0.90	0.14	1.62
3. Flushing Sensations			
flushing	1.00	--	1.73
spreading	1.32	0.23	1.28
4. Spurting Sensations			
shooting	1.00	--	0.99
spurting	0.75	0.08	1.70
5. Throbbing Sensations			
pulsating	1.00	--	1.55
throbbing	1.32	0.24	1.18
6. General Spasms			

shuddering	1.00	--	1.70
quivering	1.04	0.09	1.11
trembling	0.98	0.11	1.17
7. Pleasurable Satisfaction			
satisfying	1.00	--	0.67
pleasurable	0.75	0.18	0.60
fulfilling	1.61	0.23	0.72
8. Relaxation			
relaxing	1.00	--	1.13
peaceful	1.02	0.06	0.82
soothing	0.97	0.07	0.92
9. Emotional Intimacy			
loving	1.00	--	1.00
tender	0.78	0.07	1.07
close	0.99	0.07	1.28
passionate	0.52	0.08	0.92
unifying	0.97	0.07	1.51
10. Ecstasy			
ecstatic	1.00	--	1.32
elated	1.05	0.12	1.34
euphoric	0.92	0.12	1.11
rapturous	1.14	0.12	1.53
A. Sensory			
Building Sensations	0.74	0.11	0.17
Flooding Sensations	0.89	0.11	0.31
Flushing Sensations	0.76	0.11	0.01
Spurting Sensations	0.86	0.09	0.71
Throbbing Sensations	0.71	0.10	0.52
General Spasms	0.70	0.09	0.95

shuddering	1.00	--	1.22
quivering	0.89	0.09	1.25
trembling	1.00	0.09	1.08
7. Pleasurable Satisfaction			
satisfying	1.00	--	0.79
pleasurable	1.09	0.31	0.51
fulfilling	1.45	0.37	0.56
8. Relaxation			
relaxing	1.00	--	1.13
peaceful	1.08	0.10	0.99
soothing	0.97	0.09	0.96
9. Emotional Intimacy			
loving	1.00	--	0.85
tender	0.56	0.09	1.03
close	0.91	0.07	1.03
passionate	0.76	0.08	1.02
unifying	1.00	0.07	1.14
10. Ecstasy			
ecstatic	1.00	--	1.17
elated	0.97	0.13	1.34
euphoric	0.92	0.13	1.08
rapturous	1.04	0.12	1.13
A. Sensory			
Building Sensations	0.64	0.13	0.17
Flooding Sensations	0.89	0.11	0.09
Flushing Sensations	0.81	0.12	0.18
Spurting Sensations	1.24	0.11	0.39
Throbbing Sensations	0.74	0.13	0.15
General Spasms	1.05	0.11	0.45

B. Evaluative				B. Evaluative			
Pleasurable Satisfaction	0.51	0.09	0.07	Pleasurable Satisfaction	0.61	0.16	0.03
Relaxation	0.61	0.09	1.63	Relaxation	0.64	0.14	1.34
C. Affective				C. Affective			
Emotional Intimacy	0.80	0.10	1.27	Emotional Intimacy	0.65	0.15	1.59
Ecstasy	0.89	0.10	0.19	Ecstasy	0.98	0.15	0.21
Covariances Among Dimensions				Covariances Among Dimensions			
Sensory-Evaluative	0.42	0.08	--	Sensory-Evaluative	0.38	0.12	--
Sensory-Affective	0.57	0.07	--	Sensory-Affective	0.73	0.10	--
Evaluative-Affective	0.96	0.09	--	Evaluative-Affective	0.65	0.11	--

[1]SEs are corrected for nonnormal data.