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Note

Reports of intimate touch: Erogenous zones and somatosensory cortical organization

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ABSTRACT

Introduction: Erogenous zones have paradoxical response properties, producing erotic feelings from body surfaces distant from the genitalia. Ramachandran has suggested an intriguing neuroscientific explanation for the distribution of erogenous zones, based on the arrangement of body parts (such as the adjacent positioning of the genitals and the feet) in primary somatosensory cortex (S1). The present study represents the first systematic survey of the magnitude of erotic sensations from various body parts, as well as the first empirical investigation of the S1 theory of erogenous zones, by analysis of whether evaluations of erogenous magnitude from adjacent S1 sites tend to correlate.

Methods: A sample of some 800 participants, primarily from the British Isles and Sub-Saharan Africa, completed a survey of 41 body parts, each rated for erogenous intensity.

Results: Ratings for the feet were surprisingly low. However, there were remarkable levels of correlation between ratings of intensity, regardless of the age, sexual orientation, nationality, race and, more surprisingly, the sex of our participant sample (R^2 values ranging between .90 and .98). Multiple regression and factor analysis investigated whether body parts nearby in S1 were significantly correlated.

Conclusion: The S1 hypothesis appears to lack support, because of the low level of foot ratings, the lack of inter-correlation between ratings for nearby S1 sites, and the previous literature suggesting that cortical stimulation of S1 does not appear to be erotogenic. The consistency across demographic variables is open to multiple interpretations. However, it may be that individual experience or cultural differences (a starting point for some accounts of erogenous zone distribution) are not substantial determining variables. Thus, while S1 does not appear to be the likely site that would support Ramachandran's neural body map proposal, we suggest that the origins of erogenous distribution may derive from a map located *elsewhere* in the brain.

1. Introduction

Erogenous zones have long been a topic of interest, by virtue of their paradoxical response properties: erotic sensations derived from body surfaces (e.g., neck) which have no special connection to the genitalia. There has been substantial interest in the topic in the popular media (Fulbright, 2007, pp. xvii–xviii; Martin, 2009). However, there appears to have

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been little *scientific* interest in their paradoxical response properties.

An intriguing neuroscientific explanation for the distribution of erogenous zones was proposed in the 1990s, based on the arrangement of body parts in primary somatosensory cortex (S1). Ramachandran & Blakeslee (1998, pp. 35–36) suggested that activation of body parts *adjacent* to genital zones in S1 may produce *partial* activation of the areas for genital representation – producing low level erotic sensation. Notably, several upper body areas (e.g., neck, ear, etc.) lie adjacent to the breast in (lateral) S1, and Ramachandran argued that lower body parts, especially the feet, lie close to the cortical mapping for the genitals in (medial) S1.

In favour of this argument, there is also evidence that the body part boundaries in S1 can be dynamic and even 'fuzzy', with many reports of plasticity in S1, including changes following practise or sensory restriction (e.g., Buonomano & Merzenich, 1998; Candia, Wienbruch, Elbert, Rockstroh, & Ray, 2003; Donoghue, 1995), or changes as part of the phantom limb phenomenon (Berlucchi & Aglioti, 1997; Elbert et al., 1994; Flor et al., 1998, 2006; Halligan, Zeman, & Berger, 1999; Karl, Birbaumer, Lutzenburger, Cohen, & Flor, 2001). A related observation has been suggested in relation to the feeling or belief that ones' own limb(s) are foreign to the body, sometimes referred to as body integrity identity disorder, foreign limb syndrome, or xenomelia (Hilti et al., 2013, p. 7; McGeoch et al., 2011).

However, these findings also have a controversial element, especially in relation to the mapping of the genitalia onto the cortical homunculus (Blakeslee & Blakeslee, 2008; Bradley, Farrell, & Ojemann, 1998; Georgiadis & Holstege, 2005; Georgiadis et al., 2006; Kell, von Kriegstein, Rösler, Kleinschmidt, & Laufs, 2005; Komisaruk et al., 2011; Michels, Mehnert, Boy, Schurch, & Kollias, 2010; Penfield & Boldrey, 1937; Penfield & Rasmussen, 1950; Schott, 1993). There is a growing understanding of the complexity of primary somatosensory representation of the genitalia in both males (Holstege et al., 2003; Kell et al., 2005) and females (Komisaruk et al., 2011; Michels et al., 2010), together with imaging findings on sexual arousal and orgasm (Georgiadis, Reinders, Paans, Renken, & Kortekaas, 2009; Holstege et al., 2003).

In this context, it seems appropriate to consider whether the various strands of evidence for the S1 theory are robust. There are several such lines of evidence.

1.1. *Cortical stimulation*

One source of information is whether these proposed S1-generated sensations are genuinely *erotic*. There have long been reports of direct cortical stimulation of S1 (Foerester & Penfield, 1930; Penfield & Boldrey, 1937; Penfield & Jasper, 1954; Penfield & Kristiansen, 1951; Penfield & Rasmussen, 1950). However, these reports do not appear to have an erotic element. Electrical stimulation of S1 appears to produce general sensations of "tingling or numbness" (Penfield & Rasmussen, 1950, p. 26) and this also applies to stimulation of genital S1. For example, Penfield and Rasmussen's (1950) patient reported seizure-related sensation in both the labia and the nipple, deriving from the right post-central gyrus, but reported "nothing in the sensation that resembled sexual excitement" (1950, p. 26). Indeed, even after several decades of cortical stimulation work (with approximately 400 patients) Penfield and Rasmussen reported that "Curiously enough, we have never produced *erotic sensations* of any sort by [electrical] stimulation [of the cortex]" [p. 26 (italics as in the original), also see Penfield & Kristiansen, 1951, or Di Noto, Newman, Wall, & Einstien, 2013, p. 1006 for a modern referencing of this literature]. These reports were derived in a clinical setting, but nonetheless do suggest that primary somatosensory cortex does not appear to be a source of powerful erogenous stimulation.

1.2. *Phantom phenomena*

There have been a few case reports in the scientific literature which address the S1 theory from the perspective of phantom limb: a phenomenon known to be related to S1 plasticity (Flor et al., 1998; Flor, Nikolajsen, & Jensen, 2006; Kew et al., 1997; Medina & Coslett, 2010; Ramachandran & Hirstein, 1998). Aglioti, Cortese, and Franchini (1994) report that stimulation of the ear-lobe frequently produced sensation in the phantom nipple after mastectomy, with related accounts after orchiectomy reported by Weinstein, Sersen, and Vetter (1968). Notably, while these patients reported phantom breast or testicle sensation, in neither case was the sensation erotic. Again, these data do not support the S1 claim.

1.3. *The feet as erogenous zones*

In the original S1 account, much was made of the fact that the genitals and feet were adjacent (Ramachandran & Blakeslee, 1998). Notably, there is a literature (e.g., Scorolli, Ghirlanda, Enquist, Zattoni, & Jannini, 2007) demonstrating that the lower limbs are of especial erotic interest. For example, the feet, and items associated with the feet (shoes, stockings etc.), constitute almost *half* of all body part fetishes (47%, Scorolli et al., 2007, p. 435). However, fetishes are *non*-somatic sources of pleasure – a typically visual form of desire derived from objects *external* to the body. Such erotic links are presumably mediated by visual (rather than somatosensory) systems, again running counter to the Ramachandran proposal.

This begs the question of whether there are studies of the distribution of erogenous zones (i.e., based on somatic touch) in the neurologically-normal. However, there is a striking absence of empirical research in this area, and it appears that no systematic survey of the magnitude of preferred erotic sensations from various body parts has *ever* been published. The most thorough investigation of erogenous experience is that of Kinsey, Pomeroy, and Martin (1953a) and Kinsey, Pomeroy, Martin, and Gebhard (1953b), which contains 521 possible interview questions, but did not request systematic erogenous ratings of individual body parts – (see also Albright, 2006; Scherer Brewer, 1985). There have been other opportunities for systematic survey of erogenous zones (Levin & Meston, 2006; Masters & Johnson, 1966; Schofield, 1967), but no scientific study appears to have collected the appropriate data.

To investigate this, the present study reports findings from a total sample of some 800 participants, allowing us to investigate demographic variables in the distribution of

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erogenous zones, and to produce an empirically-based investigation of the S1 theory.

2. Methods

2.1. Participants and measures

Data were collected using an online Erogenous Zone Questionnaire consisting of a biographical survey, and a scale on which participants rated, in terms of level of arousal, the ability of 41 different body areas[1] to facilitate sexual arousal. The scale was 0–10, where 'no' was scored as zero, and 10 represented the highest stimulatory capacity.

Data from 793 questionnaires were included in the sample. Participants were excluded from data analysis if they did not fully complete all items on the questionnaire, by failing to give their age (four participants) or demographic information (two participants). Those who completed scores for *both* male and female genitalia were also excluded from the sample (three participants) on the assumption that they had not understood the instructions. Participation was open to individuals regardless of their sex, age (with a lower boundary of 19 years), race and sexual orientation. Participants were recruited through portal sites at the University of the Witwatersrand (South Africa) and from Bangor University (United Kingdom). Participants from other locations also accessed the public site, which was advertised through social networking websites. IP addresses were not tracked.

2.2. Demographic information

The final sample consisted of 304 men and 489 females. The mean participant age was 24.7 years old [standard deviation (SD) = 6.4]. The majority of participants originated from the British Isles (33.2%) or Sub-Saharan Africa (53.6%). The other 33 countries were represented at less than 4.0% each. The majority of participants self-reported as white (82.3%) or black (9.6%) with other ethnicities reported at levels of 2.5% or lower. Sexual orientation was reported by 94.7% of participants, who self-classified as heterosexual (84%), homosexual (4.8%) and bisexual (5.9%).

2.3. Data analysis

Correlational analyses explored similarities amongst different demographic groups, for all body part arousal ratings. Multiple regression analyses explored possible predictors of genital arousal scores. Forced entry regressions with all variables (for each sex), initially entered together with the default removal probability of $p > .10$, were used in SPSS v17. Factor analyses explored whether body part arousal scores clustered into specific groups.

[1] The 41 body parts were reported in approximate 'body height' order, and consisted of: *Front of Body*: forehead, eye and temple, nose, cheeks, mouth/lips, ears, front of neck, shoulders, elbows, wrists, hands, fingers, breast, chest, nipples, stomach, sides, bellybutton, pubic hairline, hips, clitoris, vagina, penis, scrotum, perineum (listed with an explanatory note specifying 'area between genitals and anus'), inner thighs, outer thighs, knee caps, ankles, foot, and toes. *Back of Body*: head and hair, back of neck, shoulder blades, upper back, lower back, buttocks, back of thighs, behind the knees, and calves/back of shins.

3. Results

3.1. Analysis 1: magnitude of erogenous report

Each participant gave an erogenous rating for each body part, ranging from 0 to 10. The highest rated body parts (regardless of demographic variables) can be seen in Table 1.

Demographic correlations are reported in Fig. 1. In each case the figure shows the *actual* trend-line for the graph (solid line), and an 'ideal' correlation that would be seen if the two samples

Table 1 – Overall body parts scores (highest first) for all participants and males and females reported separately (mean scores are given).

Females			Males		
	Mean	SD		Mean	SD
Clitoris	9.17	2.12	Penis	9.00	2.50
Vagina	8.40	2.35	Mouth/lips	7.03	2.68
Mouth/lips	7.91	2.27	Scrotum	6.50	3.72
Nape of neck	7.51	2.70	Inner thigh	5.84	3.39
Breasts	7.35	2.73	Nape of neck	5.65	3.50
Nipples	7.35	3.15	Nipples	4.89	3.79
Inner thigh	6.70	2.99	Perineum	4.81	4.10
Back of neck	6.20	3.15	Pubic hairline	4.80	3.82
Ears	5.06	3.40	Back of neck	4.53	3.42
Lower back	4.73	3.38	Ears	4.30	3.50
Pubic hairline	4.72	3.90	Chest	4.14	3.47
Buttocks	4.53	3.45	Buttocks	4.06	3.56
Head & hair	4.14	3.42	Head & hair	3.53	3.39
Stomach	3.97	3.55	Stomach	3.01	3.54
Hips	3.57	3.58	Lower back	2.86	3.44
Sides	3.50	3.56	Hands	2.83	3.17
Shoulders	3.27	3.40	Sides	2.83	3.39
Perineum	3.01	3.82	Fingers	2.76	3.42
Upper back	2.98	3.45	Back of thigh	2.48	3.26
Hands	2.73	3.10	Hips	2.31	3.30
Back of thigh	2.60	3.27	Upper back	2.22	3.10
Shoulder blades	2.36	3.23	Shoulders	1.96	2.64
Fingers	2.34	3.21	Outer thigh	1.91	2.88
Outer thigh	1.96	2.95	Cheeks	1.65	2.65
Wrists	1.86	2.78	Bellybutton	1.60	2.91
Behind knee	1.70	3.00	Shoulder blades	1.45	2.64
Cheeks	1.65	2.59	Behind knee	1.40	2.68
Bellybutton	1.62	3.00	Foot	1.34	2.57
Foot	1.32	2.52	Upper arms	1.30	2.45
Eye and temple	1.24	2.44	Eye and temple	1.22	2.46
Upper arms	1.15	2.36	Toes	1.00	2.33
Forearm	.93	2.07	Wrists	.99	2.17
Toes	.85	2.19	Forearm	.97	2.11
Forehead	.85	2.04	Chin	.63	1.88
Calves	.57	1.78	Calves	.62	1.91
Chin	.55	1.74	Ankles	.47	1.57
Ankles	.54	1.61	Forehead	.46	1.61
Knee caps	.44	1.59	Nose	.36	1.30
Shin	.29	1.23	Knee caps	.32	1.31
Nose	.24	1.03	Elbow	.22	1.08
Elbow	.16	.90	Shin	.20	1.02

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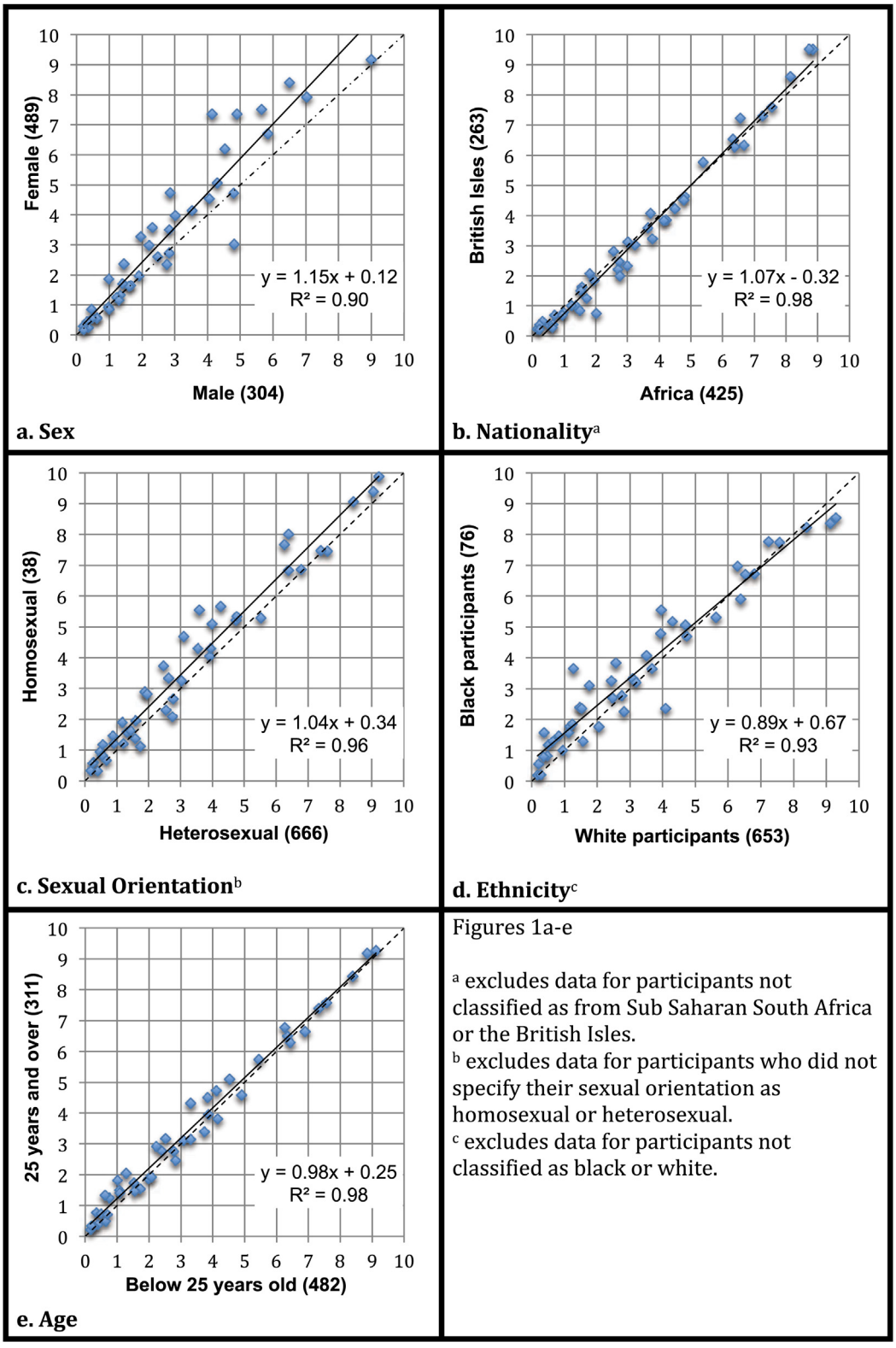

Figures 1a-e

[a] excludes data for participants not classified as from Sub Saharan South Africa or the British Isles.
[b] excludes data for participants who did not specify their sexual orientation as homosexual or heterosexual.
[c] excludes data for participants not classified as black or white.

Fig. 1 – (a–e): The correlations of mean scores for each body part, by sex, nationality, sexual orientation, ethnicity and age (sample size is given in parentheses).

were identically related (dotted line). In each case, the correlation data were based on the mean score for a *particular* group (e.g., British Isles *vs* Africa etc.), for each of the body parts. For example in Fig. 1a the scores for nape of neck are 7.51 (female) and 5.65 (male). Notably, the mean ratings for the feet (and other lower extremity parts) are below 2/10, and in most cases

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below 1/10 (see Table 1). Indeed, 75% of participants (595) rated the feet at 0, and only 6% rated the feet above 7.

Correlations identified that variability ranged between R^2 values of .90 (sex) and .98 (nationality and age). All were highly significant ($p < .001$).[2] Gradient values ranged from .89 (ethnicity) to 1.15 (sex), while the slope values varied from .12 (sex) to .67 (ethnicity).

Men appear to have a very similar distribution of intensity of erogenous zones to that of women (see Fig. 1a), with a male:female R^2 value of .90. This effect was derived primarily from similarities at the higher and lower range of intensities. In the moderate intensity range, the ratings were substantially higher for females: back of neck (6.2 female, 4.5 male – 37% higher for females), breast/chest (7.4 female, 4.1 male – 78%), nipples (7.4 female, 4.9 male – 50%) and nape of neck (7.5 female, 5.7 male – 33%). To re-cast these data, women rated *six* body parts at scores of 7 or higher, while men rated only *two* at this level (see Table 1). Thus the claim that women have a much greater number of erogenous zones at higher intensity has at least some basis. Between group analysis of variance revealed a significant difference in ratings given by men and women $F_{(1,23.21)} = 17.85$, $p < .001$ (Greenhouse–Geisser corrected). Post hocs revealed (Bonferroni corrected) that women rate back and nape of neck, hips, inner thigh, mouth/lips, nipples, shoulder blades, shoulders, stomach, and wrists significantly higher than men ($p < .001$). Men rated only one body part, the perineum, significantly higher than women ($p < .001$).

3.2. *Analysis 2: investigating the S1 hypothesis*

Multiple regressions (forced entry), involving scores for all body parts, demonstrated that the significant predictors of *penis* arousal scores were mouth/lips, scrotum, stomach and inner thighs ($F_{40,262} = 5.09$, $p < .001$, $R^2_a = .35$). In females, the significant predictors of *clitoris* arousal scores were inner thigh, nape of neck, nipples, vagina, bellybutton, breasts, perineum and shoulders ($F_{40,448} = 14.22$, $p < .001$, $R^2_a = .52$). The individual beta and p values for the predictors in both of the analyses can be seen in Tables 2 and 3. Notably, in the context of the S1 theory, the foot does not appear as a significant predictor.

Factor analysis: Principal component analysis (PCA) was conducted on the 41 body parts with orthogonal rotation (varimax) for each sex. Both the Kaiser–Meyer–Olkin (KMO) measure (males: KMO = .88; females: KMO = .90) and Bartlett's test of sphericity [males (820) = 5115.7, $p < .001$ and females (820) = 6807.0, $p < .001$] were within acceptable limits. For both males and females, 10 items had eigenvalues of Kaiser criteria of 1, but the scree plot showed inflections that would justify retaining three components, accounting for 39.1% of variance for males, and 35.8% for females. When an item appeared in two components, it was assigned to the component with which it had the highest loading (see Tables 4 and 5).

[2] In Fig. 1a the data for clitoris/penis, vagina/scrotum, and breast/chest were combined. An additional set of analyses were run excluding these three pairs of body parts, with very little difference in results. R^2 values remained broadly similar (sex = .89, nationality = .97, sexual orientation = .93, ethnicity = .89, and age = .97).

Table 2 – The beta and *p* values for the regression analysis using all male body parts. The significant predictors for penis are shown below.

	Penis		
	B	*t*	*p*
Inner thigh	.190	2.711	.007
Mouth/lips	.346	5.549	.000
Scrotum	.316	5.083	.000
Stomach	−.195	−2.982	.003
The other 36 body parts were not predictive in either analysis.			

The three factors appear to map onto three distinct areas on the body. Component 1 appears to relate to the genitals and highly rated erogenous zones (including nape of neck, ears, buttocks, inner thigh and mouth). Component 2 appears to represent head, trunk, and some non-erogenous extremities. Component 3 appears to represent the body periphery, especially the limbs (including bellybutton). Notably, in the context of the S1 theory, the foot does not appear in the highly rated erogenous zones of Component 1.

4. Discussion

The present study appears to be the first quantitative and systematic scientific investigation of erogenous zones, and opens up a number of avenues of investigation into topics that have long been ignored.

The present study suggests that men appear to have effectively the same distribution of erogenous zones found in women, but for women, several body parts are rated at significantly higher levels of intensity. This effect may be related to higher reports of sensitivity to touch by women in other domains (e.g., vibro-tactile sensitivity, Gescheider, Bolanowski, Hall, Hoffman, & Verrillo, 1994; for a review of the pain literature see Fillingim & Maixner, 1995). Thus, the basis for the claim that women have a greater diversity of erogenous zones seems in part unjustified. Women clearly experience higher erotic intensity for *some* body parts, but this effect appears to have been exaggerated in the popular media.

Table 3 – The beta and *p* values for the regression analysis, using all female body parts. The significant predictors for clitoris are shown below.

	Clitoris		
	B	*t*	*p*
Bellybutton	−.133	−3.460	.001
Breasts	−.135	−2.770	.006
Inner thigh	.176	4.180	.000
Nape of neck	.166	3.849	.000
Nipples	.182	4.092	.000
Perineum	.097	2.688	.007
Shoulders	−.110	−2.709	.007
Vagina	.519	12.649	.000
The other 32 body parts were not predictive in either analysis.			

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Table 4 – Factor loadings after rotation for all 41 male body parts (rotation converged in seven iterations).

Body parts	Component		
	1	2	3
Inner thighs	.739		
Scrotum	.720		
Perineum	.658		
Penis	.611		
Pubic hairline	.563		
Mouth/lips	.538		
Nipples	.537		
Buttocks	.520		
Nape of neck	.515		
Ears	.512		
Back of thighs	.481		
Upper back		.610	
Hands		.600	
Shoulders		.550	
Cheeks		.546	
Head and hair		.544	
Shoulder blades		.531	
Eye and temple		.520	
Stomach		.517	
Back of neck		.510	
Sides		.509	
Lower back		.500	
Chest		.485	
Fingers		.443	
Chin		.426	
Hips		.417	
Forehead		.403	
Outer thighs		.395	
Ankles			.666
Knee caps			.638
Shin			.594
Foot			.593
Toes			.580
Wrists			.524
Calves/back of shins			.522
Elbows			.516
Behind knees			.504
Forearm			.487
Upper arm			.484
Nose			.430
Bellybutton			.401

Table 5 – Factor loadings after rotation for all 41 female body parts (rotation converged in seven iterations).

Body part	Component		
	1	2	3[a]
Vagina	.759		
Nipples	.734		
Breasts	.726		
Clitoris	.716		
Mouth/lips	.595		
Inner thighs	.594		
Nape of neck	.499		
Pubic hairline	.458		
Buttocks	.391		
Ears	.360		
Perineum	.344		
Shoulder blades		.698	
Shoulders		.673	
Upper back		.601	
Back of neck		.587	
Head and hair		.529	
Lower back		.503	
Sides		.481	
Hips		.472	
Hands		.467	
Fingers		.420	
Stomach		.393	
Cheeks		.378	
Wrists		.344	
Eye and temple		.316	
Forehead			
Ankles			.685
Calves/back of shins			.621
Behind knees			.611
Foot			.598
Toes			.564
Knee caps			.555
Shin			.521
Elbows			.511
Upper arm			.490
Back of thighs			.480
Outer thighs			.457
Bellybutton			.442
Chin			.424
Forearm			.402
Nose			

a For ease of discussion in the text Components 1 and 3 in the above table were switched.

4.1. *Nature/nurture effects?*

A further important issue is whether the distribution of erogenous zones might be determined by early developmental (perhaps *in utero*) factors, or whether it is the result of later developmental effects, including the influence of cultural variables or individual differences in life experience. The traditional approach to investigating such nature/nurture issues has been whether there is cross-cultural variation in a given phenomenon (McCall, 1981; Plomin, Fulker, Corley, & DeFries, 1997; Rutter, 2006).

The present finding of high correlations across a range of demographic variables is open to multiple interpretations. These data may well suggest that the factors that determine the intensity of erogenous zones are not greatly influenced by individual life experiences and/or culture, though we acknowledge that further work would be required (e.g., as regards age range and cultural diversity) for this to be conclusive. However, our provisional hypothesis is that the distribution of erogenous zones is likely to be the result of early developing neurobiological variables (cf. Farah, 1998).

4.2. *Somatosensory (S1) theory of erogenous zones*

As reviewed above, it appears that neither direct cortical stimulation of S1, nor the 'phantom limb' effects known to be meditated by S1, appear to produce erotic sensation. In addition, our survey suggests that the foot (near to the genitals in S1) is not a source of somatic pleasure (it ranked at 0 for some

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75% of participants). Notably, lower limb ratings did not predict genital arousal scores, nor did foot ratings cluster together with genital body parts. Viewed in the round, we suggest that the S1 theory of erogenous zones does not appear to be accurate, though (as discussed above) the foot does appear to be a powerful source of *external* (visual?) pleasure for some, as a fetish object.

Instead, the cross-demographic consistency of these data may suggest a neurobiological origin for the distribution of erogenous zones, perhaps based on *some* form of neural 'body map', where map-proximity predicts the distribution of erogenous zones. While S1 does not appear to be the likely source of such a body map, the origins of erogenous distribution may derive from a map located *elsewhere* in the brain (see Gazzola et al., 2012, for some potentially related findings).

A likely shortlist must surely focus on brain areas linking emotion and somatosensory maps. One possibility might be the thalamic-level somatosensory map (Fox, Glazewski, & Schulze, 2000; Yamada et al., 2007), that lies close to hypothalamic systems involved in sexual arousal (Arnow et al., 2002; Ferretti et al., 2005). However, these structures are not directly adjacent.

A more likely candidate might be in the brainstem, where peri-aqueductal gray (PAG) structures, known to be involved in powerful emotion (Damasio et al., 2000; Panksepp, 1998) and sexual experience (Holstege et al., 2003), lie directly adjacent to multimodal areas of the superior colliculus (SC), including a topographical somatosensory map in the deeper layers of SC (Meredith, Clemo, & Stein, 1991; Stein, Magalhães-Castro, & Kruger, 1976) which shows an early developmental trajectory (Benedetti, 1991). However, there is little current evidence that this somatosensory map can be influenced by erogenous touch.

Perhaps the most likely possibility is the insula, increasingly well-known as a site for both emotional and multisensory integration (Craig, 2002, 2009, 2011, though cf. Damasio, Damasio, & Tranel, 2013). Notably, there is clear evidence that the insula is especially activated (Olausson et al., 2002) by unmyelinated low-threshold mechanoreceptors (C tactile, or CT afferents), which are selectively tuned for slow-paced light touch, of the sort found in affiliative and erotic settings (see Olausson, Wessberg, Morrison, McGlone, & Vallbo, 2010 for review). This finding is backed by data from the electrical stimulation of the insula of the macaque (Caruana, Jezzini, Sbriscia-Fioretti, Rizzolatti, & Gallese, 2011), suggesting a role in affiliative behaviours, though other stimulation work has produced subjective reports that were not explicitly erotogenic (Ostrowsky et al., 2002). Nevertheless, the insula appears to offer the linking of brain systems known to be involved in emotion, coupled with a somatosensory map, and indeed a site which is activated by precisely the sort of touch that is known to underpin erogenous experience.

These are, of course, speculative possibilities. However, regardless of the detail of these suggestions, the neurobiology of erogenous zones represents a fascinating and under-investigated scientific question, which now appears to be within the grasp of modern neuropsychology, and is clearly a topic that will repay future research.

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